Modules in Agricultural Education for Agricultural Production.


Jun 74

839p.; For related documents see CE 007 550, CE 008 147-148, CE 008 151, CE 009 326-328, ED 105 080 (Modular Design Approach for Agricultural Education), and ED 105 296 (Module Directory for Agricultural Education); Not available in hard copy due to print quality of original.

EDRS PRICE

MF-$1.50 Plus Postage. HC Not Available from EDRS.

DESCRIPTORS

Agribusiness; *Agricultural Education; *Agricultural Production; Agricultural Skills; Animal Science; Instructional Materials; Learning Modules; Plant Science; Skill Development; *Vocational Agriculture

ABSTRACT

Each of the 61 modules in this packet contains a brief description of the module contents, a list of the major division of units, the overall objectives, objectives by units, content outline, and suggested teaching method, student application activities, and evaluation procedures. A list of resource materials is also included for each. Some of the module titles are Producing Quality Milk; Dairy Cattle Breeding; Dairy Health and Disease; Beef Production; Handling the Foal; Harness Training of Horses; Swine Production; Sheep Production; Poultry Production; Selecting and Handling Dogs and Cats; Care of Birds; Care and Maintenance of Tropical Fish; Care and Handling of Reptiles and Amphibians; Care and Handling of Small Animals; Handling of Primates; Internal and External Parasites of Animals; Sterilization, Disinfection and Sterile Packs; Repair of Equipment; Care and Growing of Insects; Planning a Breeding Program (Livestock); Planning the Cropping Program; and Harvesting the Crop. (HD)
agricultural production

The University of the State of New York
THE STATE EDUCATION DEPARTMENT
Bureau of Occupational and Career Curriculum
Albany, New York 12234
Title: PRODUCING QUALITY MILK

Code: 01.01010101-01

DESCRIPTION:

Students will develop skills needed to produce high quality fluid milk for consumption.

Emphasis will be given to the detection and control of factors which affect milk quality, proper procedure for milking cows, interpretation of milk quality tests, and compliance with herd health regulations.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocations</th>
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<tbody>
<tr>
<td>Class</td>
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<tr>
<td>1. Factors Affecting Milk Quality</td>
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<tr>
<td>2. Proper Milking Procedure</td>
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<tr>
<td>3. Planning to Produce Quality Milk</td>
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<td>Revised June 1974</td>
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</tbody>
</table>
MODULE OF INSTRUCTION

Title - PRODUCING QUALITY MILK

Objectives to be obtained:
The student will be able to:

1. Identify five of the most common off flavors of milk by taste test.
2. List two possible causes for each of the off flavors identified.
3. Identify ten probable causes of off flavor milk on a given dairy farm.
4. List ten important farm requirements of the local milk inspection agency, which relate to quality milk production.
5. Correctly interpret bacteria, sediment, modified whiteside reaction, and antibiotic test results from given samples.
6. Explain the milk secretion and milk ejection process. Correctly list the anatomy and function of each part of the udder and mammary system.
7. Define oxytocin, the milk secreting hormone and its influence on milk letdown.
8. Prepare a cow for milking and successfully milk the cow following recommended procedures.
9. Prepare a planned program for producing quality milk on a given farm which meets the instructor's approval.
# AGRICULTURAL

## Title - PRODUCING QUALITY MILK

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 1 - Factors Affecting Milk Quality.**  
Objective 1  
Identify the five most common off flavors of milk by taste test. | **A.** Milk flavors and causes listed in:  
- Milk Flavor Handbook - Tri-State Milk Flavor Program (New Jersey, New York, Pennsylvania)  
- Producers Milk Flavors Chart - available from extension service  
- Milk Flavor Defects - Their Causes and Prevention - Extension Service, University of Vermont |
| Objective 2  
List two possible causes for each of the off flavors identified. | A. Causes of off flavors as in materials listed for Objective 1.  
- Feed, barny or cowy, salty, rancid  
- Malty, high acid, oxidized, unnatural |
| Objective 3 - Identify ten probable causes of off flavor milk on a given dairy farm. | A. Causes of off flavor as in materials listed for Objective 1.  
- Cleaning and sanitizing utensils  
  - Managed Milking - Bulletin 1193, pp. 10-12  
  - The Sanitary Care of Milking Equipment on the Farm - Bulletin 941  
- Feeding  
- Poor sanitation  
  - stables  
  - cows  
  - milk room  
- Mastitis  
- Poor cooling  
- Medications  
- Ventilation problems  
- Chemical contaminants |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture discussion - define good quality milk. Discuss off flavors and causes.</td>
<td>A. Students will take notes on materials not in student references.</td>
<td>A. Students should correctly identify five common flavors from given samples prepared by the instructor.</td>
</tr>
<tr>
<td>B. Prepare samples for student testing.</td>
<td>B. Study Producing Good Tasting Milk - Bulletin #1171</td>
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<tr>
<td>C. Invite a local milk company fieldman to discuss and show examples of the causes of off flavor milk.</td>
<td>C. Taste-test prepared samples.</td>
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<tr>
<td></td>
<td>D. Students prepare samples under farm conditions for taste testing.</td>
<td></td>
</tr>
<tr>
<td>A. Lecture discussion</td>
<td>A. Study Producing Good Tasting Milk - Bulletin #1171</td>
<td>A. Written test in conjunction with Objective 1. (sample attached)</td>
</tr>
<tr>
<td>B. Lab demonstrations</td>
<td>B. Prepare off flavor samples under farm conditions.</td>
<td>B. Test on unknown samples.</td>
</tr>
<tr>
<td>C. Evaluate samples from home farms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Lecture discussion</td>
<td>A. Study Bulletin #1171</td>
<td>A. Students will find and describe 10 situations on farm that may cause off flavor milk.</td>
</tr>
<tr>
<td>B. Farm visits</td>
<td>B. Study pp. 10-12 of Bulletin #1193</td>
<td>B. Students will score their own farm using a uniform dairy standard inspection report.</td>
</tr>
<tr>
<td>- Observe conditions</td>
<td>C. Locate possible causes of off flavors under farm conditions.</td>
<td></td>
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<tr>
<td>- Utensils</td>
<td>D. Correct situations on a farm that may be leading to off flavors.</td>
<td></td>
</tr>
</tbody>
</table>
## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective 4</th>
<th>List 10 important requirements of the local milk inspection agency which relate to quality milk production.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 5</td>
<td>Correctly interpret bacteria and sediment that results from given samples.</td>
</tr>
<tr>
<td>Unit 2 - Proper Milking Procedure.</td>
<td>Objective 6 - Explain the milk secretion and milk ejection process. List the anatomy and function of each part of the udder.</td>
</tr>
<tr>
<td>Objective 7</td>
<td>Define oxytocin, the milk secreting hormone and its influence on milk letdown.</td>
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</tbody>
</table>

## CONTENT

<table>
<thead>
<tr>
<th>Objective 4</th>
<th>State and local requirements for milk producers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Handbook of Regulatory Rules</td>
</tr>
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<td></td>
<td>Dairy Farm Sanitation Report</td>
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<tr>
<td></td>
<td>New England Uniform Dairy Standard Dairy Farm Inspection Report - H.P. Hood &amp; Sons, Boston, Massachusetts</td>
</tr>
<tr>
<td>Objective 5</td>
<td>Standard plate count (bacteria)</td>
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<td></td>
<td>Modified whiteside reaction (abnormal milk)</td>
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<td></td>
<td>Antibiotic test</td>
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<td></td>
<td>Sediment test</td>
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<tr>
<td>Unit 2 - Proper Milking Procedure.</td>
<td>Parts of mammary system</td>
</tr>
<tr>
<td></td>
<td>Milk secretion process</td>
</tr>
<tr>
<td></td>
<td>Milk ejection process</td>
</tr>
<tr>
<td>Objective 7</td>
<td>The role of oxytocin and milk secretion-ejection.</td>
</tr>
<tr>
<td></td>
<td>Causes of poor milk letdown.</td>
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</tbody>
</table>
### TEACHING METHODS

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<table>
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<tr>
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<tbody>
<tr>
<td>A.</td>
<td>Resource personnel field man or other qualified people review a field inspection report.</td>
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<tr>
<td>B.</td>
<td>Field trip - observe an inspection on a farm.</td>
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### STUDENT APPLICATION ACTIVITIES

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<thead>
<tr>
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<tbody>
<tr>
<td>A.</td>
<td>Take notes from guest speaker.</td>
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<tr>
<td>B.</td>
<td>Observe farm inspection.</td>
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<tr>
<td>C.</td>
<td>Discussion and individual study of regulatory rules</td>
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</tbody>
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### EVALUATION PROCEDURES

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<tbody>
<tr>
<td>A.</td>
<td>Written test (sample attached)</td>
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### TEACHING METHODS

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<thead>
<tr>
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<tbody>
<tr>
<td>A.</td>
<td>Resource personnel - field man and technicians to demonstrate tests.</td>
<td></td>
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<tr>
<td>B.</td>
<td>Lecture discussions.</td>
<td></td>
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<tr>
<td>C.</td>
<td>Use of forms for reporting tests.</td>
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</tbody>
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### STUDENT APPLICATION ACTIVITIES

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<thead>
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<tbody>
<tr>
<td>A.</td>
<td>Students will take notes on how tests are run, what they measure and how to interpret them.</td>
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<tr>
<td>B.</td>
<td>Students will observe testing of samples.</td>
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<tr>
<td>C.</td>
<td>Students will practice interpreting test results laboratory exercise.</td>
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### EVALUATION PROCEDURES

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<tbody>
<tr>
<td>A.</td>
<td>Written test (sample attached)</td>
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### TEACHING METHODS

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<tr>
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<tbody>
<tr>
<td>A.</td>
<td>Movie - Miracle of Milk or Science of Milk Production.</td>
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<tr>
<td>B.</td>
<td>Lecture discussion. Laboratory using cow's udder from a slaughter house.</td>
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<tr>
<td>C.</td>
<td>Field trip to observe a herd being milked</td>
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<td></td>
<td>Cow preparation</td>
<td></td>
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<td></td>
<td>Complete milking</td>
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<td></td>
<td>Sanitation practices used on the farm</td>
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<td></td>
<td>Medication for infected quarters</td>
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### STUDENT APPLICATION ACTIVITIES

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<tbody>
<tr>
<td>A.</td>
<td>Study Bulletins 1193 and 955, and the importance of proper preparation for better milking.</td>
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<tr>
<td>B.</td>
<td>Observe dissection of cow's udder.</td>
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<tr>
<td>C.</td>
<td>Observe effects of different techniques on milk ejection on farm visit.</td>
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### EVALUATION PROCEDURES

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<tbody>
<tr>
<td>A.</td>
<td>Written test matching questions on the anatomy of the udder and mammary system.</td>
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<tr>
<td>B.</td>
<td>Essay question on the secretion of milk.</td>
<td></td>
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<tr>
<td>C.</td>
<td>Performance grade observing students milking - work experience program extra credit.</td>
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</table>

### TEACHING METHODS

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<thead>
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<tbody>
<tr>
<td>A.</td>
<td>Chalk and board session.</td>
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<tr>
<td>B.</td>
<td>Class discussion on milking speeds of dairy animals.</td>
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### STUDENT APPLICATION ACTIVITIES

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<tbody>
<tr>
<td>A.</td>
<td>Students take notes on teacher presentation.</td>
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<tr>
<td>B.</td>
<td>Students describe experience related to their work experience programs.</td>
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### EVALUATION PROCEDURES

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<tbody>
<tr>
<td>A.</td>
<td>Essay question on the milk secreting hormone, oxytocin.</td>
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</table>
### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td><strong>Unit 3 - Planning to Produce Quality Milk.</strong>&lt;br&gt;<strong>Objective 9</strong>&lt;br&gt;Prepare a planned program for producing quality milk on a given farm, which meets the instructor's approval.</td>
<td>A. Plan requirements include:&lt;br&gt;Current farm situation - use results and sanitation reports&lt;br&gt;Possible causes of off flavor&lt;br&gt;Recommendations for correcting the situation</td>
</tr>
<tr>
<td><strong>TEACHING METHODS</strong></td>
<td><strong>STUDENT APPLICATION ACTIVITIES</strong></td>
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</tr>
<tr>
<td>A. Lecture-discussion</td>
<td>A. Study Bulletins #1193, #996</td>
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<tr>
<td>B. Demonstration</td>
<td>B. Observe demonstrations and</td>
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<tr>
<td>C. Slides - The Cow's</td>
<td>practice milking procedure</td>
</tr>
<tr>
<td>Udder and How It</td>
<td>C. Students prepare and</td>
</tr>
<tr>
<td>Functions - Cornell</td>
<td>correctly milk cows on the</td>
</tr>
<tr>
<td>IMS</td>
<td>home farm or cooperative</td>
</tr>
<tr>
<td>D. Film - &quot;The</td>
<td>farm.</td>
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<tr>
<td>Science of Milk</td>
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<tr>
<td>Production&quot; -</td>
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<tr>
<td>Rallston-Purina</td>
<td></td>
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<tr>
<td>Company</td>
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<tr>
<td>A. Lecture-discussion</td>
<td>A. Prepare farm plan for</td>
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<tr>
<td>B. Individual</td>
<td>producing high quality milk.</td>
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<tr>
<td>instruction</td>
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<td>Classroom</td>
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<td>Supervised farm</td>
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<td>instruction</td>
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<td>C. Veterinarian as</td>
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<td>a resource</td>
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<td>person to describe</td>
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<td>class an approved</td>
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<td>program for</td>
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<td>milk.</td>
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</table>
MODULE OF INSTRUCTION

Title - PRODUCING QUALITY MILK
Code - 01.01010101-01

RESOURCE MATERIALS

BOOKS
Teacher
Englewood Cliff, New Jersey
Milk Flavor Handbook - Tri-State Milk Flavor Program (New Jersey, New York, Pennsylvania)

BULLETINS
Teacher
1. The Sanitary Care of Milking Equipment on the Farm, Cornell Extension Bulletin 941.
2. Recommended Milking Practices, Cornell Extension Bulletin 996
3. Managed Milking, Cornell Extension Bulletin 1193
4. Producing Good Tasting Milk, Cornell Extension Bulletin 1171
5. The Importance of Proper Preparation for Better Milking, Dairy Equipment Company (IMS was source).
7. The Cow's Udder and How It Functions, University of Illinois Vocational Agriculture Service, Urbana, Illinois.
8. Good Tasting Milk, Vermont Agriculture Extension Service Brieflet 9, 56.
9. The Story of Milk, IMS.

Student
Bulletins from teacher reference list #1, 2, 3, 4, 5 and 6. If available, 7 and 8.

BRIEFLETS
1. Milk Under the Microscope, Vermont Extension Service, University of Vermont, Brieflet 1060.
2. Milk Flavor Defects - Their Causes and Prevention, University of Vermont Agricultural Extension Service.

CIRCULARS
RESOURCE MATERIALS (continued)

PERIODICALS
1. Dairyman's League News
2. A.D.A. and D C Reporter
3. Eastern Milk Producers Cooperative
4. Milk Marketing Releases
5. Hoards Dairyman

AUDIOVISUALS
1. Miracle of Milk - American Dairy Association - local office or Chicago, Illinois.
2. Science of Milk Production, Ralston Purina Company, Checkerboard Square, St. Louis, Missouri.
4. The Cow's Udder and How It Functions (filmstrip, 43 frames), IMS.
# NEW ENGLAND UNIFORM DAIRY STANDARD

## Dairy Farm Inspection Report

**Inspected For Sale In:**
- **Maine**
- **New Hampshire**
- **Rhode Island**
- **Massachusetts**
- **Connecticut**
- **Vermont**

### Name:

#### Signature of Producer:

**SIR:** An inspection of your dairy has been made, and you are hereby notified that...

#### Post in Milkroom

**Location:**

**Date:**

**Field Servicemen:**

**Remarks:**

**Permit No.:**

**Expiration Date:**

**Pounds Sold Daily:**

**Plant:**

<table>
<thead>
<tr>
<th>Cows</th>
<th>Cleaning Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Abnormal Milk: (15)</td>
<td>Two-compartment wash and rinse station (a)</td>
</tr>
<tr>
<td>(2)</td>
<td>Suitable water heating facilities (b)</td>
</tr>
<tr>
<td>(3)</td>
<td>Water under pressure piped to milkhouse (c)</td>
</tr>
<tr>
<td>(4)</td>
<td>Floors, walls, windows, tables and similar non-product contact surfaces clean (d)</td>
</tr>
<tr>
<td>(5)</td>
<td>No trash, unnecessary articles, animals or fowl permitted (e)</td>
</tr>
<tr>
<td>(6)</td>
<td>Pesticides and medicinals not stored in milkhouse (f)</td>
</tr>
</tbody>
</table>

### MILKING BARN, STABLE, OR PARLOR

1. **Construction:**
   - Floors, gutters, and feed troughs of concrete or equally impervious materials; in good repair (1) (a)
   - Walls and ceilings smooth, painted or finished (b) (a)
   - Separate stalls or pens for horses, calves, and bulls (c) (a)
   - Manure stored inaccessible to cows (d) (a)

### MILKHOUSE OR ROOM

5. **Construction and Facilities:**
   - Floors (1) (a)
   - Smooth; concrete or other impervious material, in good repair (b) (a)
   - Graded to drain (c) (a)
   - Drains trapped in concrete, as a seal (d) (a)
   - Walls and ceilings (1) (a)

### MILKING CONTINUED

**Cows:**

- A5:... Parat... equipment

**Remarks:**

**Date:**

**Not Approved:**

**Reinspect:**

**Exclude:**

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**MILKING—Continued**

**PERSONNEL**

12. **Hand-Washing Facilities:**
   - Soap, running water, and individual sanitary toweils in milkroom and convenient to milking operations (a) (a)
   - Wash and rinse not used as hand-washing facilities (b) (a)

### UTENSILS AND EQUIPMENT

9. **Construction:**
   - Smooth, nonabsorbent, corrosion-resistant, non-toxic materials; easily cleanable; means free of contamination (a) (a)
   - No improper submerged inlets (b) (a)
   - All multi-use containers and equipment subject to approved sanitization process (c) (a)
   - Single-service articles properly stored (d) (a)
   - Sanitized milk contact surfaces not exposed to contamination (e) (a)

### VEHICLES

20. **Vehicles:**
   - Vehicles clean (a) (a)
   - Constructed so as to protect milk (b) (a)
   - No contaminating substances transported (c) (a)

### INSECTS AND RODENTS

21. **Insect and Rodent Control:**
   - Flies breeding minimized by approved means (a) (a)
   - Milking barn, stable, or parlor, except as permitted by Regulation (b) (a)
   - Surrounding neat and clean; free of harborage and breeding areas (c) (a)
### Dairy Farm Sanitation Report

#### Cows

1. **Abnormal Milk**
   - a. Apparently healthy, good condition
   - b. Diseased cattle segregated, milked last
   - c. Proper construction, clean handling equipment
   - d. Evidence strip cup or other test used
   - e. Abnormal milk not sold

2. **Construction**
   - a. Floors, gutters, feed troughs, concrete, graded, good repair
   - b. Walls, ceiling smooth, tight, good repair, painted biennially
   - c. Properly ventilated, feed pens, self-closing
   - d. Evidence strip cup or other test used
   - e. Adequate natural and artificial light

3. **Cleanliness**
   - a. No poultry, pigeons, other animals
   - b. Walls, windows, clean
   - c. Adequate natural and artificial light
   - d. Proper disposal of waste
   - e. Welfare on premises

4. **Handling**
   - a. Accurate milking, udders clipped, clean
   - b. Temperature properly maintained until delivered
   - c. Milker parts disassembled, except CIF', stored dry

5. **Construction and Facilities**
   - a. Floors concrete or equally secure, good repair, smooth
   - b. Milker parts disassembled, except CIF', stored dry
   - c. Vacuum system adequate, pulsator properly maintained
   - d. Approved CIP milk pipeline system with vat

6. **Water Supply**
   - a. Adequate water available, double wash vats
   - b. Water piped under pressure
   - c. Clear and drinkable

7. **Toilet and Water Supply**
   - a. Toilets, sinks, faucets, clean
   - b. Water tanks, pipes, clean
   - c. Water supply, clean

### Evaluation Results

#### Notation to Plant

- **YES**
- **NO**

#### Indicating Major Items

- a. Pleasant, odorless, clean
- b. Wind, rain, snow, ice
- c. Free of foreign objects, insects, rodents
- d. No other buildings, fences, gates

#### Table Columns

- **COWS**
- **NO. CATTLE**
- **DATE TO TEST**
- **POST OFFICE ADDRESS**
- **DATE BRUCELLOSIS TEST**
- **COUNTY**
- **STATE**
- **STATUS**
- **BURN OFF TEST RESULTS**
- **BUYER'S ADDRESS**
- **LOCATION**
- **PREVIOUS BUYER**

#### Score Symbols

- \( \square \) Yes
- \( \times \) No
- \( \_ \) Indeterminate

---

**Handwash Facilities**

- a. Convenient, adequate
- b. Personal cleanliness
- c. Sanitary wash facilities

**Personnel**

- a. Stockman, udder cleaner
- b. Milker, stockman, udder cleaner

**Insects and Rodents**

- a. No evidence of external contamination
- b. No evidence of internal contamination

**Vehicles**

- a. Vehicles clean, constructed to protect milk
- b. No contamination surfaces transported
### PATRONS REPORT OF QUALITY ANALYSIS

**PATRON NO.** __________  **SAMPLE DATE** __________

<table>
<thead>
<tr>
<th>STANDARD PLATE COUNT/ML</th>
<th>Maximum Allowable Count 100,000/ml</th>
</tr>
</thead>
</table>

#### SEDIMENT
- **GOOD**
- **FAIR**
- **POOR**

#### ABNORMAL MILK
- **WHITESIDE TEST NEG.**
- **TP 1 PLUS**
- **2 PLUS OR GREATER**
- **SOMATIC CELL COUNT**
- **1,500,000 Maximum Allowable Somatic Cell Count**

#### ANTIBIOTICS
- **NEG.**
- **POS.**

#### FLAVOR SCORE
- **GOOD**
- **FAIR**
- **POOR**
- **OXIDIZED**
- **RANCID**
- **FEED-UNCLEAN**
- **BARNY**
- **OTHER** __________

---

### Sample

**UPSTATE MILK COOPERATIVES, INC.**
1730 DALE ROAD, BUFFALO, N.Y. 14225

---

**0 935**
Producing Quality Milk

Determining off flavors and their causes

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Flavor</th>
<th>Possible Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
<td></td>
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<tr>
<td>2.</td>
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<td>3.</td>
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<tr>
<td>4.</td>
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<tr>
<td>5.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Test for Objective #4 of Quality Milk Production Module

For each of the following major areas of the Dairy Farm Sanitation Report, list three regulations a farmer must comply with.

A. Milking Area
   1. 
   2. 
   3. 

B. Milk House
   1. 
   2. 
   3. 

C. Utensils, Transfer Vessels, Liners and Bulk Tanks
   1. 
   2. 
   3.
Test for Objective #5 of Quality Milk Production Module

Correctly interpret the following milk quality test course by explaining what they represent and whether the score is good, fair or poor.

1. SEDIMENT TEST OF

2. STANDARD PLATE COUNT OF

3. MODIFIED WHITESIDE REACTION OF

4. ANTIBIOTIC TEST
Notes from presentation from Mrs. Hines Laboratory Technician, Upstate Milk Cooperative, 1730 Dale Road, Buffalo, New York 14225.

1. Standard Plate Count

   Measures growth of bacteria in milk. The maximum allowed is 100,000 colonies per ml. Most farmers are under 30,000.

   The sample is diluted 1 ml. milk and 99 ml. sterile water then put on agar plate at 98 degrees for 48 hours. Then the colonies of bacteria are counted.

   1. Streptococci - poor cooling
   2. Staphylococci - contaminated utensils
   3. Streptococcus agalactiae - mastitis

2. Abnormal Milk (Modified Whiteside Reaction)

   A count of white blood cells indicating cow's health or mastitis. Milk is mixed with NaOH and stirred then compared to photo available from G. Hadley Smith, Carey Building, Ithaca. It is scored as negative, trace, 1+, 2+, 3+. One plus is the cutoff.

3. Antibiotic Test

   A sterile disc is dipped in milk and put on a bacteria plate. If antibiotic is present, a ring appears due to death of bacteria culture. Test is positive or negative. If positive, milk is withheld for four milkings as penalty.

4. Sediment Test

   Measures sediment as mg. per pint. One pint of milk is forced through a .4" disc. Rejection point is 1.5 mg. per pint. Scores are 0, 1, 2, 3, 4, 5.

Recorded by

Gary Barton
Spring 1971
# MILK FLAVOR DEFECTS
## THEIR CAUSES AND PREVENTION

<table>
<thead>
<tr>
<th>Flavor Defects</th>
<th>Causes</th>
<th>Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed</td>
<td>Pasture Silage Thawing or storing silage in stable</td>
<td>Remove from pasture 4 hours before milking. Keep cows away from silage for 4 hours before milking. Avoid this practice. Ventilate.</td>
</tr>
<tr>
<td></td>
<td>Dirty stables Dirty cows Damp stables Poor ventilation</td>
<td>Clean stables. Clean cows. Proper ventilation.</td>
</tr>
<tr>
<td>Dirty stables</td>
<td>Dirty cows Damp stables Poor ventilation</td>
<td>Healthy cows properly milked. Discard milk from cows being dried off.</td>
</tr>
<tr>
<td>Dirty cows</td>
<td></td>
<td>Discard milk from cows being dried off. Cool quickly and keep cold. Reduce foaming. Agitate as little as possible.</td>
</tr>
<tr>
<td>Damp stables</td>
<td>Poor ventilation</td>
<td>Healthy cows properly milked. Clean, sanitized utensils and stanchion hoses. Cool quickly and keep cold. Eliminate milkstone.</td>
</tr>
<tr>
<td>Poor ventilation</td>
<td></td>
<td>Eliminate milkstone. Clean and sanitize. Cool quickly and keep cold.</td>
</tr>
<tr>
<td>Stripper cows</td>
<td></td>
<td>Clean, sanitized utensils and stanchion hoses. Cool quickly and keep cold. Eliminate milkstone.</td>
</tr>
<tr>
<td>Rancid</td>
<td>Stripper cows Poor cooling Foaming Agitation</td>
<td>Replace with stainless steel.</td>
</tr>
<tr>
<td>Malty</td>
<td>Mastitis Dirty utensils, including stanchion hoses Poor cooling High bacteria</td>
<td>Use colorless petroleum jelly. Use odorless disinfectants. Use sprays with little or no odor. Sweep twice daily. Prevent water bowl leakage. Feed after milking. Discard milk.</td>
</tr>
<tr>
<td>High acid</td>
<td>High bacteria Dirty utensils Poor cooling</td>
<td>Use colorless petroleum jelly. Use odorless disinfectants. Use sprays with little or no odor. Sweep twice daily. Prevent water bowl leakage. Feed after milking. Discard milk.</td>
</tr>
<tr>
<td>Oxidized</td>
<td>Exposed copper, bronze, or brass in milker parts Exposed iron or rust in pails, cans, strainers Daylight</td>
<td>Replace with stainless steel.</td>
</tr>
</tbody>
</table>
Title - DAIRY CATTLE BREEDING

Description:

Developing a dairy herd breeding program - The student will acquire knowledge of inheritance, reproduction and study the available methods of breeding dairy cattle in his or her community. The student will plan and develop an efficient breeding program for a dairy herd including determining the breeding time, animal identification, breeding difficulties and record keeping.

The student will visit local farms and the headquarters of an artificial insemination unit.

Major Divisions or Units of Content

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fundamentals of Genetics</td>
<td>4</td>
</tr>
<tr>
<td>2. Physiology of Reproduction</td>
<td>4</td>
</tr>
<tr>
<td>3. Establishing Proper Time of Breeding</td>
<td>3</td>
</tr>
<tr>
<td>4. Methods of Breeding</td>
<td>1</td>
</tr>
<tr>
<td>5. Breeding Difficulties</td>
<td>2</td>
</tr>
<tr>
<td>6. Establishing Working Relationships with Veterinarians &amp; Inseminators</td>
<td>1</td>
</tr>
<tr>
<td>7. Keeping Individual Cow Records</td>
<td>2</td>
</tr>
<tr>
<td>8. Interpreting A.I. Sire Reports</td>
<td>3</td>
</tr>
<tr>
<td>9. Determining A Breeding Program</td>
<td>0</td>
</tr>
</tbody>
</table>

Revised June, 1974
OBJECTIVES to be obtained

The student will be able to:

1. Demonstrate knowledge of basic genetics by describing the inheritance of production and other inherited characteristics.

2. Describe and give examples of the four systems of breeding cattle.

3. Identify and explain the functions of the reproductive parts of the male and female dairy animal.

4. Demonstrate the ability to detect heat periods in dairy cows and establish the optimum time for breeding by describing the signs of heat.

5. Describe the merits of natural service and A.I. service. Students will become familiar with A.I. techniques involved in breeding dairy animals.

6. Identify irregularities causing breeding difficulties.

7. Become familiar with services of the veterinarian and inseminator.

8. Demonstrate the ability to keep individual cow breeding records, record and analyze the information.

9. Interpret the reports and ratings of the A.I. and breed association sire evaluation programs.

10. From the information received in this module develop a breeding program that will improve a herd's production and longevity.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Fundamentals of Genetics</strong>&lt;br&gt;Objective #1&lt;br&gt;Demonstrate knowledge of basic genetics by describing the inheritance of production and other inherited characteristics.</td>
<td>A. Basic Genetics&lt;br&gt;B. Laws of inheritance&lt;br&gt;   - Sex determination&lt;br&gt;   - Sex-link characters&lt;br&gt;     - Dominant &amp; recessive characteristics&lt;br&gt;     - Undesirable recessives&lt;br&gt;     - Lethal genes&lt;br&gt;     - Mutations&lt;br&gt;C. Inheritance of Production&lt;br&gt;D. Inheritance factors that influence type</td>
</tr>
<tr>
<td><strong>Objective #2</strong>&lt;br&gt;Describe and give examples of the four systems of breeding cattle.</td>
<td>A. Systems of breeding cattle&lt;br&gt;   - Line breeding&lt;br&gt;   - In breeding&lt;br&gt;   - Out crossing&lt;br&gt;   - Cross breeding</td>
</tr>
<tr>
<td><strong>Unit 2 - Physiology of Reproduction</strong>&lt;br&gt;Objective #3&lt;br&gt;Identify and explain the functions of the reproductive parts of the male and female dairy animal.</td>
<td>A. Physiology&lt;br&gt;   - Male organs&lt;br&gt;   - Female organs&lt;br&gt;   - Conception&lt;br&gt;   - Twinning&lt;br&gt;   - Process of birth&lt;br&gt;   - Hormone action as related to the reproduction tract</td>
</tr>
<tr>
<td><strong>Unit 3 - Establishing Proper Time of Breeding</strong>&lt;br&gt;Objective #4&lt;br&gt;Demonstrate the ability to detect heat periods in dairy cows and establish the optimum time for breeding by describing the signs of heat.</td>
<td>A. Establishing Breeding Time&lt;br&gt;   - Length of time after parturition&lt;br&gt;   - Estimated conception pattern&lt;br&gt;   - Length of time required for reproductive organs to return to normal&lt;br&gt;   - Estimated optimum calving interval&lt;br&gt;   - Heat detection program&lt;br&gt;     - signs of heat&lt;br&gt;     - observation of cows&lt;br&gt;     - daily exercise schedule&lt;br&gt;   - Proper time during heat period to breed&lt;br&gt;   - Length of heat period</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Field trip to area farms to observe method of breeding cattle. B. Lecture - discuss C. Assign questions from textbooks on breeding systems.</td>
<td>A. Students describe method of breeding cattle used on cows in his supervised experience program.</td>
</tr>
<tr>
<td>A. Diagrams &amp; Functions - Transparencies-Cornell IMS Sterility in dairy cattle-Hoards B. Veterinarian-demonstration of parts &amp; functions of an actual male &amp; female reproductive tract obtained from local butcher. C. Film-Reproduction of Farm Animals - Cornell Film Library Colored Slides - &quot;The Developing Fetus&quot; Cornell IMS</td>
<td>A. Label diagram &amp; list functions of male and female reproductive tracts from references. B. Observe carefully the veterinarian as he dissects and explains functions of reproductive tracts.</td>
</tr>
<tr>
<td>A. Lecture - Discussion Eastern A. I. Charts B. Colored Slides -&quot;Signs of Heat in the Dairy Cows&quot; Cornell IMS C. Slides - &quot;The Recovery of the Uterus after Calving&quot;-Cornell IMS</td>
<td>A. Note taking - draw a time interval chart for breeding dairy cows. B. Students may work with the home farm or cooperative farm herd in determining the proper time for breeding cows. A record could be maintained by the student indicating his observations and recommendations. The teacher can check these records during a supervised work experience visit.</td>
</tr>
<tr>
<td>D. Use Hoards Dairy Sterility Unit &amp; film strips on sterility &amp; reproduction - American Breeder filmstrips-Dairy Production</td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Unit 4 - Methods of Breeding</strong></td>
<td>A. Methods</td>
</tr>
<tr>
<td>Objective #5</td>
<td>B. Natural Service -</td>
</tr>
<tr>
<td>Describe the merits of natural service and A. I. service.</td>
<td>. Natural breeding facilities</td>
</tr>
<tr>
<td>Students will become familiar with A. I. techniques involved in breeding dairy</td>
<td>. Handling of animals</td>
</tr>
<tr>
<td>animals.</td>
<td>. Proving a herd sire</td>
</tr>
<tr>
<td></td>
<td>. Production</td>
</tr>
<tr>
<td></td>
<td>. Type</td>
</tr>
<tr>
<td></td>
<td>. Sales Appeal</td>
</tr>
<tr>
<td></td>
<td>C. Artificial Insemination</td>
</tr>
<tr>
<td></td>
<td>. Techniques of breeding A. I.</td>
</tr>
<tr>
<td></td>
<td>. Freezing of semen</td>
</tr>
<tr>
<td></td>
<td>. Storage facilities</td>
</tr>
<tr>
<td></td>
<td>. A. I. Services</td>
</tr>
<tr>
<td><strong>Unit 5 - Breeding Difficulties</strong></td>
<td>A. Breeding irregularities</td>
</tr>
<tr>
<td>Objective #6</td>
<td>. Abnormal heat cycles and periods</td>
</tr>
<tr>
<td>Identify irregularities causing breeding difficulties.</td>
<td>. Cystic ovaries</td>
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<td></td>
<td>. Abnormal discharges</td>
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<td></td>
<td>. Genital disease</td>
</tr>
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<td></td>
<td>. Hormonal disturbances</td>
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<td></td>
<td>. Nutritional deficiencies</td>
</tr>
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<td></td>
<td>. Anatomical defects</td>
</tr>
<tr>
<td><strong>Unit 6 - Establishing Working Relationships with Veterinarians &amp; Inseminators</strong></td>
<td>A. Working Relations</td>
</tr>
<tr>
<td>Objective #7</td>
<td>. What the dairyman should expect from the technician</td>
</tr>
<tr>
<td>Become familiar with services of the veterinarian and inseminator.</td>
<td>. What the technician should expect from the dairyman</td>
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<tr>
<td></td>
<td>. Pregnancy examinations by veterinarian</td>
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<td>. Treating abnormalities by the veterinarian</td>
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<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
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</tr>
</tbody>
</table>
| A. Field trip to breeder who has successfully merchandized a herd sire. Observe facilities.  
B. Field trip to an A. I. stud. Observe handling of sires. Drawing of sire list. Freezing & storage labs.  
D. Speaker-local district A.I. personnel. | A. Note taking on field trips.  
B. Travel with local inseminator.  
C. Panel discussion: Use of a herd sire vs A.I. for my herd. | A. Orally describe the techniques of A. I. and the merits of A. I. Breeding and the use of natural service.  
B. Written-examination on unit 4 factual information. |
| A. Lecture - Discussion  
B. Speaker - Veterinarian or tape recording of veterinarian.  
C. Field trip - local farm to study breeding history of the herd.  
D. Supervised study  
E. Sterility in Dairy Cattle - Hoard's | A. Obtain breeding records and conception % of own herd, employer's herd, or neighbor's herd. Study records and evaluate results.  
B. Travel with a veterinarian to a problem herd. Observe how the veterinarian handles specific problems. | A. Written exam on breeding irregularities.  
B. Student report on field trip with a veterinarian. |
| A. Tape recording of local A. I. technician and veterinarian on working relationships with the farmer.  
B. Invite resource people to class for a discussion on veterinarian and A. I. inseminator services. | A. Working relations can be discussed as you travel with the veterinarian or local A.I. technician. | A. Teacher recognition of student travel with veterinarian and/or inseminator.  
B. Oral reports by students regarding the information given by resource people. |

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<table>
<thead>
<tr>
<th>Unit 7 - Keeping Individual Cow Records</th>
<th>Objective #8</th>
<th>Demonstrate the ability to keep individual cow breeding records, record and analyze the information.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONTENT</strong></td>
<td>A. Breeding Records</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Identification</td>
<td></td>
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<td>C. Reproduction -</td>
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<tr>
<td></td>
<td>- Calving date</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Sires used</td>
<td></td>
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<td></td>
<td>- Sex</td>
<td></td>
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<td></td>
<td>- Disposition of calves</td>
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<td>- Earliest breeding date</td>
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<td></td>
<td>- Heat periods</td>
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<td></td>
<td>- Breeding dates</td>
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<td></td>
<td>- Service information</td>
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<td>- Pregnancy examination</td>
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<td>- Veterinary treatment</td>
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<td>- Due to calve date</td>
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<td></td>
<td>- Drying out date</td>
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<tr>
<td></td>
<td>D. Plot cow families</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Write pedigrees</td>
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</table>

<table>
<thead>
<tr>
<th>Unit 8 - Interpreting A. I. Sire Reports</th>
<th>Objective #9</th>
<th>Interpret the reports and ratings of the A. I. and breed association sire evaluation programs.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONTENT</strong></td>
<td>A. A. I. Sire Summaries</td>
<td></td>
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<tr>
<td></td>
<td>- Production level</td>
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</tr>
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<td>- Type evaluation</td>
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<tr>
<td></td>
<td>- Method of determination</td>
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<td></td>
<td>B. Breed Association Sire Performance Summaries</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Production</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Type</td>
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<td></td>
<td>- Repeatability</td>
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</tr>
<tr>
<td></td>
<td>- Mature equivalent</td>
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<table>
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<tr>
<th>Unit 9 - Determining a Breeding Program</th>
<th>Objective #10</th>
<th>From the information received in this module develop a breeding program that will improve a herd's production and longevity.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CONTENT</strong></td>
<td>A. Breeding Program Considerations</td>
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</tr>
<tr>
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<td>B. Laws of inheritance</td>
<td></td>
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<td></td>
<td>C. Factors to consider in mating</td>
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<td></td>
<td>- Increasing production</td>
<td></td>
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<td></td>
<td>- Correcting type weaknesses</td>
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<td>- Size</td>
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<td>- Color</td>
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<td></td>
<td>- Cost</td>
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</tr>
</tbody>
</table>

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### Teaching Methods
- Display actual breeding records for observation - different charts.
- Interpretation of DHIC informational sheets on breeding data.
- Note taking on breeding records to keep.
- Display pedigree forms.
- Display cow family charts.
- Supply students with sample copies of completed pedigree forms.

### Student Application Activities
- Students select a breeding chart and actually keep breeding records on cows in their supervised experience program.
- Students write up pedigrees and plot cow families of cows in his supervised experience program.
- Student discussion of sample pedigrees and cow family charts.

### Evaluation Procedures
- Teacher evaluation of breeding charts kept by students.
- Teacher evaluation of pedigrees and cow family charts.
- Rate a group of sires based on information from sire summary reports.
- Participate in a herd classification activity observing an official breed classifier.
- Attend a breeders institute meeting in your area. Nationally known speakers.
- Determine a breeding program to fit your needs listing specific matings and justify each mating.

### Notes
- Supervised interpretation of sire summaries of individual sires.
- Extension Service A.I. Sire Summary listings.
- Work sheets on mature equivalent. Sire selection committee.
- Resource people representing the major breeds in the area.
- Supervised study of considerations in a breeding program.
- Review notes.
- Speaker - successful breeder of dairy cattle in the community.
- Field trip to a farm that has done a fine job in improving his herd's production and type by selective breeding.

<table>
<thead>
<tr>
<th>28</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
</tr>
</tbody>
</table>
RESOURCE MATERIALS

Books:
- Anatomy & Physiology of Farm Animals - Frandson - Lea & Febiger
- Reproduction in Farm Animals - Hafez - Lea & Febiger
- Principles of Genetics - Gardner - Wiley
- Cattle Fertility & Sterility - Asdell - Little & Brown
- Breeding & Improvement of Farm Animals, 6th ed, Rice - McGraw-Hill
- Artificial Insemination of Farm Animals, Perry - Rutgers
- Sterility in Dairy Cattle-Hoard's Dairyman.

Bulletins:
- Artificial Insemination of Livestock - Illinois, available IMS
- Sterility & Delayed Breeding of Dairy Cattle - Cornell E737
- Selection & Evaluation of Dairy Sires, E1118
- Estimating Transmitting Ability of Sires, Cornell 1217
- Reproduction of Farm Animals - Cornell (out of print)

Periodicals:
- Artificial Insemination (monthly) - Nat. Assn. of Animal Breeders
- Eastern A. I. Cooperator - Eastern A. I. Coop.
- All Breed Assn. Magazines
- Hoard's Dairyman

Audiovisuals:
- Dairy Visuals, 16 masters, available from IMS
- Dairy Cattle Sterility (45 slides) Cornell IMS
- Recovery of the Uterus After Calving - IMS
- Signs of Heat in Dairy Cattle - Slides - IMS
- The Developing Fetus - Slides - IMS
DESCRIPTION:

The conversion of feeds into milk at the lowest cost possible is a basic challenge to dairymen. Proper selection of high quality economical feeds is essential for profitable milk production. The farmer is continually feeding animals that do not yet produce to their inherited genetic base during their production years. The farmer must select feeds and plan his feeding program to produce milk at the most economical cost possible in this area.

Students involved with this module will develop the skills required in selecting feeds to meet the nutritional needs of calves, dry cows, and cattle in production. Emphasis will be placed on a good feeding program for calves, nutritional values of feeds, and the requirements for growth, production, reproduction and maintenance of the herd.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Digestive tract and the digestive process</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2. Feeds available</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>3. Nutritional needs of springing heifers and dry cows</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>4. Nutritional needs of the milking herd</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5. Feeding practices</td>
<td>$\frac{2}{5}$</td>
<td>$\frac{28}{25}$</td>
</tr>
</tbody>
</table>

Revised June, 1974
OBJECTIVES to be fulfilled:

The student will be able to:

1. List the parts of the digestive tract and the functions of each part in the digestive process.

2. List the forage crops which are the most economical to grow in the area and note their nutritional values and production costs.

3. List the crops to which concentrates which are the most economical to grow in the area and list their nutritional values.

4. List the By-Product Feeds available in the area. Know from what process they are produced. Their identification, nutritive value and cost.

5. List the feeds that are available in your area (both forage, and supplements) discuss their nutritional values.

6. Calculate the nutritional needs for springing dairy heifers and dry cows (allowing for pregnancy).

7. Calculate the nutritional needs for -- given examples of -- milking cows in the three different categories of production listed: (1) production maintenance and growth, (2) production, maintenance and pregnancy, (3) production and maintenance only.

8. List five ways for providing mineral supplements for dairy cattle.

9. Balance, to the instructor's satisfaction, a ration for a given situation concerning dry cow, three years old.

10. Balance, to the instructor's satisfaction, a ration for a given situation concerning a milking cow carrying a calf for five months.

11. List the advantages of complete feeds in feeding dairy cattle.
## OBJECTIVES BY UNIT

**Unit 1 - Digestive tract and the digestive process**

**Objective #1**
The student will be able to list the parts of the digestive tract and the functions of each part in the digestive process.

<table>
<thead>
<tr>
<th>A. The Digestive Tract</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mouth</td>
<td>Rumen</td>
</tr>
<tr>
<td>Esophagus</td>
<td>Small Intestine</td>
</tr>
<tr>
<td>Reticulum</td>
<td>Large Intestine</td>
</tr>
<tr>
<td>Rumen</td>
<td></td>
</tr>
</tbody>
</table>

**B. Functions**
- Mastication
- Regurgitation
- Rumenation
- Digestion

**Unit 2 - Feeds available for dairy cattle**

**Objective #2**
List the forage crops which are the most economical to grow in the area and note their nutritional values and production costs.

**Objective #3**
List the crops classified as concentrates which are the most economical to grow in the area and list their nutritional values.

<table>
<thead>
<tr>
<th>A. Forages</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay</td>
<td>Medium red clover</td>
</tr>
<tr>
<td>Alfalfa</td>
<td>Timothy</td>
</tr>
<tr>
<td>Birdsfoot trefoil</td>
<td>Sudungrass, Millet</td>
</tr>
<tr>
<td></td>
<td>Others and mixtures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Silage</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haylage</td>
<td></td>
</tr>
<tr>
<td>Corn Silage</td>
<td></td>
</tr>
<tr>
<td>Sorghum</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Grains</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn</td>
<td>High moisture corn</td>
</tr>
<tr>
<td>Oats</td>
<td>Rye</td>
</tr>
<tr>
<td>Wheat</td>
<td>Barley</td>
</tr>
</tbody>
</table>
### Teaching Methods

<table>
<thead>
<tr>
<th>A. Supervised study from references:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Labeling the parts of the digestive tract</td>
</tr>
<tr>
<td>2. Feeds and Feeding Company Booklets</td>
</tr>
<tr>
<td>B. List the functions of each part</td>
</tr>
<tr>
<td>C. Film - &quot;The Rumen Story&quot;</td>
</tr>
</tbody>
</table>

**Reference:** Ralston-Purina Co., Cornell Film Library

### Student Application Activities

| A. From a mimeo of the digestive tract students will label the parts and list the functions of each part in the spaces provided. |

### Evaluation Procedures

| A. Instructor's evaluation of the list and charted values. |

---

### Teaching Methods

<table>
<thead>
<tr>
<th>A. Supervised study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ref. Feeds and Feeding</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Discussion (class)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Field trips to local feed mills and feed dealers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Compile a list of forages raised in the area.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Chart the values of each forage for D.P., T.D.N., and net energy, and cost. Relate date of harvest to feeding value.</td>
</tr>
<tr>
<td>C. Discuss each crop in class noting reasons for using it or not using it.</td>
</tr>
</tbody>
</table>

### Student Application Activities

<table>
<thead>
<tr>
<th>A. Compile a list of grains raised in the area.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Chart the values of each grain for D.P., T.D.N., and cost.</td>
</tr>
<tr>
<td>C. Figure costs on 100 lbs TDN Bases.</td>
</tr>
<tr>
<td>D. Identify plates of cereal grains.</td>
</tr>
<tr>
<td>E. Panel discussion of value of raising corn and oats. One group supports the crop, while the other resists it.</td>
</tr>
<tr>
<td>F. Have students visit feed companies to collect ingredient samples and feed tags.</td>
</tr>
</tbody>
</table>

### Evaluation Procedures

<table>
<thead>
<tr>
<th>A. Instructor's evaluation of list and charted values.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Quiz on identification of feeds and grains.</td>
</tr>
<tr>
<td>C. Instructor make up a quiz using ingredient and concentrates used in formulating feeds.</td>
</tr>
<tr>
<td>D. Test to determine if students could identify ingredients and concentrates.</td>
</tr>
</tbody>
</table>
### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective #4</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| List the By-Product Feeds available in the area. Know from what process they are produced, their identification, and describe nutritive values and cost of these by-products. | A. By-Product Grains:  
- Brewers Grain  
- Distillers Grain  
- Dried skim milk  
- Meat and bone meal  
- Soybean oil meal  
- Linseed oil meal  

- Cottonseed oil meal  
- Beet pulp  
- Citrus pulp |

<table>
<thead>
<tr>
<th>Objective #5</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| List the feeds that are available in your area (both forage and supplements); discuss their nutritional values and costs. | A. Roughages  
- Hay  
- Corn silage  
- Haylage  

- B. Supplements  
- Corn  
- Oats  
- Wheat  
- By-Products Concentrates  

- C. Factors to consider  
- Quality  
- Cost  
- Availability |

<table>
<thead>
<tr>
<th>Unit 3 - Nutritional needs of springing heifers and dry cows</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective #6 | Calculate the nutritional needs for springing heifers and dry cows (allowing for pregnancy). | A. Feeding the dairy heifer  
- Estimating the weights of dairy heifers  
- Feeding schedule for dairy heifer  

- B. Winter feeding hay, silage, and concentrates  
- C. Feeding heifers on pasture  

- D. Water and minerals  
- E. Preparation for freshening factors -  
  - Body (maintenance)  
  - Pregnancy  
  - Growth |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
</table>
| A. Supervised study  
Ref: Feeds and Feeding  
Feed Co. Publications  
B. Obtain by-products and concentrates from local feed outlet for identification. | A. Chart the values of each by-product for D.P., T.D.N., Net Energy and cost.  
B. Figure the cost of each on 100 lbs and ton bases  
C. Identify samples of by-product concentrates. | Written test:  
A. Match-up questions on by-product grains  
B. Identification of by-product grains  
C. Problem on cost of a concentrate figuring 100 lbs and ton bases. |
| A. Supervised study  
B. Panel Discussion  
C. To buy or not to buy hay and silage  
D. Local feed store manager discuss in class the availability of concentrates and mechanics involved in costs.  
E. Feed Co. Fieldman discuss in class supplement feeds and new materials, such as liquid protein. | A. Compile a list of available feeds  
B. Prepare a discussion (5 people support buying hay and silage and 5 people support raising hay and silage). | A. Written or oral test  
B. List feeds available to be purchased and their costs. |
| A. Lecture  
B. Class Discussion  
C. Supervised study  
- Feeds and Feeding Abridged  
- Raising dairy calves and heifers (Bulletin)  
- Animal Science  
- Magazine articles  
D. Field trip to dairy farms | A. Note taking  
B. Discussion of needs  
C. Calculate and record the nutritional needs as stated in Feeds and Feeding, Table III for the given heifer and dry cow. | E. Teacher evaluation  
B. Prepare a written examination using multiple choice questions and essay questions. |
## Objectives by Unit

### Unit 4 - Nutritional needs of the milking herd

**Objective #7**
Calculate the nutritional needs for given examples of milking cows in three different categories of production listed (1) production maintenance and growth (2) production, maintenance and pregnancy, (3) production and maintenance only.

**Factors**
- Body weight maintenance
- Pregnancy
- Production
- Growth

### Unit 5 - Feeding practices

**Objective #8**
List five ways for providing mineral supplements for dairy cattle.

**How can minerals be fed?**

**A. Ways of providing minerals for dairy cattle**
- Dry lot
- Pasture
- Full hay
- Full silage

**B. How can minerals be fed?**
- Block
- Granular
- Liquid
- Mixed with feed or free choice

**Objective #9**
Balance, to the instructor's satisfaction, a ration for a given situation concerning dry cow, three years old.

**A. Types of feed**
- Roughage
- Concentrates
- Mineral supplement

**B. Factors to consider**
- Body maintenance
- Pregnancy
- Production
### TEACHING METHODS

<table>
<thead>
<tr>
<th>A. Supervised study</th>
<th>B. Topic - Computerized calculations of feed formulation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Feed Company, Dairy Specialists, guest speakers, student panel consisting of students with dairy enterprises on the home farm and cooperative farms.</td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

| A. Calculate and record the nutritional needs of the cattle giving - Example; use feeds and feeding Table III Questions and answers and discussion |

### EVALUATION PROCEDURES

<table>
<thead>
<tr>
<th>A. Teacher evaluation of calculations by students B. Problem solving quiz</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>A. Field trip to dairy farm B. Field trip to feed store C. Supervised study</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>A. Compile and file the list of methods for supplying minerals and choose the one which most meets the students needs. B. Construction of a pasture mineral feeding container.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>A. Instructor's evaluation of calculated material</th>
</tr>
</thead>
</table>

### A. Supervised study   B. Feeds and Feeding Table III and Table I

<table>
<thead>
<tr>
<th>A. Find the needs of the animal B. Meet her needs through feeding basically roughage and supplement this with concentrates. Use an actual project animal or home farm or employee's animal when possible.</th>
</tr>
</thead>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #10</td>
<td>Balance, to the instructor's satisfaction, a ration for a given situation concerning a milking cow carrying a calf for five months.</td>
</tr>
<tr>
<td></td>
<td>A. Types of feed -</td>
</tr>
<tr>
<td></td>
<td>. Roughage</td>
</tr>
<tr>
<td></td>
<td>. Concentrates</td>
</tr>
<tr>
<td></td>
<td>. Mineral supplement</td>
</tr>
<tr>
<td></td>
<td>B. Factors to consider -</td>
</tr>
<tr>
<td></td>
<td>. Body maintenance</td>
</tr>
<tr>
<td></td>
<td>. Production</td>
</tr>
<tr>
<td></td>
<td>. Pregnancy</td>
</tr>
<tr>
<td>Objective #11</td>
<td>List the advantages of complete feeds in feeding dairy cattle.</td>
</tr>
<tr>
<td></td>
<td>A. What are complete feeds?</td>
</tr>
<tr>
<td></td>
<td>. Roughages</td>
</tr>
<tr>
<td></td>
<td>. Concentrates</td>
</tr>
<tr>
<td></td>
<td>B. How can complete feeds be used in dairy feeding programs?</td>
</tr>
<tr>
<td></td>
<td>C. Advantages of complete feeding programs</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study - Reference Feeds and Feeding Tables I and III</td>
<td>A. Find the needs of the animal B. Meet her needs through feeding basically roughage and supplement this with concentrates. C. Calculate for an actual project animal on home farm or employer's animal when possible. D. Analyze a tag from a bag of Dairy Ration.</td>
<td>A. Instructor's evaluation of calculated material.</td>
</tr>
</tbody>
</table>

| A. Classroom discussion B. Students take notes C. Invite farmers that are using the complete feed concept. | A. Apply the complete feeding concept on the home farm. | A. Written test on subject matter. |
Title - FEEDING DAIRY CATTLE

RESOURCE MATERIALS

       Animal Science

Bulletins: 1. Cornell Recommends, Cornell, IMS, Stone Hall
           2. Raising Dairy Calves and Heifers, Cornell Ext. 76
           3. Feed companies prepare bulletins which may be procured
              from local feed dealers.
           4. Feeding Dairy Cattle, Cornell

Periodicals: Farm Journal
             Successful Farming
             Hoard's Dairyman
             Pennsylvania Farmer

Audiovisuals: "Rumen Story" 1.Ralston-Purina Co.
              or St. Louis, Mo.
              2. Cornell Film Library
              Extension Service Specialist - Dairy Production
This module will prepare the student to set up a herd health and disease prevention program that will be satisfactory for a dairy herd. Emphasis is placed on the diagnosis and treatment of animals for specific conditions and diseases under direction and supervision of veterinarians. Sanitation and environmental controls will be examined and the necessary health records will be maintained. Students will also become familiar with state and federal regulations that pertain to sales of cattle and shipment of milk during treatment period.

DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocations</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of Disease Control</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Herd Health Problems</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Management for Disease Prevention</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>14</td>
<td>16</td>
</tr>
</tbody>
</table>

Revised January '75
Objectives to be obtained:

The student will be able to:

1. Define and show the economic importance of good herd health. Contrast the definition with that of disease, stress, condition.

2. Select and use reference materials on animal health conditions for identification of causal agents and means of spreading diseases.

3. Demonstrate to the instructor's satisfaction a knowledge of the 16 general symptoms, any one of which is an indicator that an animal is not in good health.

4. Demonstrate to the instructor's satisfaction a working knowledge of the causes, symptoms, treatment, control or prevention measures of 25 dairy cattle diseases, conditions or stresses by the instructor and of economic importance in our state or area.

5. Determine when a veterinarian should be called to treat dairy cattle and those services that go along with veterinarians services.

6. List 10 important sanitation and environmental control measures used for control or prevention of disease, condition or stress.

7. Demonstrate how to correctly prepare, use and analyze either the DHI health record or individual permanent record to prevent disease problems.

8. List procedures required to care for a sick or injured animal.

9. Plan a farm medicine chest. List minimum equipment and contents that should be kept on hand for dairy herd health use.

10. Name the state and federal regulation requirements for marketing milk and dairy animals.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1</strong>&lt;br&gt;Importance of Disease Control</td>
<td>A. Definition of good health as contrasted with disease, stress, condition.&lt;br&gt;B. Definition's development for:&lt;br&gt;  - Disease&lt;br&gt;  - Condition&lt;br&gt;  - Stress&lt;br&gt;C. Losses in income:&lt;br&gt;  - Production of milk&lt;br&gt;  - Animal losses&lt;br&gt;D. Costs:&lt;br&gt;  - Direct costs&lt;br&gt;    - drugs&lt;br&gt;    - veterinarian&lt;br&gt;    - other&lt;br&gt;  - Indirect&lt;br&gt;    - loss in milk not produced&lt;br&gt;    - loss in feed conversion&lt;br&gt;    - affect on food supply</td>
</tr>
<tr>
<td><strong>Objective 1</strong>&lt;br&gt;Define and show the economic importance of good herd health. Contrast the definition with that of disease, stress, condition.</td>
<td>A. Definition of good health as contrasted with disease, stress, condition.&lt;br&gt;B. Definition's development for:&lt;br&gt;  - Disease&lt;br&gt;  - Condition&lt;br&gt;  - Stress&lt;br&gt;C. Losses in income:&lt;br&gt;  - Production of milk&lt;br&gt;  - Animal losses&lt;br&gt;D. Costs:&lt;br&gt;  - Direct costs&lt;br&gt;    - drugs&lt;br&gt;    - veterinarian&lt;br&gt;    - other&lt;br&gt;  - Indirect&lt;br&gt;    - loss in milk not produced&lt;br&gt;    - loss in feed conversion&lt;br&gt;    - affect on food supply</td>
</tr>
<tr>
<td><strong>Objective 2</strong>&lt;br&gt;Select and use reference materials on animal health conditions for identification of causal agents and means of spreading disease.</td>
<td>A. Listing of available references on cattle disease&lt;br&gt;    - Texts&lt;br&gt;    - Periodicals&lt;br&gt;    - Slides&lt;br&gt;    - Tapes&lt;br&gt;B. Identification of causal organism for disease:&lt;br&gt;    - Bacteria&lt;br&gt;    - Virus&lt;br&gt;    - Fungi&lt;br&gt;    - Protozoa&lt;br&gt;    - Spores&lt;br&gt;    - Poisons&lt;br&gt;    - Feeds&lt;br&gt;    - Chemicals&lt;br&gt;C. Identification of means of disease spread&lt;br&gt;    - Direct contact&lt;br&gt;    - Indirect contact</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Lecture</td>
<td>A. Written definitions of good</td>
</tr>
<tr>
<td>B. Lecture-discussion-use of charts showing the costs related to disease control from direct and indirect reasons.</td>
<td>health. Disease-stress-condition</td>
</tr>
<tr>
<td>C. Tape interview of veterinarian and/or local farmers in discussion of losses. Directed study-Bull. 998-pgs 3-5</td>
<td>B. Student become aware of the economic problem—and include in the written notes or written work sheet</td>
</tr>
<tr>
<td>D. Examination of DHI monthly records of selected individual animals in herds to demonstrate losses in production as result of disease or condition as compared to animals free of disease or condition.</td>
<td>C. Student examination of their own herd situations if on DHI.</td>
</tr>
<tr>
<td>E. Examination of farm cash accounts from sample farm for expense of veterinarian services and drugs.</td>
<td>D. Student examination of farm cash account records to determine expense for veterinarian services and drugs.</td>
</tr>
<tr>
<td>F. Establishment of an average cost per cow for veterinarian and drugs from Farm Business Studies.</td>
<td>E. Comparison of home conditions to state or regional Farm Business Studies.</td>
</tr>
</tbody>
</table>

A. Lecture-Discussion—supervised study for general causes of health problems of livestock, and the environmental conditions that are conducive to the spread of disease within a herd or area.

A. Students will find available references and develop a list of disease references for class use.

B. Students prepare lists of agents that cause disease and the methods by which a disease can be spread.

A. Continuous evaluation during module to determine how frequently and with what competence Students use references. Oral or written quiz.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 2</strong>&lt;br&gt;Herd Health Problems</td>
<td><strong>A. General symptoms</strong>&lt;br&gt;• Appetite change&lt;br&gt;• Cessation of rumination&lt;br&gt;• Roughened hair coat&lt;br&gt;• Loss of hair&lt;br&gt;• Dull eye&lt;br&gt;• Loss of weight or condition&lt;br&gt;• Coughing &amp; nasal discharge&lt;br&gt;• Rise in body temperature&lt;br&gt;• Skin changes&lt;br&gt;• Respiration rate&lt;br&gt;• Abnormal gait&lt;br&gt;• Muscular tremors&lt;br&gt;• Consistency of manures&lt;br&gt;• Drop in milk production&lt;br&gt;• Abnormal milk&lt;br&gt;• Discharge from bowel or reproductive tract&lt;br&gt;• Pulse rate&lt;br&gt;• Urine</td>
</tr>
<tr>
<td><strong>Objective 3</strong>&lt;br&gt;Demonstrate to the instructor's satisfaction a knowledge of 16 general symptoms, any one of which is an indicator that an animal is not in good health.</td>
<td><strong>A. Infectious diseases</strong>&lt;br&gt;• Mastitis&lt;br&gt;• Brucellosis&lt;br&gt;• Trichomoniasis&lt;br&gt;• Leptospirosis&lt;br&gt;• Foot rot&lt;br&gt;• Metrites&lt;br&gt;• Cow pox&lt;br&gt;• Vibriosis&lt;br&gt;• Rabies&lt;br&gt;• Anthrax&lt;br&gt;• Black leg&lt;br&gt;• Shipping fever&lt;br&gt;• Pink eye&lt;br&gt;• Lumpy jaw&lt;br&gt;• Winter dysentery&lt;br&gt;• Warts&lt;br&gt;• Ringworm&lt;br&gt;• Tuberculosis</td>
</tr>
</tbody>
</table>
| **Objective 4**<br>Demonstrate to the instructor's satisfaction a working knowledge of the causes, symptoms, treatment, control or prevention measures of 25 dairy cattle diseases, conditions or stresses selected by the instructor of economic importance in our state or area. | **B. Metabolic conditions**<br>• Bloat<br>• Ketosis<br>• Edema<br>• Milk fever<br>• Retained fetal membrane<br>• Hardware<br>• Vitamin deficiencies<br>• Teat spider<br>**C. Parasites**<br>• Flies<br>• Lice<br>• Grubs<br>• Mange<br>**D. Poisons**<br>• Nitrate<br>• Prussic acid<br>• Grubs<br>• Mange<br>**E. Mechanical injury**<br>• Smashed teat<br>• Capped hip<br>• Broken bones<br>• Wounds
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture-discussion of when to call a veterinarian.</td>
<td>A. Supervised study</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Group discussion regarding what farmers and students should be able to treat.</td>
<td>B. Individual evaluation in diagnosis of animals symptoms</td>
<td>B. Continued diagnosis as in Objective #4</td>
</tr>
<tr>
<td>C. Tape or actual interview with area veterinarian.</td>
<td>C. Role playing-practice making call to veterinarian office leaving</td>
<td></td>
</tr>
<tr>
<td>Discussion of his role in herd health</td>
<td>information</td>
<td></td>
</tr>
<tr>
<td>Information needed both at the time of call and when at the farm</td>
<td>His evaluation of when individual should make his own treatments</td>
<td></td>
</tr>
<tr>
<td>D. Role playing using practice telephone for leaving message for veterinarian.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 5</td>
<td>A. Determining the value of animals in terms of cost required for treatment</td>
</tr>
<tr>
<td></td>
<td>. Diagnosis of condition</td>
</tr>
<tr>
<td></td>
<td>. Skills in administration medication</td>
</tr>
<tr>
<td></td>
<td>. Equipment available</td>
</tr>
<tr>
<td></td>
<td>. Desire of individual to do work</td>
</tr>
<tr>
<td></td>
<td>B. Determination of degree of sickness</td>
</tr>
<tr>
<td></td>
<td>. Pulse</td>
</tr>
<tr>
<td></td>
<td>. Temperature</td>
</tr>
<tr>
<td></td>
<td>. Alertness</td>
</tr>
<tr>
<td></td>
<td>. Respiration</td>
</tr>
<tr>
<td></td>
<td>. Other symptoms</td>
</tr>
<tr>
<td></td>
<td>C. Information given at time of call</td>
</tr>
<tr>
<td></td>
<td>. Who is calling</td>
</tr>
<tr>
<td></td>
<td>. Address or location</td>
</tr>
<tr>
<td></td>
<td>. Reason for call:</td>
</tr>
<tr>
<td></td>
<td>. symptoms</td>
</tr>
<tr>
<td></td>
<td>. when noticed</td>
</tr>
<tr>
<td></td>
<td>. what done so far</td>
</tr>
<tr>
<td></td>
<td>D. Veterinarian service at the farm</td>
</tr>
<tr>
<td></td>
<td>. Information available on animal</td>
</tr>
<tr>
<td></td>
<td>. Assistance for veterinarian</td>
</tr>
<tr>
<td></td>
<td>. Treatment to follow</td>
</tr>
<tr>
<td></td>
<td>. Record treatment data</td>
</tr>
</tbody>
</table>
### TEACHING METHODS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Lecture-discussion of general symptoms that effect animals which indicate something is wrong.</td>
</tr>
<tr>
<td>B.</td>
<td>Ditto list of symptoms and what to look for.</td>
</tr>
<tr>
<td>C.</td>
<td>Slides or pictures showing animals with various symptoms.</td>
</tr>
<tr>
<td>D.</td>
<td>Identification of the normal condition for these to include demonstrations for taking temperature, respiration, pulse.</td>
</tr>
<tr>
<td>E.</td>
<td>Field trip to farm for animal examination and demonstrations. Use local veterinarians as resource people.</td>
</tr>
<tr>
<td>F.</td>
<td>Supervised study and group discussion using references. Preparation of sheets for diseases and/or conditions.</td>
</tr>
<tr>
<td>G.</td>
<td>Slides and tapes of specific diseases</td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Demonstrate ability to take temperature, pulse, &amp; respiration rate through actual examination.</td>
</tr>
<tr>
<td>B.</td>
<td>Note taking of general symptom list.</td>
</tr>
<tr>
<td>C.</td>
<td>Students can visit livestock auctions and report on the visual appearance of cattle and calves.</td>
</tr>
<tr>
<td>D.</td>
<td>Students keep notebooks containing diseases, including causes, symptoms, treatment, controls, prevention. Include any updated statistics that relate to current economic losses.</td>
</tr>
</tbody>
</table>

### EVALUATION PROCEDURES

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Written test of listing the general symptoms.</td>
</tr>
<tr>
<td>B.</td>
<td>Demonstrate to instructor's satisfaction ability to accurately check: Temperature. Pulse rate. Respiration rate.</td>
</tr>
<tr>
<td>C.</td>
<td>Slide test of animals showing symptoms. Have students list symptoms shown in the slides.</td>
</tr>
<tr>
<td>D.</td>
<td>Student notebook evaluated for content on each of the diseases and/or conditions. Written test where at least 80% accuracy is required for disease causes, symptoms, treatment, controls, and prevention.</td>
</tr>
<tr>
<td>Unit 3</td>
<td></td>
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<tr>
<td>---------</td>
<td></td>
</tr>
<tr>
<td><strong>Management for Disease Prevention</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Objective 6</strong></td>
<td></td>
</tr>
<tr>
<td>List 10 important sanitation and environmental control measures used for control or prevention of disease, condition or stress.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CONTENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A.</strong> Proper sanitation measures to control dairy diseases.</td>
</tr>
<tr>
<td><strong>B.</strong> The list should contain items in the following general areas:</td>
</tr>
<tr>
<td>- Proper feeding</td>
</tr>
<tr>
<td>- Sanitation in buildings, yards, lanes, pastures</td>
</tr>
<tr>
<td>- Proper equipment in good working order</td>
</tr>
<tr>
<td>- Well maintained fences, yards and exercise area</td>
</tr>
<tr>
<td>- Ventilation of buildings</td>
</tr>
<tr>
<td>- Stall sizes</td>
</tr>
<tr>
<td>- Pens availability and size</td>
</tr>
<tr>
<td>- Isolation of sick or new animals</td>
</tr>
<tr>
<td>- Manure disposal</td>
</tr>
<tr>
<td>- Federal &amp; state disease control regulations</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Objective 7</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrate how to correctly prepare, use and analyze either the DHI health record or similar record for animal health.</td>
</tr>
</tbody>
</table>

| **A.** Information needed in health record |
| - From birth or when entered the herd if purchased replacements |
| - Identify |
| - Dates of disease-condition |
| - Treatment used |
| - Keep records current |
| **B.** Use and analysis of the health record |
| - Past condition that may repeat |
| - Frequency of a condition as mastitis or milk fever or bloat |
| - Breeding history particularly estrous periods |
| **C.** Temporary and permanent records |
| - Barn-type sheets |
| - Permanent cards and/or records |
| - Wheel-type of breeding record |

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# Teaching Methods

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Lecture-discussion after study period.</td>
</tr>
<tr>
<td>B.</td>
<td>Slides showing desired environment</td>
</tr>
<tr>
<td>C.</td>
<td>Tape interview with veterinarian in regard to sanitation and environmental factors</td>
</tr>
<tr>
<td>D.</td>
<td>Field trips to farms (prefer two situations, one farm in 40-60 cow range and the other a large operation in the 150-200 cow range) for comparison of operations. Develop score card of &quot;yes&quot;-&quot;no&quot; conditions of sanitation and environmental factors similar to &quot;Barn Score Card&quot; used by milk company.</td>
</tr>
</tbody>
</table>

# Student Application Activities

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Students prepare list of sanitary and environmental control measures desired for farm. Students score farms as to &quot;yes&quot; or &quot;no&quot; of their developed list.</td>
</tr>
<tr>
<td>B.</td>
<td>Lecture demonstration of methods used in keeping of health records both for DHI and for other types of health record forms or cards (see appendix)</td>
</tr>
<tr>
<td>C.</td>
<td>Student problem solving situations, keeping records and evaluation of situations in terms of planning for coming year.</td>
</tr>
<tr>
<td>D.</td>
<td>Field trips to farms where systematic records of health and/or breeding are maintained.</td>
</tr>
</tbody>
</table>

# Evaluation Procedures

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Written test</td>
</tr>
<tr>
<td>B.</td>
<td>Students practice filling out records on animals using DHI forms and other types of health records.</td>
</tr>
<tr>
<td>C.</td>
<td>Students analysis of problem situations and prepare plans to prevent problems from getting established.</td>
</tr>
<tr>
<td>D.</td>
<td>Given situations to teacher's satisfaction that student can maintain, use, and analyze.</td>
</tr>
<tr>
<td>E.</td>
<td>Given sample DHI health records students will evaluate the records indicating strengths and weaknesses of animals.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 8</td>
<td></td>
</tr>
</tbody>
</table>
| List procedures required to care for sick or injured animals. | A. Basic diagnosis  
|                   |   . Temperature  
|                   |   . Pulse  
|                   |   . Respiration  
|                   | B. Getting animal isolated  
|                   |   . Leading  
|                   | C. Management  
|                   |   . Blanketing  
|                   |   . Feeding & watering  
|                   | D. Administering antibiotics  
|                   |   . Drenching  
|                   |   . "bougies"  
|                   |   . Shots  
|                   |   . Balling gun  
|                   | E. Other skills associated with treatment  
|                   |   . Casting  
|                   |   . Bandages  
|                   |   . Restraining  
|                   |   . Block & tackle or jacks  
|                   |   . Handling feet  
|                   |   . Use of electric prods  
|                   |   . Trocar & cannula  
|                   | F. Safety in handling animals  
|                   |   . Personal  
|                   |   . Animal involved  

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
</table>
| A. Demonstration by veterinarian recommended where teacher does not have experience (Under no circumstances should teacher undertake treatment of an animal unless he is absolutely sure of his ability). | A. Observation of demonstrations in some cases students may be allowed to practice handling the animals as restraining, feet work and locating where shots would be administered.  
B. Observe veterinarians work on farm cattle. | A. Written test  
B. Notes taken for completeness.  
C. Evaluation of student practice in handling of animals when being treated. |
| B. Field trip to farm where demonstrations and practice may be carried out where facilities exist for proper handling of animals. |                                                                                               |                                                                                       |
| C. Supervised study using references in regard to basic diagnosis, isolating animals, management, treatment and handling animals. |                                                                                               |                                                                                       |
Objective 9
Plan a farm medicine chest. List minimum equipment and contents that should be kept on hand for dairy herd health use.

<table>
<thead>
<tr>
<th>A. Equipment</th>
<th>B. Medicine and materials</th>
<th>C. Drugs that are fresh that may be prescribed by veterinarian for use as:</th>
<th>D. Problems of keeping medical chests:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nose lead</td>
<td>Turpentine</td>
<td>Sulfa drugs</td>
<td>Space requirements</td>
</tr>
<tr>
<td>Cow halter</td>
<td>Absorbine</td>
<td>Destrose</td>
<td>Location of chests</td>
</tr>
<tr>
<td>8ft. length sash cord</td>
<td>Ginger (tea)</td>
<td>Calcium gluconate</td>
<td>Type of chest</td>
</tr>
<tr>
<td>Drench bottle</td>
<td>Mineral oil</td>
<td>Mastitis antibiotics</td>
<td>Safety</td>
</tr>
<tr>
<td>Trocar &amp; cannula</td>
<td>Vaseline</td>
<td>Antibiotics</td>
<td></td>
</tr>
<tr>
<td>Balling gun</td>
<td>Alcohol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypodermic needle</td>
<td>Disinfectants</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>CONTENT</th>
<th>CONTENT</th>
<th>CONTENT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>40' length of 1/4&quot; rope</td>
<td>Electric clippers</td>
<td>Epson salts</td>
<td>Tincture of iodine</td>
</tr>
<tr>
<td>Dehorning equipment</td>
<td>Wash basin</td>
<td>Udder balm</td>
<td>Sterile cotton</td>
</tr>
<tr>
<td>Hoof knife</td>
<td>Thermometer</td>
<td>Castor oil</td>
<td>Sterile gauze</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>bandages</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture-discussion of the equipment and supplies</td>
<td>A. Students prepare list of equipment needed for medical chest</td>
<td>A. Oral test of equipment and what items are</td>
</tr>
<tr>
<td>needed for herd health based on group observations</td>
<td>together with costs of items.</td>
<td>to be used for.</td>
</tr>
<tr>
<td>and study of specific diseases.</td>
<td>B. Students prepare an actual chest for demonstration purpose as</td>
<td>B. Written test.</td>
</tr>
<tr>
<td>B. Slides showing well equipped medical chest and</td>
<td>an open house or fair exhibit.</td>
<td></td>
</tr>
<tr>
<td>contents Observations of equipment on field trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>taken previously in module.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Study of drug information and package labels as</td>
<td></td>
<td></td>
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<tr>
<td>to strength, use, and dosage recommendations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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<td></td>
</tr>
<tr>
<td>Objective 10</td>
<td>A. Marketing cattle</td>
<td></td>
</tr>
<tr>
<td>Name the state and federal regulations requirements for the marketing of cattle, milk and dairy animals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Marketing milk</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Marketing dairy animals</td>
<td></td>
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<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**A. Marketing cattle**
- Intra-state shipment procedure
- Inter-state shipment procedure

**B. Marketing milk**
- Barn conditions
- Yard and pasture conditions
- Equipment and facility sanitation
- Cattle health requirements
  - Ring test
  - Health examinations
  - TB testing
- Antibiotics and withholding milk

**C. Marketing dairy animals**
- Antibiotic restrictive
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture discussion of regulations regarding sales of animals at both public and private sale. Examination of sale catalogs for health regulations.</td>
<td>A. Notes taken on the requirements for cattle sales—health requirements and milk market regulations.</td>
<td>A. Written test.</td>
</tr>
<tr>
<td>B. Tape interview with veterinarian and/or local cattle dealer in regard to livestock.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Lecture discussion of health &amp; sanitation regulations of local milk companies. Guest speaker area field man or inspector for state and federal market regulations of local milk company.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Examination of written health regulations for the federal &amp; state marketing health regulations.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Title - DAIRY HEALTH AND DISEASE

RESOURCE MATERIALS

Books:
Dairy Cattle Science - M.E. Ensminger, Interstate, Danville, Illinois
Modern Dairy Cattle Management - Davis, Prentice Hall
Yearbook of Agriculture 1956 - Disease
Animal Health Handbook - Pfizer
Agriculture in Our Lives - Kerbs, Interstate
Approved Practices in Dairying - Mortenson & Juergensen, Interstate
Feeds & Feeding - Morrison
The Science of Dairy Farming - H.R. Webster Feed Company
Profitable Dairy Management - Beacon Feed Company
Hoards Dairyman Herd Health Book - W.D. Hoard

Bulletins:
A Dairy Herd Health Program. Dairy herd disease control committee of N.Y. State Veterinary Medical Society
Programmed Dairy Herd Health. Smith D.V.M., Canton Ag. & Tech.
Anchor Veterinary Handbook - latest edition

Periodicals:
Hoards Dairyman Magazine

Audiovisuals:
Mastitis - Slide Set - I.M.S.
The Permanent Record Card for Dairy Cattle was designed for use as a permanent, complete, life record of a dairy cow in either a grade or registered herd. The record was designed primarily for use in herds that develop their own herd replacements from cows that have demonstrated their superior ability for milk production, type characteristics, and health.

This record meets the requirements of herd records in that it is convenient, compact, and will supply most of the desired information about an individual animal. The record is convenient to use in that it can readily be filed in a file box or carried in a shirt or jacket pocket. It is compact as well. Approximately one-hundred cards can be filed in one inch of space. If further information is needed a regular 5" x 8" card can be attached to the record and the file will remain neat and orderly.

The record lends itself to the selling of cattle for reasons that the record can be reproduced in advertising mediums. It tends to be more businesslike to have a single record with all information available when showing a prospective buyer the animal. When a sale is made, either at public or private treaty, a copy of the record should be made available to the buyer while the original card remains in the permanent records.

The health record is designed to be kept up to date as needed. This is of great value when studying individual animals or families for health problems. Where the code would not cover the conditions in the herd further codes can be developed. It would be suggested that an explanation of the code additions be made at the end of the code information on all cards so noted.

The record card provides spaces for all information regarding an animal that is of primary importance to the dairyman. However, as with any record, to be of the greatest value the record must be kept up to date. This means that as events take place they should be recorded. This is especially true in the health record and including the breeding information. The record will be only as valuable as the farmer wishes to make the record.

Over a period of years the record will show the gains in the breeding program. The records will show the desirable cow families and individuals that can transmit, or have transmitted over the years. The column for herd average for the year is in itself the best means of answering the cull-keep question.

The information below and in the following pages are the instructions for keeping the record card.

A. FRONT OF THE CARD

1. IDENTIFICATION INFORMATION:
   a. Cow - The name of the animal whose record is to follow. (For registered cows, the registration number would be written below the name.)
   b. Birth - The date of birth written in figures (month-day-year).
   c. Disposal - The date of disposal of the animal in figures.
   d. Ear Tag - The ear tag number of the animal (registration number if not entered).
   e. Record No. - This is the animal's individual number which is never repeated. The first number is 1 and following forward.

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DCP-12 (2) Permanent Records (contd)

e. Dam - The name of the mother of the animal
f. No. - The number of the dam. (That is the dam's record number from her file card)
g. Sire - The name of the father of the animal. (This could be the sire's code name if used in artificial insemination).
h. NS-AS Check (✓) if the animal was sired by natural (NS) or artificial (AS) service.
i. R-G Check (✓) if the animal is registered (R) or a grade (G).

2. PRODUCTION RECORD INFORMATION

a. Yr. - The calendar year that the record was begun.
b. Mos. - The age of the animal in months or years and months at the time the record was begun.
c. Weight - The weight of the animal during the lactation period (at the beginning of the record).
d. Days Recd. - The number of days that the animal was milked in the lactation.
e. Days Dry - The number of days that the animal was dry at the end of the lactation and before freshening to start a new lactation.
   (Records are figured from freshening date to freshening date)
f. *Prod. Milk - The total milk produced in pounds for the lactation.*
g. *Lbs. Fat - The total butterfat produced during the lactation.*
   (*Both the milk and fat production can be expressed as either actual production or as mature equivalent 2 X. However, whichever is used the herd average should also be the same. Further comments will be expressed below)
i. Total value - The calculated returns based on the price of milk for the year.
j. Feed costs - The calculated costs of all feeds (grain-hay-silage-pasture) for the year.
k. Returns - The profit or loss expressed as a (+) or a (-).
l. Herd Average - The calculated herd average for the herd minus the animal's production record. For larger herds the average should reflect the season of the year in which the animal freshened (Mar.-Aug. Sept.-Jan.). (This column has the greatest use in determining the cull or keep on the animal in question.)
   (The records here should be in the mature basis. If the animal's record above is based on the actual then the mature record 2 X 305 should be placed in the remarks section next to the herd average.)

3. REPRODUCTION RECORD INFORMATION

*a. Date Bred - The date that is the service date resulting in conception
b. Sire - The sire that was the parent of the calf
c. Cow's Wt. - The weight of the cow at the time of calving
d. Calf's Wt. - The weight of the calf by tape or the number inches of heart girth
e. Sex - Either male or female as M or F
f. Date/Method Disposal - The date that the animal left herd with the reason or method of disposal (if lacking room for materials put in remarks)
g. Name - The name of the animal together with its code and registration date (if registered) only if animal is going to be raised as herd replacement
h. Remarks - If there is any problem of calving it should be entered here. If the animal was sold the price and new owner's name should be entered. If bad calf then the price received would be entered.

*Transfer material from breeding records of the herd to this sheet.
4. HEALTH AND BREEDING RECORDS INFORMATION

a. This record is to be kept on the animal beginning at birth and continuing through the time that the animal leaves the herd. Entries are made in the correct year column and on the line for the correct month. The entry consists of the date of the month and the code letter for the condition.

   1. Examples: a) PE/6 - Physical Examination  B/3 Birth

b. Where treatment is not suggested by the code enter the letter "T" and the date as "T/10a"/. The small letter refers to any remark that is necessary and should be entered in the remarks at the bottom of the card. Be sure to include the small letter at the beginning of the information.

c. If it is desired further development of the code is possible to cover conditions not included in the list. It should be suggested that such additions to the code be added to the end of the code list.

5. MISCELLANEOUS INFORMATION

a. Reason for Disposals: - The general or specific reason for the removal of the animal from the herd.

b. Weight at Birth: - The weight of the animal when it was born either in pounds or inches of heart girth.


d. Remarks:

   1. materials to include in this section:

   a. type scores and classification
   b. show records and awards
   c. special honors of the breed
   d. price paid and from whom purchased together with the date of the purchase
   e. the price received, date and name and address of the buyer if sold as a herd replacement
   f. medical treatment not covered in the Health and Breeding Record

The record card presents a place for all necessary information that would be needed by a farmer raising his own herd replacement. The farmer has only to make the entries as they arise. It would be suggested that such entries be taken care of at the time the event took place. DO IT NOW AND DO NOT PUT IT OFF, BECAUSE IF YOU DO IT PROBABLY WILL NEVER GET DONE. THE VALUE OF THIS OR ANY RECORD IS COMPLETENESS OF THE INFORMATION. THE HERDSMAN IS RESPONSIBLE TO SEE THAT THE INFORMATION IS THERE.
COW

Birth Disposal Eartag Record No.

DAM No. Sire.

PRODUCTION RECORDS

<table>
<thead>
<tr>
<th>YEAR</th>
<th>MOS.</th>
<th>COW'S WEIGHT</th>
<th>DAYS REC'D.</th>
<th>DAYS DRY</th>
<th>PROD</th>
<th>WEIGHT</th>
<th>FAT</th>
<th>TOTAL VALUE</th>
<th>FEED COSTS</th>
<th>RETURNS</th>
<th>HERD AV.</th>
<th>REMARKS</th>
</tr>
</thead>
</table>

REPRODUCTION RECORD

<table>
<thead>
<tr>
<th>DATE BREED</th>
<th>SIRE</th>
<th>DATE FRESH</th>
<th>COW'S WEIGHT</th>
<th>Calf's Weight</th>
<th>SEX</th>
<th>Date/Method DISPOSAL</th>
<th>NAME</th>
<th>REMARKS</th>
</tr>
</thead>
</table>

HEALTH AND BREEDING RECORD

<table>
<thead>
<tr>
<th>MO.</th>
<th>YR.</th>
<th>50</th>
<th>60</th>
<th>61</th>
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<tbody>
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</tbody>
</table>

Code: B, birth; PE, phy. exam; A, abortion; H, heat; BA, artif. bred; BN, natural service; C, calving; P, pregnancy exam; A/B, afterbirth; B/T, bangs test; T/B, tb. test; S, scours; M, mastitis; F, foot problem; M/F, milk fever; O/F, off feed; T/H, heat treatment; V, vaccination; K, ketosis; C/O, cystic ovary; V/T, vibrosis; D, drydate; T, other treatment; DI, disposal; IM, immunation.

REASON FOR DISPOSAL:  

WEIGHT AT BIRTH: 90  

BIRTH PROBLEMS: None - Normal birth

REMARKS  

Remarks

K5 - Farrowing lag,  
Vet. treatment for vaginitis - People failed,  
Mastitis - Child,  
Too Pinky,  
Blat.
The milking herd is of extreme importance in the business of dairy farming. It is composed of the animals which consume the most roughage, and concentrates in the herd. These animals create the highest medical costs in the herd, and they are the only ones producing a return both in revenue from their product, and in their individual value. Good management of this segment of the dairy herd is essential for a profitable business.

Students enrolled in this module will be primarily involved with the care and feeding of the dairy herd, the use of production, and health records to maintain the profit balance of the milking herd. Efficiency of cow numbers vs. labor and buildings will also be emphasized.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Care and handling</td>
</tr>
<tr>
<td>Housing needs</td>
</tr>
<tr>
<td>Essential records</td>
</tr>
<tr>
<td>Feeding</td>
</tr>
<tr>
<td>Labor Management</td>
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<td></td>
</tr>
</tbody>
</table>

Revised January '75
Title - MANAGING THE MILKING HERD

OBJECTIVES to be obtained:

The student will be able to:

1. List 10 steps to be followed in a program for care of the individuals of the milking herd.
2. Milk a cow to the satisfaction of the instructor or cooperative farmer.
3. Recognize and remedy, to the instructors satisfaction, symptoms of at least six bodily malfunctions which could involve the milking cow.
4. List the recommended spacial requirements per head for (a) cows in loose housing, and (b) cows housed in conventional stables.
5. List six essentials of a good housing sanitation program.
6. Complete examples of production, breeding, health, and account records for each of two given situations.
7. Determine, to the instructors satisfaction, the amount of forage, and concentrates to be fed per animal per day (in a given situation) using production record information, when the cow is on a dry lot feeding program.
8. Determine, to the instructor's satisfaction, the amount of feed supplement to be fed per animal (in a given situation) using production record information, when the cow is on a grazing program.
9. Determine the number of cows one man can handle efficiently.
10. Develop an incentive program which would tend to make a hired man want to stay with the business.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Unit 1. Care and Handling  
Objective 1  
List 10 steps to be followed in a program for care of the individuals of the milking herd | A. Factors to consider in the care and handling of cows  
B. Regularity of  
   - Feeding  
   - Cleaning  
   - Milking  
C. Health  
D. Ventilation  
E. Sanitation  
F. Personal stability of handler  
G. Judgement of handler |
| Objective 2  
Milk a cow to the satisfaction of the instructor or a cooperating farmer | A. Explain the milk secretion process  
   - Observation  
   - Practice |
| Objective 3  
Recognize and remedy, to the instructors satisfaction, symptoms of at least six bodily malfunctions which could involve the milking cow | A. Diseases  
   - Milk fever  
   - Acetanemia  
   - Cow pox  
   - Mastitis  
   - Foot rot  
   - Hardware  
B. Injuries  
   - Cuts  
   - Bruises  
   - Internal  
C. Other  
   - Upset stomach  
   - Pests  
D. Mastitis  
   - Chronic  
   - Acute |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study, assign questions, have students look up answers to questions</td>
<td>A. Note Taking</td>
<td>A. Oral or Written Test Name or list 10 steps to be followed in caring for the individuals of the milking herd.</td>
</tr>
<tr>
<td>B. Classroom discussion</td>
<td>B. Make the required list using the references available.</td>
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<tr>
<td></td>
<td>A. Field trip to dairy farm at milking time.</td>
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<tr>
<td></td>
<td>B. Demonstration Individual instruction</td>
<td></td>
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<tr>
<td></td>
<td>C. Slides—The Cows Udder and How it Functions</td>
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<tr>
<td></td>
<td>D. Film—The Science of Milk Production Rallston—Purina</td>
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</tr>
<tr>
<td></td>
<td>A. Supervised Study</td>
<td>A. Observation of demonstrated procedure.</td>
</tr>
<tr>
<td></td>
<td>B. Demonstration of techniques used in observing cattle.</td>
<td>B. Practice the procedure.</td>
</tr>
<tr>
<td></td>
<td>C. Field trip to dairy farm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Slides on Mastitis Cornell IMS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Complete a list of diseases and malfunctions common to the dairy herd. List the causes, symptoms, and controls of each.</td>
<td>A. Properly milk the cow to the instructors satisfaction or that of a cooperating farmer</td>
</tr>
<tr>
<td></td>
<td>B. Observe demonstration</td>
<td></td>
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<td></td>
<td>C. Practice techniques for detection of malfunctions</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>A. Written evaluation by the instructor.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Instructors evaluation of the students ability to recognize symptoms of at least 6 malfunctions.</td>
<td></td>
</tr>
</tbody>
</table>

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### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 2 - Housing Needs</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 4</td>
<td></td>
</tr>
</tbody>
</table>
| List the recommended spacial re-requirements-per-head-for-both-the conventional type and loose types of housing for the milking herd. | A. Conventional Barn  
  - Stanchion  
  - Tie Stall  
  - Length  
  - Width  
B. Loose Housing  
  - Free stall  
  - Loafing area |

| Objective 5            |         |
| List six essentials of a good housing sanitation program | A. Freeness of obstructions  
B. Ventilation  
C. Pest Control  
D. Restriction of visitors  
E. Cleanliness  
F. Isolation |

<table>
<thead>
<tr>
<th>Unit 3 Essential records</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 6</td>
<td></td>
</tr>
</tbody>
</table>
| Complete examples of production, breeding, health, and account records for each of two given situations. | A. Breeding record form  
B. Health record form  
C. DHIC records  
D. Business records  
E. Emphasize DHIC or OS Records. |

<table>
<thead>
<tr>
<th>Unit 4 - Feeding</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 7</td>
<td></td>
</tr>
</tbody>
</table>
| Determine, to the instructors satisfaction, the amount of forage and concentrates to be fed per day (in a given situation) using production record information, when the cow is on a dry lot feeding program. | A. Roughage  
  - Corn silage  
  - Hay  
B. Concentrates  
  - Grains used  
  - Protein supplement  
C. Amounts needed by individual animals |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised Study</td>
<td>A. Compile and record spatial requirements for both conventional and loose stabilizing systems.</td>
<td>A. Teachers evaluation of list of requirements</td>
</tr>
<tr>
<td>B. Field trips to area farms</td>
<td></td>
<td>B. Field trip reports</td>
</tr>
<tr>
<td></td>
<td>B. Design a new barn or design a remodeled old barn</td>
<td></td>
</tr>
<tr>
<td>A. Supervised Study</td>
<td>A. Research in groups of 2 and prepare a class report for one essential of a good sanitation program.</td>
<td>A. Oral or written test on the essentials of good sanitation program</td>
</tr>
<tr>
<td>B. Lecture</td>
<td>B. Note taking on peer reports and lecture.</td>
<td>B. Teacher evaluation of completed record forms</td>
</tr>
<tr>
<td>C. Field trip</td>
<td></td>
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</tr>
<tr>
<td>A. Lecture - use of each record</td>
<td>A. Note taking</td>
<td>A. Teacher evaluation of completed record forms</td>
</tr>
<tr>
<td>B. Demonstration in use of each record</td>
<td>B. Complete records for the teacher-given situations</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice on given situations</td>
<td></td>
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</tr>
<tr>
<td>A. Preparation of mimeograph charts to be used in acquiring information found in content</td>
<td>A. Use charts and references to determine the amounts to be fed for the given situation</td>
<td>A. Examination using adequate references Solve two problems related to T.D.N &amp; D.P. requirements.</td>
</tr>
<tr>
<td>B. Demonstration of the use of these charts</td>
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<tr>
<td>C. Guest speaker — Extension specialist or Feed Co. - Fieldman</td>
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<td>D. Supervised study</td>
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<tr>
<td>E. Chalk &amp; Board for problem solving</td>
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<tr>
<th>OBJECTIVES BY UNIT</th>
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<tbody>
<tr>
<td><strong>Objective 8</strong></td>
<td><strong>A. Roughage</strong></td>
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<tr>
<td>Determine, to the instructor's satisfaction, the amount of feed supplement to be</td>
<td>- Corn silage</td>
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<td>fed per animal (in a given situation) using production record information, when</td>
<td>- Hay</td>
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<td>the cow is on a grazing program.</td>
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<td><strong>B. Concentrates</strong></td>
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<td>- Grain used</td>
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<td>- Protein supplement</td>
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<td><strong>C. Amounts needed by individual animal</strong></td>
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<tr>
<td><strong>Unit 5 - Labor Management</strong></td>
<td><strong>A. Factors:</strong></td>
</tr>
<tr>
<td><strong>Objective 9</strong></td>
<td>- Type of handling system</td>
</tr>
<tr>
<td>Determine the number of cows one man could handle efficiently</td>
<td>- Other jobs required of the individual</td>
</tr>
<tr>
<td></td>
<td>- Average milk cows per man in area</td>
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<td></td>
<td>- Average milk cows per man in State</td>
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<td></td>
<td>- Average milk cows per man of farms of students in class</td>
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<td>- Recommendations by the State College of Agriculture</td>
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<tr>
<td><strong>Objective 10</strong></td>
<td><strong>A. Purpose of plan</strong></td>
</tr>
<tr>
<td>Develop an incentive program which would tend to make a hired man want to stay</td>
<td><strong>B. Types of incentives</strong></td>
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<tr>
<td>with the business.</td>
<td>- Production</td>
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<td>- Increase equity</td>
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<td>- Profit sharing</td>
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<td><strong>C. Principles for success</strong></td>
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<td></td>
<td>- Items creating employee interest</td>
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<td>- Training - preparation to do job as employer wishes</td>
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<td><strong>D. Consistency</strong></td>
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<td><strong>Title</strong> - Farm Manager, Farm Mechanic, Herdsman</td>
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<td>Delegation of Authority</td>
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<td>Wages - Competitive, tangible</td>
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<td>Working hours</td>
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<td>House</td>
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<td>Farm products - beef, milk</td>
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<td>Incentives and involvements</td>
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<td>Weekends and vacations</td>
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<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-------------------------------------------------------------------------------------------------</td>
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<tr>
<td>A. Use mimeo charts prepared for Objective #7.</td>
<td>A. Use charts and references to determine the amounts to be fed for the given situation</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Make calculations for own herd</td>
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<tr>
<td>C. Chalk and Board</td>
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<tr>
<td>. Work out problems</td>
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<tr>
<td>A. Supervised study</td>
<td>A. Determine the number of animals which can be handled per man in each of these situations.</td>
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<tr>
<td>B. Guest speaker—Coop. Ext. Specialist</td>
<td>. Milk cows—and no other jobs</td>
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<td>. Milk cows and care for calves and young stock</td>
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<td></td>
<td>. Milk cows—calves &amp; young stock, &amp; soil preparation</td>
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<tr>
<td>A. Discussion of problem</td>
<td>A. Preparation of sample incentive plan</td>
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<td>B. Supervised study—inecent</td>
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<td>C. Guest speaker of a successful operation and his employee</td>
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<tr>
<td>D. Lecture</td>
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<td>A. Note Taking</td>
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<td>. Compile a list of items which can be used to create employee interest and longevity</td>
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<td>. Select the one which can be of the most benefit</td>
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</tbody>
</table>
Module of Instruction

Title: Managing the Milking Herd

Code: 01.010101-05

Resource Materials

Books:
- Modern Dairy Cattle Management, Davis, Prentice Hall
- Dairy Production, Diggins and Bundy, Prentice Hall
- Successful Dairying, Knodt, McGraw Hill
- Feeds and Feeding Abridged, Morrison, Morrison Publishing Co.
- Dairy Cattle Selection and Feeding, Yapp and Nevens, Wiley

Bulletins:
1. Any available from local feed companies, especially on housing.
2. Farm business chart - I.M.S. Cornell University, Stone Hall, Ithaca, N.Y.
3. Health record from I.M.S. Cornell University, Stone Hall, Ithaca.
4. Incentive Programs for Hired Man, Ag. Ext. 49
5. Managing the Dairy Herd (unit for teachers) I.M.S., Cornell Univ. Stone Hall

Periodicals:
- Successful Farming
- Hoards Dairyman
- Farm Journal
- Pennsylvania Farmer

Audiostreams:
- Consult Cornell IMS List.

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## TERMS OF EMPLOYMENT
FOR YOUR HIRED HELP
(check sheet)

<table>
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<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Comment</th>
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<td>Output of products per man above average</td>
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<tr>
<td>Wages above average</td>
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<td>Social Security</td>
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<td>Running water</td>
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<td>Central heating</td>
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<tr>
<td>Electricity</td>
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<td>Telephone</td>
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<tr>
<td>Fuel</td>
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<tr>
<td>Milk</td>
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<tr>
<td>Meat</td>
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<tr>
<td>Eggs</td>
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<tr>
<td>Fruit and vegetables</td>
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<td></td>
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<tr>
<td>Other</td>
<td></td>
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<tr>
<td>Incentive payments</td>
<td></td>
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<tr>
<td>Regular working hours</td>
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<tr>
<td>Vacation with pay</td>
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<tr>
<td>Workman's insurance</td>
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<tr>
<td>Health insurance</td>
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<tr>
<td>Unemployment insurance</td>
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<tr>
<td>Written agreement, annual review</td>
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</tbody>
</table>
Title - BEEF PRODUCTION

DESCRIPTION:

Beef makes up a major portion of the American diet. A steady diet of good beef has been proven beneficial for body growth in human beings. The American public demands quite often exceed the supply since it has grown to realize the ability of beef to provide the high amount of protein needed for human growth and development. The price of beef has increased directly with its demand, resulting in a need for an increased amount of beef produced.

This module will involve the student in the development of skills needed to maintain a successful beef operation. The student will develop the skills needed for selecting, starting, and finishing beef for human consumption.

The skills of selecting, castrating, dehorning, clipping, hoof trimming, treating diseases and fitting and showing beef cattle will be emphasized.

Field trips to beef farms, and slaughter and packing facilities will be used to familiarize the student with other segments of this industry.

MAJOR DIVISIONS OR UNITS OF CONTENT

1. Breeding and Selection of Beef Animals.
   Time Allocations
   Class  Other
   2      3

2. Beef Health
   2      3

3. Feeding, growing and fitting beef
   2      6

4. Housing requirements and equipment
   2      3

5. Finishing and marketing
   2      5
   10     20

Revised June, 1974
Title - BEEF PRODUCTION

OBJECTIVES to be obtained:

The student will be able to:

1. Recognize by sight and list from memory the breed and origin of at least six beef breeds of cattle.

2. Compose to the instructors satisfaction, and send a letter requesting information concerning cattle pedigree registration, and artificial insemination restrictions to at least one beef breed association.

3. Name and recognize by sight at least five crosses and other varieties presently being used for beef. Select the one of most interest to you, and describe its origin and two reasons for its use.

4. List from memory 25 parts of the beef cow.

5. List ten of the twelve factors to be considered when judging or selecting beef cattle.

6. Judge with at least 50% accuracy three classes of beef cattle.

7. List and record causes, symptoms and controls of at least 20 diseases found in beef cattle.

8. Outline a health program for beef cattle.

9. Organize a program to follow for feeding beef from birth to six months of age.

10. Organize a program to follow for feeding beef breeding stock from six months of age to maturity.

11. Organize a program to follow for feeding beef from six months of age to finish.

12. Demonstrate the ability to fit a beef animal for show.
OBJECTIVES to be obtained:

(continued)

13. Diagram a housing arrangement for a given number of cattle, including a breakdown of total cost of construction, and show the method of calculating the capacity.

14. Select the type of feeding and watering system to be used for raising beef, and list five reasons why this one was selected.

15. Name the feeding system to be used in finishing beef for market, and list two reasons for quality differences.

16. Locate five facilities available for marketing the finished product.
## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 1 - Breeding and Selection of Beef Animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1</td>
</tr>
</tbody>
</table>

### CONTENT

- **A. Breeds of beef cattle**
  - Aberdeen Angus - Scotland
  - Red Angus - U.S.
  - Hereford - British Isles
  - Polled Hereford -
  - Brahman - India
  - Charolais - France
  - Semintal - Northern Europe
  - Santa Gertrudis - U.S.
  - Shorthorn - British Isles
  - Polled Shorthorn -

- **Objective 2**
  - The student will compose, to the instructor's satisfaction and send a letter requesting information concerning cattle pedigree registration and artificial insemination restrictions to at least one beef association.

### CONTENT

- **A. Necessary information**
  - Breed characteristics
  - Pedigree structure
  - A.I. restrictions
  - Interrelationship of parents' abilities
  - Basic requirements for letters (review)
<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Research and discover origin of each breed. A. Written or oral test. Name the breed and origin of the breeds of beef cattle.</td>
<td></td>
</tr>
<tr>
<td>B. Slides of examples of each breed.</td>
<td>B. Make a chart showing the following information for each breed. Origins: date of first importation, average mature weight, average marketing weight, average birth weight, average weaning weight.</td>
<td></td>
</tr>
<tr>
<td>D. Use of available magazines</td>
<td>A. Note taking. Write a letter to a breed association requesting information about requirements for registration.</td>
<td></td>
</tr>
<tr>
<td>A. Lecture</td>
<td>A. Note taking. Write a letter to a breed association requesting information about requirements for registration.</td>
<td></td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>A. Instructor's evaluation of written letter.</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 3</td>
<td>A. Cross breeds</td>
</tr>
<tr>
<td></td>
<td>Santa Gertrude's - Brahman x Shorthorn</td>
</tr>
<tr>
<td></td>
<td>Brahma x Charolais</td>
</tr>
<tr>
<td></td>
<td>Beefmaster - Brahman x Hereford x Shorthorn</td>
</tr>
<tr>
<td></td>
<td>Charbray - Charolais x Angus</td>
</tr>
<tr>
<td></td>
<td>Charolais x Hereford</td>
</tr>
<tr>
<td>Objective 4</td>
<td>A. Dairy Beef</td>
</tr>
<tr>
<td></td>
<td>Large boned dairy breeds weighing over 100 lbs. at birth.</td>
</tr>
<tr>
<td></td>
<td>Usually Holsteins</td>
</tr>
<tr>
<td>Objective 5</td>
<td>A. Factors to consider -</td>
</tr>
<tr>
<td></td>
<td>Purebred or grades</td>
</tr>
<tr>
<td></td>
<td>Selection of breed</td>
</tr>
<tr>
<td></td>
<td>Size of herd</td>
</tr>
<tr>
<td></td>
<td>Uniformity</td>
</tr>
<tr>
<td></td>
<td>Health</td>
</tr>
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<td></td>
<td>Condition</td>
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<td></td>
<td>Age and longevity</td>
</tr>
<tr>
<td></td>
<td>Reproductive ability</td>
</tr>
<tr>
<td></td>
<td>Milking ability</td>
</tr>
</tbody>
</table>

| Parts             | |
|                   | Back |
|                   | Barrel |
|                   | Feet and legs |
|                   | Rump |

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. List and discuss crosses, and their origination.</td>
<td>A. Oral or written test on recognition of breeds.</td>
</tr>
<tr>
<td>C. Test</td>
<td></td>
<td></td>
</tr>
<tr>
<td>. Animal science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>. Beef cattle husbandry</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Chart - Ref. Parts of a Beef Animal</th>
<th>A. Note taking</th>
<th>A. Written test</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Lecture</td>
<td>B. Label the parts in their proper places on the drawing of a cow.</td>
<td>. Given the name of the parts of a cow the student will locate at least 25 on a drawing of the animal.</td>
</tr>
<tr>
<td>C. Using judging scorecard, naming and pointing out the parts. Use a slide showing cow with parts labeled.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Lecture</th>
<th>A. Note taking</th>
<th>A. Test - Oral or Written</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Student discussion</td>
<td>B. Listing</td>
<td>. Name ten factors to be considered when selecting foundation or replacement of stock.</td>
</tr>
<tr>
<td>C. The judging manual</td>
<td>C. Factors to consider in selection.</td>
<td></td>
</tr>
</tbody>
</table>

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### Objectives by Unit

<table>
<thead>
<tr>
<th>Objective 6</th>
<th>Judge with at least 50% accuracy three classes of beef cattle.</th>
</tr>
</thead>
</table>
| CONTENT     | A. Categories of beef judging  
|             | 1. Confirmation  
|             | 2. Natural fleshing  
|             | 3. Breed and sex characteristics  
|             | 4. Constitution  
|             | 5. Feet, legs and bones  
| B. Judging techniques  
|             | 1. Consistency  
|             | 2. Classifications  
|             | 3. General appearance  
|             | 4. Beef characteristics  |

<table>
<thead>
<tr>
<th>Unit 2 - Beef Health</th>
<th>Objective 7</th>
<th>List and record causes, symptoms and controls of at least 20 diseases found in beef cattle.</th>
</tr>
</thead>
</table>
| CONTENT              | A. Diseases to be considered  
|                      | 1. Scours  
|                      | 2. Pneumonia  
|                      | 3. Ringworm  
|                      | 4. Mange  
|                      | 5. Lice  
|                      | 6. Grubs  
|                      | 7. Tuberculosis  
|                      | 8. Freemartin  
|                      | 9. Internal parasites  
|                      | 10. White muscle disease  
|                      | 11. Dysentary  
|                      | 12. Pink Eye  
|                      | 13. Warts  
|                      | 14. Influenza  
|                      | 15. Hemoragis Septicemia  
|                      | 16. Leptospirosis  
|                      | 17. Navel infection  
|                      | 18. IBR  
|                      | 19. Deficiencies  
|                      | 20. Virbiosis  |

<table>
<thead>
<tr>
<th>Objective 8</th>
<th>Outline a health program to follow for beef cattle.</th>
</tr>
</thead>
</table>
| CONTENT     | A. Application of knowledge studied  
|             | 1. Immunizations  
|             | 2. Antibiotics  
|             | 3. Disease prevention methods  
|             | 4. Coordinated for daily use  |

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### Teaching Methods

<table>
<thead>
<tr>
<th>A. Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Slides on yield grades</td>
</tr>
<tr>
<td>C. Lecture (short)</td>
</tr>
<tr>
<td>D. Slides of beef judging</td>
</tr>
<tr>
<td>E. Demonstration of judging</td>
</tr>
<tr>
<td>F. Field trips for judging</td>
</tr>
</tbody>
</table>

### Student Application Activities

<table>
<thead>
<tr>
<th>A. Notes on reasons and evaluation of each category.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Note taking</td>
</tr>
<tr>
<td>C. Discussion</td>
</tr>
<tr>
<td>D. Practice judging</td>
</tr>
</tbody>
</table>

### Evaluation Procedures

<table>
<thead>
<tr>
<th>A. Oral or written test</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Name the categories used in judging beef.</td>
</tr>
<tr>
<td>C. Evaluation to more than 50% accuracy demonstrated in judging of three classes of beef.</td>
</tr>
</tbody>
</table>

### A. Supervised study - assign each student to prepare oral report on cause symptoms and control of three diseases.

- References:
  - Beef cattle
  - Animal Health and Disease Control
  - Cattleman's Handbook
  - Ag. Ed. Bull. 1011

<table>
<thead>
<tr>
<th>A. Prepare oral reports on assigned diseases.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Class discussion.</td>
</tr>
</tbody>
</table>

### A. Instructor evaluation of disease record.

<table>
<thead>
<tr>
<th>A. Use of information previously acquired to outline a health program to be followed in raising Dairy Beef Calves.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Instructor's evaluation of health program.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Unit 3 - Feeding, growing and fitting beef</th>
<th><strong>CONTENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 9</td>
<td>Birth to six months</td>
</tr>
<tr>
<td>Organize a program to follow for feeding beef from birth to six months of age.</td>
<td>A. Range with Brood cow</td>
</tr>
<tr>
<td></td>
<td>. Feeding schedules for beef calves</td>
</tr>
<tr>
<td></td>
<td>. calf's digestive tracts</td>
</tr>
<tr>
<td></td>
<td>. liberal milk feeding</td>
</tr>
<tr>
<td></td>
<td>. using milk replacer</td>
</tr>
<tr>
<td></td>
<td>. limited milk feeding plus a dry calf starter</td>
</tr>
<tr>
<td></td>
<td>. nurse cow method</td>
</tr>
<tr>
<td></td>
<td>. skim milk method</td>
</tr>
<tr>
<td></td>
<td>. Water</td>
</tr>
<tr>
<td></td>
<td>. Hay</td>
</tr>
<tr>
<td></td>
<td>. Antibiotics</td>
</tr>
<tr>
<td></td>
<td>. Silage</td>
</tr>
<tr>
<td></td>
<td>. Pasture</td>
</tr>
<tr>
<td></td>
<td>. Minerals</td>
</tr>
<tr>
<td></td>
<td>. Vitamins</td>
</tr>
</tbody>
</table>

<p>| Objective 10                            | A. Six months to maturity |
| Organize a program to follow for feeding beef breeding stock from six months of age to maturity. | . Pasture |
|                                           | . Roughage |
|                                           | . Concentrates |
|                                           | . Water |
|                                           | . Vitamins |
|                                           | . Minerals |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Procure information concerning feeding programs for calves.</td>
<td>A. Instructor evaluation of Feeding Program.</td>
</tr>
<tr>
<td>B. Film strip on raising Beef calves</td>
<td>B. Panel discussion - Feeding whole milk vs. milk replaces.</td>
<td></td>
</tr>
<tr>
<td>C. Panel discussion</td>
<td>C. Outline the feeding program.</td>
<td></td>
</tr>
<tr>
<td>References -</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feeds and Feeding Abridged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raising Diary Calves and Heifers (Bulletin)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agway Tenderlean beef program</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beacon Tenderlean Program 3rd Edition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Movie - Calf Rearing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervised study -</td>
<td>A. Procure information concerning feeding programs for calves.</td>
<td>A. Instructor evaluation of Feeding Program.</td>
</tr>
<tr>
<td>Ref -</td>
<td>B. Outline the feeding program.</td>
<td></td>
</tr>
<tr>
<td>Feeds and Feeding abridged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raising dairy calves and heifers (bulletin)</td>
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</tr>
<tr>
<td>B. Field trip to a beef cattle raising operation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective 11</td>
<td>Content</td>
<td></td>
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<tr>
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</tr>
</tbody>
</table>
| Organize a program to follow for feeding beef from six months of age to finish. | Six months to finish
| A. Conventional Beef | A. Fitting |
| Pasture | Calves creep feeding |
| Without pasture | Cattle Feed rations |
| Concentrates, | Overconditioning |
| Water | Underconditioning |
| Vitamins and minerals | |
| B. Dairy Beef | B. Showing |
| Tenderlean Program | Clipping |
| beacon | Separation |
| agway | Form |
| wayne | Cleanliness |
| | Showmanship |

<table>
<thead>
<tr>
<th>Objective 12</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrate the ability to fit a beef animal for show.</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 4 - Housing requirements and equipment</th>
<th>Building Requirements</th>
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</thead>
<tbody>
<tr>
<td>Objective 13</td>
<td>A. Special Needs</td>
</tr>
<tr>
<td>Diagram a housing arrangement for a given number of cattle, including a breakdown of total cost of construction, and show the method of calculating the capacity.</td>
<td>5 sq. ft./100 lbs. of weight</td>
</tr>
<tr>
<td></td>
<td>B. Shelter</td>
</tr>
<tr>
<td></td>
<td>Draft free, Warm 40° - 50°, dry</td>
</tr>
<tr>
<td></td>
<td>C. Accessibility for cleaning</td>
</tr>
<tr>
<td></td>
<td>Not extremely important for calf pens</td>
</tr>
<tr>
<td></td>
<td>Easily disinfected every 6 weeks</td>
</tr>
<tr>
<td></td>
<td>D. Temperature regulation</td>
</tr>
<tr>
<td></td>
<td>Electricity - Heat lamps for winter</td>
</tr>
<tr>
<td></td>
<td>Exhaust fans</td>
</tr>
<tr>
<td></td>
<td>E. Handling facilities</td>
</tr>
<tr>
<td></td>
<td>Chute for restricting</td>
</tr>
<tr>
<td></td>
<td>dehorning</td>
</tr>
<tr>
<td></td>
<td>medicinal purposes</td>
</tr>
<tr>
<td></td>
<td>F. Cost of - Housing</td>
</tr>
<tr>
<td></td>
<td>Property</td>
</tr>
<tr>
<td></td>
<td>Excavation</td>
</tr>
<tr>
<td></td>
<td>Materials</td>
</tr>
<tr>
<td></td>
<td>Handling</td>
</tr>
<tr>
<td></td>
<td>Labor of construction</td>
</tr>
<tr>
<td></td>
<td>Personal labor</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Supervised study - References - . Building a Champion . 100 best fitting formulas (A.G. Bull. 1011)</td>
<td>A. Note taking of rules to follow in fitting. B. Discussion C. Practice showing</td>
</tr>
<tr>
<td>B. Guest speaker</td>
<td></td>
</tr>
<tr>
<td>C. Demonstration</td>
<td></td>
</tr>
<tr>
<td>D. Field trip</td>
<td></td>
</tr>
<tr>
<td>E. Supervised practice</td>
<td></td>
</tr>
<tr>
<td>A. Supervised study - References - . Beacon - Tenderlean Bull. (2nd Edition) . Animal Science . Animal Health and Disease Control . Livestock Magazines</td>
<td>A. Break class into groups to: . Research and record the needs of housing tenderlean calves. . Research and record the needs of housing for dairy or other beef calves B. Discussion C. Draw diagram of 3 sided pole shed for a given situation. D. Note taking E. Use the phone or visit material suppliers, seeking material and handling cost information. F. Contact contractors seeking labor cost.</td>
</tr>
<tr>
<td>B. Field trip to farm raising calves. . Beef cattle Husbandry</td>
<td></td>
</tr>
<tr>
<td>C. Field trip to farm maintaining older cattle</td>
<td></td>
</tr>
<tr>
<td>D. Lecture</td>
<td></td>
</tr>
<tr>
<td>E. Discussion</td>
<td></td>
</tr>
<tr>
<td>F. Use of phone to search material costs</td>
<td></td>
</tr>
</tbody>
</table>
### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective 14</th>
<th>Select the type of feeding and watering system to be used for raising beef, and list five reasons why this one was selected.</th>
</tr>
</thead>
</table>
| Considerations | A. Home built  
- Cost  
- Time  
- Ones own ability  
- Availability of materials  
B. Purchased  
- Quality  
- Cost  
- Availability  
C. Equipment Needed  
- Feed bunk  
- Self feeder  
- Winter proof watering  
- Mineral boxes  
- Hay rack  
- Scale  
- Restricting chute  
- Loading chute  |

<table>
<thead>
<tr>
<th>Objective 15</th>
<th>Name the feeding system to be used in finishing beef for market, and list two reasons for quality differences.</th>
</tr>
</thead>
</table>
| Cattle finish | A. Age goal  
- Conventional steers 15-24 months  
- Dairy beef - 12 months  
  - graze at 1 year of age and then -  
  - dry lot feed for 100 days  
  - gradual change from roughage - grain to full feed grain  
  - concentrate feed - 1000 lbs/head  
  - dairy beef - 12 months  
  - dry lot feed only -  
  - total concentrate - 3000 lbs/head  
B. Reasons for quality differences  
- Underfinishing  
  - animals which should have been culled  
  - insufficient feeding conditions  
  - lack of water  
- Over finishing  
  - overfeeding  
  - early finish lower quality  
- Economy  
  - total cost of raising animals  
  - cost per day of raising animals  
  - profit margin over feed cost  |
### TEACHING METHODS

<table>
<thead>
<tr>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
</tr>
<tr>
<td>B. Discussion group</td>
</tr>
<tr>
<td>C. Supervised study</td>
</tr>
<tr>
<td>D. Inquiry for information concerning costs of equipment</td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

<table>
<thead>
<tr>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Note taking</td>
</tr>
<tr>
<td>B. Prepare panel discussion with two groups of selected students - subject - Home built vs. Purchased</td>
</tr>
<tr>
<td>C. List personal preferences and five reasons why</td>
</tr>
</tbody>
</table>

### EVALUATION PROCEDURES

<table>
<thead>
<tr>
<th>Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Teacher evaluation of lists and reasons</td>
</tr>
</tbody>
</table>

### A. Supervised study

- References:
  - Agric. Ext. Bull. 1011

### B. Guest speaker panel

- Butcher
- Feeder
- Livestock marketer

<table>
<thead>
<tr>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Each student choose one method of finishing cattle and defend it by listing and rally reporting only on its desirable points class discussion</td>
</tr>
<tr>
<td>B. Record notes on panel, discuss and question speakers</td>
</tr>
<tr>
<td>C. Select students to plot a growth curve for - Underfinished animals vs. Economy Overfinished animals vs. Economy</td>
</tr>
</tbody>
</table>

### A. Teacher evaluation of oral report

- Oral or written test on reasons for quality differences
Objective 16
Locate five facilities available for marketing the finished product.

<table>
<thead>
<tr>
<th>Facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Friends and relatives</td>
</tr>
<tr>
<td>B. Local slaughter and retail facilities</td>
</tr>
<tr>
<td>C. Chain store</td>
</tr>
<tr>
<td>D. Livestock markets</td>
</tr>
<tr>
<td>E. Dealers</td>
</tr>
<tr>
<td>F. Return prices - supply and demand</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>A. Problem solving discussion of live supervised research.</td>
</tr>
<tr>
<td>B. Let each student locate two available facilities, and report.</td>
</tr>
</tbody>
</table>

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17
Title - BEEF PRODUCTION  
Code - 01.01010102-01

RESOURCE MATERIALS

Books:  
Cattleman's Handbook by Springer Interstate
Sanitation and Disease Control by Dykstra Interstate
Animal Science by Ensminger - Interstate
Beef Cattle Husbandry, Ensminger, Interstate

Bulletins:  
100 Best Fitting Formulas for Blue Ribbon Beef,  
Albers Milling Co. 1061 Central St., Kansas City, Mo.
4-H Bulletins - Calf Raising. Agric. Ed.
Agway
Purina - Building Champions
Wayne
Beacon
Other Food Companies
I.M.S. Stone Hall, Cornell University, Ithaca, New York
Ag. Ext. Bulletin 1011 - Raising Beef Cattle in N.Y.S.

Periodicals:  
Farm Journal Magazine
Successful Farming Magazine
Breed Association Magazines or Journals
Feed Company News
American Agriculturist
American Stockman

Audiovisuals:  
Movie Calf Rearing - Purina Feeds, Ralston Purina Co.
Checkerboard Square, St. Louis, Mo.
Wayne Feeds

Parts of a Beef Animal - Chart from Wrlkayr Ed. Service,
126 Park Drive, Williamsville 21, New York
PARTS OF A BEEF ANIMAL

- Arm
- Back
- Brisket
- Crest
- Crops
- Dew Claw
- Elbow
- Face
- Forehead
- Fore Flank
- Fore Ribs
- Hind Flank
- Shoulder
- Tail Head
- Twist
- Hip (Hook)
- Hock
- Loin
- Muzzle
- Neck
- Poll
- Point of Shoulder
- Ribs
- Round
- Rump
- Shanks
- Withers

KEY

1. Muzzle
2. Face
3. Forehead
4. Poll
5. Crest
6. Shoulder
7. Withers
8. Crops
9. Back
10. Loin
11. Hip (Hook)
12. Rump
13. Tail Head
14. Round
15. Twist
16. Hock
17. Shanks
18. Dew Claw
19. Hind Flank
20. Ribs
21. Fore Ribs
22. Fore Flank
23. Arm
24. Elbow
25. Brisket
26. Point of Shoulder
27. Neck

SUGGESTIONS TO GROUP LEADERS:

1. Give each member one copy of this lesson and let him study the picture and list of parts for 15 minutes.
2. Make a game of it; divide club into 2 teams, have each fold the page at the dotted line; have “name down” by asking members of each side, alternately, to name a part as you call the number.
3. At second meeting, have members study picture again, then have them fold on dotted line and write correct number on blank in front of names of parts listed.
4. Visit a beef farm and have members point out the parts on a real animal.

WALKAYR-EDUCATIONAL SERVICE
126 Park Drive
Williamsville 21, N. Y.
MODULE OF INSTRUCTION

Title - HANDLING THE FOAL

Code - 01.01010103-01

DESCRIPTION:

The student will practice the proper and safe procedure of approaching and catching a foal in a box stall and in an enclosed lot. The art of leading a foal as well as trimming its feet will be demonstrated and practiced. The articles of good grooming and the equipment necessary to accomplish this task will be practiced. Many techniques will be discussed in constraining of a foal and at least five different skills will be practiced in administering of medications.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocations</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Catching and leading</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2. Constraining methods</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3. Trimming hooves</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>4. Grooming the foal</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5. Administering medications</td>
<td>2.5</td>
<td>4.25</td>
</tr>
</tbody>
</table>

Revised June, 1974
OBJECTIVES to be obtained:

The student will be able to:

1. Approach and catch a foal in a stall and in a fenced lot.

2. Demonstrate the proper procedure for leading and tying a foal using a halter, lead line and a cross tie.

3. List three methods of restraining a foal and demonstrate at least one of them.

4. Safely pick up the front and back hooves of a foal (while it is tied in a cross tie) and demonstrate a method of caring for a foal's hooves.

5. Demonstrate the proper methods of grooming a foal.

6. Demonstrate how to clip the head and legs of a foal, using electric clippers.

7. Demonstrate the proper procedure of constraining a foal.

8. Enter a foal's stall without the foal escaping.

9. Use instruments such as a syringe, tube and hypodermic needle, to administer medication to a foal in at least five different ways.
<table>
<thead>
<tr>
<th>Unit 1 - Catching and leading</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #1</td>
<td>A. Haltering</td>
</tr>
<tr>
<td>Approach and catch a foal in</td>
<td>B. Roping - 30 feet</td>
</tr>
<tr>
<td>a stall and in a fenced lot.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objective #2</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrate the proper</td>
<td>A. Lead line use</td>
</tr>
<tr>
<td>procedure for leading and</td>
<td>B. Cross tying</td>
</tr>
<tr>
<td>tying a foal using a halter,</td>
<td></td>
</tr>
<tr>
<td>lead line and a cross tie.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 2 - Constraining methods</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #3</td>
<td>Use of:</td>
</tr>
<tr>
<td>List three methods of</td>
<td>A. Twitch</td>
</tr>
<tr>
<td>restraining a foal and</td>
<td>B. Ropes</td>
</tr>
<tr>
<td>demonstrate at least one of</td>
<td>C. Straps</td>
</tr>
<tr>
<td>them.</td>
<td>D. Hobbles</td>
</tr>
<tr>
<td></td>
<td>E. Other</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Discuss and list on board precautionary measures needed for student safety.</td>
<td>A. Enter stall using all precautionary measures to safeguard the student - put halter on foal.</td>
<td>A. Teacher assessment of demonstrated procedures.</td>
</tr>
<tr>
<td>B. Demonstrate how to make a temporary stall with a 30 ft rope in a corner of a field.</td>
<td>B. Turn foal out into a fenced lot. Using a rope approx. 30 ft. long, make a temporary stall with the rope to capture the foal.</td>
<td></td>
</tr>
<tr>
<td>C. Demonstrate to student procedure of putting a rope on a foal. Cpt 3 page 115.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Supervised practice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Demonstrate the use of a lead line.</td>
<td>A. Connect a lead line to foal's halter. Attach a long rope around behind the foal and teach the foal to lead. All leadsmen must have an assistant to help prevent injury to the foal.</td>
<td></td>
</tr>
<tr>
<td>B. Lecture and list on board the dangers of a cross tie, Cpt 3, pg 115*</td>
<td>B. Lead foal to an alley in the barn. Fasten foal to cross ties. Student and assistant must remain with foal to prevent any injury to the foal.</td>
<td></td>
</tr>
<tr>
<td>C. Discussion and list on board the advantages of using a cross tie.</td>
<td></td>
<td>A. Teacher assessment of demonstrated procedures.</td>
</tr>
<tr>
<td>D. Demonstrate leading.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Supervised practice.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Illustrate procedure of keeping foal on opposite side of the stall when attendant enters the stall.</td>
<td>A. Students demonstrate how to keep a foal away from the front end of a stall when the student enters the stall.</td>
<td></td>
</tr>
<tr>
<td>B. Demonstrate how to apply a twitch on a foal's nose and ears.</td>
<td>B. Students must apply a twitch on a foal's nose and ear (gently).</td>
<td>A. Oral or written quiz.</td>
</tr>
<tr>
<td>C. Tie up one front leg</td>
<td>C. Demonstrate the procedure used in &quot;casting&quot; a foal in a stall.</td>
<td>B. Teacher assessment of each student demonstration.</td>
</tr>
<tr>
<td>D. Throw a foal with the aid of ropes.</td>
<td>D. Using a strap, tie up one front foot of a foal.</td>
<td></td>
</tr>
<tr>
<td>E. Use a large flat instrument such as a broom to force a foal to go to opposite side of stall when an attendant enters the stall.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Care and Training of Horses and Pacers
| Unit 3 - Trimming hooves | Use:  
| Objective #4 | A. Hoof pick  
| Safely pick up the front and back hooves of a foal (while it is tied in a cross tie) and demonstrate a method of caring for a foal's hooves. | B. Rasp  
| | C. Hoof knife |  

| Unit 4 - Grooming the foal | Use:  
| Objective #5 | A. Curry comb  
| Demonstrate the proper methods of grooming a foal. | B. Body brush  
| | C. Cloth  
| | D. Comb |  

| Unit 4 | Use:  
| Objective #6 | A. Clippers  
| Demonstrate how to clip the head and legs of a foal, using electric clippers. |  

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Demonstration - proper methods of picking up a foal's feet off the ground. B. Discuss and illustrate on board or overhead the proper angle of front and hind hooves. C. Demonstrate the proper use of a hoof knife, hoof pick and rasp. D. Supervised practice.</td>
<td>A. Each student will pick up all four feet of a foal using all safety precautions discussed in class. B. Each student will demonstrate the proper use of a hoof pick, hoof knife and rasp.</td>
<td>A. Teacher assessment of students demonstration.</td>
</tr>
<tr>
<td>A. Demonstrate proper use of the curry comb, body brush, mane and tail comb and soft cloth as a wiping cloth. B. Supervised practice.</td>
<td>A. Place foal in a cross tie - thoroughly cleaning the coat of the animal using curry comb, body brush, mane comb and soft cloth. B. If necessary, prevent foal from tossing its head and proceed to clip the halter path and muzzle of the foal using a set of electric clippers.</td>
<td>A. Teacher assessment of student demonstration.</td>
</tr>
<tr>
<td>A. Review methods of constraining a foal. B. Illustrate on a board or overhead areas to be clipped i.e. halter path at poll, hairs around muzzle and hairs behind the fetlock joint. C. Demonstrate on the correct angle and type of clippers to be used. D. Supervised practice.</td>
<td>A. Place foal in a cross tie - thoroughly cleaning the coat of the animal using curry comb, body brush, mane comb and soft cloth. B. If necessary, prevent foal from tossing its head and proceed to clip the halter path and muzzle of the foal using a set of electric clippers.</td>
<td>A. Teacher assessment of student. Oral Test Demonstration</td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>----------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Unit 5 - Administering medication</td>
<td>Review:</td>
<td></td>
</tr>
<tr>
<td>Objective #7</td>
<td>A. Leadline use</td>
<td></td>
</tr>
<tr>
<td>Demonstrate the proper procedure of constraining a foal.</td>
<td>B. Cross tying</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Twitch</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Ropes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Straps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F. Hobbles</td>
<td></td>
</tr>
<tr>
<td>Objective #8</td>
<td>A. Calmness</td>
<td></td>
</tr>
<tr>
<td>Enter a foal's stall without the foal escaping.</td>
<td>B. Authority</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Gentleness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Relaxation</td>
<td></td>
</tr>
<tr>
<td>Objective #9</td>
<td>Use of:</td>
<td></td>
</tr>
<tr>
<td>Use instruments such as a syringe, tube and hypodermic</td>
<td>A. Drench bottle</td>
<td></td>
</tr>
<tr>
<td>needle, to administer medication to a foal in at least</td>
<td>B. Rubber tube</td>
<td></td>
</tr>
<tr>
<td>five different ways.</td>
<td>C. Hypodermic needle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Feed</td>
<td></td>
</tr>
</tbody>
</table>
### Teaching Methods
- A. Review by discussion and supervised practice, objective #2 and #3.

### Student Application Activities

#### A. Demonstrate how to keep a foal away from the front end of a stall when the student enters the stall.
- B. Apply a twitch on a foal's nose and ear (gently).
- C. Demonstrate the procedure used in "casting" a foal in a stall.
- D. Using a strap, tie up one front foot of a foal.

#### A. Class discussion.
- B. Demonstration.
- C. Supervised practice.

#### A. Practice approach of foal.

### Evaluation Procedures

- A. Teacher assessment of student procedure.

#### A. Give a foal or a horse 5 cc of water using a syringe.
- B. Squeeze the horse's nasal passages to force the horse to swallow.
- C. Demonstrate on a model the use of a hypodermic needle.
- D. Illustrate on a poster and then a model how to insert a rubber tube into a horse's stomach.
- E. List methods of concealing medicine in feed.

- A. Teacher assessment of student procedure of:
  - Administering medication
  - Using no fewer than 5 methods.
MODULE OF INSTRUCTION

Title - HANDLING THE FOAL

Code - 01.01010103-01

RESOURCE MATERIALS

BOOKS -

Horse Science Handbook - 1964

Horse Science Handbook - Volume 3
by M.E. Ensminger - Pub - Agri-services Foundation, 3699 E. Sierra Ave.
Clovis, California

Care and Training of the Trotter and Pacer
by James C. Harrison
Pub. The United States Trotting Association
750 Michigan Avenue
Columbus, Ohio 43215

Horses and Horsemanship
by M. E. Ensminger
The Interstate Printers and Pub. Inc.
Danville, Illinois
The student will study the types of harnesses, their functions and uses. The student will start with the basic ground training necessary for the preparation of hitching the horse to the training vehicle. The student will actually hitch, drive, and perform the horse at different speeds and gaits. Arrangements will be made with the local race track for the students to observe the way of going so that irregularities or movement defects can be detected.
OBJECTIVES to be obtained:

The student will be able to:

1. Identify all parts and functions of a bitting harness.
2. Put a bitting harness on a horse and make all proper adjustments.
3. Use a lunge line and a training whip to lunge a horse at the walk and trot in both directions.
4. Use long lines to drive a horse while walking behind the horse.
5. Identify all the parts and functions of a driving harness.
6. Adjust and properly fit a harness to a horse.
7. Hitch the harnessed horse to an appropriate two wheeled training vehicle.
8. Use the reins to guide the horse, and drive over a prescribed course.
9. Make the horse perform at his gaits at different speeds, while using training equipment.
10. Recognize through observations of the horse's leg movements, defects in the "way of going" of the horse.
### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 1 - Bitting Harness</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #1</td>
<td>A. The Harness</td>
</tr>
<tr>
<td>Identify all parts and functions of a bitting harness.</td>
<td>. Surcingle . Crupper . Lunge Bridle . Open Bridle</td>
</tr>
<tr>
<td>Objective #2</td>
<td>A. Open bridle B. Lunge bridle</td>
</tr>
<tr>
<td>Put a bitting harness on a horse and make all proper adjustments.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 2 - Lunge Line and Long Line</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #3</td>
<td>A. Lunge Line - Ch. 16 Pg 674 H&amp;H B. Training Whip</td>
</tr>
</tbody>
</table>
| Use a lunge line and a training whip to lunge a horse at the walk and trot in both directions. | *NOTE - There is some contradiction to the usefulness of lunging a horse.  
- Some horses should not be lunged, as sharp turns can cause further damage to those with bad stifles. |
| Objective #4  | A. Long lines B. Training whip |
| Use long lines to drive a horse while walking behind the horse. |
### TEACHING METHODS

| A. Use wall charts on harnesses to identify parts. |
| B. Assembly demonstration by teacher on a bitting harness - Ch. 3, Pg 116-121* |
| C. Class discussion - list of advantages and disadvantages of a lunge bridle versus an open bridle made by instructor. |
| D. Supervised study * (see B. above) |

**Care and Training of Trotters and Pacers**

| A. Supervised practice |

### STUDENT APPLICATION ACTIVITIES

| A. Take notes |
| B. Assemble - a complete harness |
| C. Put harness on a horse |
| D. Make all necessary adjustments for proper fitting. |
| E. Note advantages and disadvantages of a lunge bridle. |
| F. Fit lunge and open bridle on horse. |
| G. Make adjustments for proper fitting. |

### EVALUATION PROCEDURES

| A. Teachers' evaluation of students notes. |
| B. Teachers' evaluation of students' ability to harness a horse and adjust. |

### A. Practice fitting bridles. |

### A. Teachers' evaluation of students' ability to fit a bridle. |

| A. Illustrate - the making of a lunge line from a length of rope. |
| B. Demonstrate - use of a training whip. |
| C. Supervised practice. |

### A. Note the illustrations and demonstrations |

| B. Attach lunge line to lunge bridle |
| C. Make different types of lunge lines. |
| D. Use a lunge line with an open bridle. |

### A: Teachers' evaluation of students' preparation of the different lunge lines. |

| B. Teachers' evaluation of students' ability to work the horse with lunge lines. |

| A. Prepare illustration of use of side lines on the bitting harness. (pp 122-126) |

**Care and Training of Trotters and Pacers**

| B. Supervised practice. |

### A. Note teacher's illustration. |

| B. Attach lunge lines |
| C. Work horse in long lines at the walk and trot in both directions with both types of bridle. |

### A. Teachers' evaluation of students' ability to attach lunge lines and work the horse. |
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 3 - Driving Harness and Hitching</td>
<td>A. Parts of harness</td>
</tr>
<tr>
<td>Objective #5 Identify all the parts and functions of a driving harness.</td>
<td>- Driving Harness</td>
</tr>
<tr>
<td></td>
<td>- Blind bridle shadow roll -</td>
</tr>
<tr>
<td></td>
<td>Page 46-461 - Ch. 8 **</td>
</tr>
<tr>
<td></td>
<td>- Bucking strap</td>
</tr>
<tr>
<td></td>
<td>- Hobbles</td>
</tr>
<tr>
<td></td>
<td>- Crupper</td>
</tr>
<tr>
<td></td>
<td>- Belly band</td>
</tr>
<tr>
<td></td>
<td>- Check lines</td>
</tr>
<tr>
<td>Objective #6 Adjust and properly fit a harness to a horse.</td>
<td>A. Use of whole harness</td>
</tr>
<tr>
<td></td>
<td>B. Approach to horse</td>
</tr>
<tr>
<td></td>
<td>C. Adjustments</td>
</tr>
<tr>
<td>Objective #7 Hitch the harnessed horse to an appropriate two wheeled training</td>
<td>A. Two wheeled driving cart -</td>
</tr>
<tr>
<td>vehicle.</td>
<td>Ch. 16 - pg. 640-641 *</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
</tbody>
</table>
| A. Class discussion of parts and functions of harness  
B. Use wall charts - of a harness Ch. 16 Pg. 642*  
C. Supervised study of harness or model. | A. Note taking  
B. Participate in class discussion.  
C. Keep drawings or photos of harness in notebook. | A. Oral or written quiz - identify all parts of harness. |
| A. Demonstrate - proper fit and adjustment of a blind bridle, saddle and belly band, crupper, traces, check lines and shadow roll. Ch. 3 Pg. 126-139**  
B. Explain - safety factors of using a bucking strap. Pg. 459 Ch. 8 **  
C. Illustrate - proper adjustments of hobbles. Ch. 8 Pg. 490-491**  
D. Supervised practice on a gentle animal. | A. Practice fitting harness to the horse as demonstrated.  
| A. Oral or written quiz - identify all parts of harness. | A. Teacher evaluation of students ability to approach and harness the horse. |
| A. Class discussion  
B. Demonstration of hitching the cart.  
C. Supervised practice. | A. Participate in discussion  
B. Practice hitching the horse to the cart. | A. Teacher evaluation of students ability to hitch the harnessed horse to the cart. |
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 4 - Driving the Horse</td>
<td>A. The harnessed horse only.</td>
</tr>
<tr>
<td>Objective # 8</td>
<td>B. Hitch to a two wheeled cart</td>
</tr>
<tr>
<td>Use the reins to guide the horse, and drive over a</td>
<td>NOTE: When breaking a young horse to the cart for the first time, the outside wraps on the girth should be wrapped through the shaft</td>
</tr>
<tr>
<td>prescribed course.</td>
<td>holders. If the horse should throw himself, he can be released simply by unhooking the tugs and pulling the cart back and away.</td>
</tr>
<tr>
<td></td>
<td>C. Review of safety procedures used when working with harnesses and harness horses.</td>
</tr>
<tr>
<td></td>
<td>D. Gentle pat on horse's neck is a good reward for the horse when he performs well.</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
</tbody>
</table>
| A. Class discussion  
  - Review safety procedures  
  - Review "Give and Take" theory of controlling a horse  
  - Review "Punishment and Reward" theory. Ch. 3  
  Pg 129-139**  
B. Illustrate proper mounting of a two wheeled vehicle.  
Ch. 12 Page 632-633**  
** Care and Training of Trotters and Pacers  
C. For breaking a young horse the teacher should reinforce the need for two assistants | A. Safety Procedures  
  - Assistant leads harnessed horse at the beginning  
  - Driver will walk behind cart until student feels confident the horse will remain steady and will respond to commands (before entering cart.)  
  - After the driver is in complete control the assistant will remove his lead line but must stay with his partner to give assistance whenever needed.  
  - "Give and take theory" - the driver will pull the left rein and slightly release the right rein to make the horse turn to the left. Reverse procedure to make opposite turn.  
  - "Punishment and Reward" theory -  
  - urge or persuade the horse to advance  
  - apply back pressure on reins - punishment - to bring the horse to a halt or standing position.  
  - release pressure on the horse's mouth Reward - when the horse stops. | A. Teachers' evaluation of students' ability to perform driving the horse over a specific area. |
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 5 - Gaits and Speeds/Objective #9</td>
<td></td>
</tr>
</tbody>
</table>
Make the horse perform at his gaits at different speeds, while using training equipment. |
| A. Hitch horse to two wheeled cart. |
| B. Drive |
| C. Jog |
| NOTE: Sor... have one gait, and it sh...ed. |
**TEACHING METHODS**

| A. Review safety procedures |
| B. Review "Give and take" theory of controlling a horse. |
| C. Review "Punishment and Reward" theory. Ch 3 Pp 129-139** |
| D. Review proper mounting of a two wheeled vehicle. |

**STUDENT APPLICATION ACTIVITIES**

| Drive the hitched animal to an enclosed area - either indoor or outdoors. |
| Jog the horse around the ring or track. |
| A. If the horse is a racing breed, jog the horse clockwise around the track. |
| If the horse is of a pleasure or show breed, jog along the rail in a counterclockwise direction. |
| B. Racing Breeds will be exercised in one direction to develop the animal's muscle structure and lung capacity. Control his animal to perform in a straight line. |
| C. For pacers hobbles are used. |
| D. The Pleasure and Show Breeds will be driven over a prescribed course (figure 8 both ways of the ring - along the rail as much as possible). |
| E. The Pleasure or Show Breeds will be urged to maintain a trotting gait. |
| F. Whenever necessary, use a whip to urge the horse to a greater speed. The horse will not be allowed to change his gait. The horse must only increase his speed at the present gait. |

**EVALUATION PROCEDURES**

<p>| A. Oral or written quiz - List the safety procedure to be used for the hitching of a horse to and driving with a two wheeled cart. |
| B. Orally or in writing, explain the &quot;Give and Take&quot; theory. |
| C. Teacher evaluation of the students driving ability. |</p>
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 6 - Way of Going</td>
<td></td>
</tr>
<tr>
<td>Objective #10</td>
<td>Recognize through observations of the horse's leg movements, defects in the &quot;Way of Going&quot; of the horse.</td>
</tr>
<tr>
<td></td>
<td>A. Forging</td>
</tr>
<tr>
<td></td>
<td>B. Interfering</td>
</tr>
<tr>
<td></td>
<td>C. Winging</td>
</tr>
<tr>
<td></td>
<td>D. Paddling</td>
</tr>
<tr>
<td></td>
<td>E. Cross-firing</td>
</tr>
<tr>
<td></td>
<td>F. Timing of hoof beats</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Class discussion of each item in content</td>
<td>A. Listen to the hoof beat for uneven beats.</td>
</tr>
<tr>
<td>B. Illustration by Wall Charts or Transparencies showing the different irregularities in the &quot;Way of Going&quot; of a harnessed horse. Ch. 6 in ** Care and Training Trotters and Pacers **</td>
<td>B. Observe the horse's &quot;way of going&quot; from the side to locate any irregularities.</td>
</tr>
<tr>
<td>C. Line demonstration</td>
<td>C. Change places with the assistant to see the horse's movement from both angles.</td>
</tr>
<tr>
<td>D. Supervised practice.</td>
<td></td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - HARNESS TRAINING OF HORSES

Resource Materials

Books - Care and Training of the Trotter and Pacer
by - James C. Harrison
Published by the United States Trotting Association
750 Michigan Avenue
Columbus, Ohio 45215

Horses and Horsemanship
by - E. M. Ensminger
Published by the Interstate Printers and Publishing, Inc.
Danville, Illinois 61832
MODULE OF INSTRUCTION

Title: CARE OF TACK AND EQUIPMENT
Code: 01.01010103-03

DESCRIPTION:

Tack and equipment condition is second only to the condition of the horse. Its importance, therefore, can not be over emphasized. In this module the student will be involved with the essential phases of tack and equipment conditioning. The student will demonstrate an ability to correctly clean and store tack and equipment. This process will involve the student in "learning by doing."

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>Cleaning supplies</td>
<td>2</td>
</tr>
<tr>
<td>Cleaning tack</td>
<td>0</td>
</tr>
<tr>
<td>Cleaning of equipment</td>
<td>0</td>
</tr>
<tr>
<td>Storage of tack and equipment</td>
<td>2</td>
</tr>
</tbody>
</table>

Revised August, 1975
MODULE OF INSTRUCTION

Title - CARE OF TACK AND EQUIPMENT

OBJECTIVES to be obtained:

The student will be able to:

1. Identify 11 pieces of tack and equipment.

2. Identify 14 articles needed for cleaning tack and equipment.

3. Demonstrate methods of removing dirt from pieces of tack by using specific cleaning agents that are offered by the instructor.

4. Identify and demonstrate use of preventives that will increase the use of tack and equipment.

## Objectives by Unit

<table>
<thead>
<tr>
<th>Unit 1 - Cleaning Supplies</th>
<th>Objective 1</th>
<th>Objective 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify 11 pieces of tack and equipment.</td>
<td>A. Articles</td>
<td>Identify 14 articles needed for cleaning tack and equipment.</td>
</tr>
</tbody>
</table>

### A. Articles
- Biting harness
- Driving harness
- Bridles
- Halter
- Saddles
- Girths
- Stirrups and straps
- Bits
- Training boots
- Hobbles
- Reins

### A. Equipment and material needed
- Harness rack or hook
- Bridle peg
- Saddle rack
- Sponges
- Chamomile cloth
- Cheesecloth
- Flannel rags
- Saddle soap
- Glycerine soap
- Neatsfoot oil
- Metal polish
- Petroleum jelly
- Pulls
- Towels
### Teaching Methods

- A. Lecture and class discussion introducing students to the articles which need cleaning.
  - Instructor will introduce the articles used in the cleaning, preserving and polishing of harnesses, saddles and training equipment.
  - The instructor will list the order of preference of use in the cleaning of leather goods, metal articles and training vehicles.
  - Demonstrate washing of leather articles.
  - Refer to page 643-648 of *Horses and Horsemanship*, by Ensminger.

### Student Application Activities

- A. List each article of tack used which needs care.
  - Note the characteristics of each for further identity.

### Evaluation Procedures

- A. Written or oral test to identify each of 10 articles of tack or equipment which may need to be cleaned.

- A. List each material and substance for cleaning tack. Note the smells and textures of these new materials.

- B. List a use for each material.

- C. Disassemble and wash all leather articles.

- A. Written or oral test identifying each of 12 materials and a use of each.
# Objectives by Unit

## Unit 2 - Cleaning Tack

Objective 3

Demonstrate methods of removing dirt from pieces of tack by using specific cleaning agents that are offered by the instructor.

### A. Equipment to be washed

- Harnesses
- Training cart
- Pleasure driving cart
- Sulkys
- Fine harness buggy
- Viceroy

## Unit 3 - Cleaning of Equipment

Objective 4

Identify and demonstrate use of preservatives which will increase the use of tack and equipment.

### A. Equipment to be cleaned

- Training cart
- Pleasure driving cart
- Sulkys
- Fine harness buggy
- Viceroy
- Harnesses
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
</table>
| A. Demonstrate technique of washing | A. List the equipment which will need washing  
B. Practice washing each piece of equipment as instructed | A. Teacher evaluation of list  
B. Teacher evaluation of student progress in producing a piece of tack or equipment which is free from sweat and grime that has evidence of a preservative added to it. |

A. Instructor will introduce and demonstrate each article used in the cleaning, preserving and polishing of harnesses, saddles and training equipment.  
B. Supervised practice  
C. The instructor will list the order of preference of use in the cleaning of leather goods, metal articles and training vehicles. Refer to page 643-648 of, Horses and Horsemanship, by Ensminger.  

A. Compile a list of the preferred order of equipment to be cleaned and preserved, noting how often.  
B. Practice applying preservatives as instructed.  

A. Teacher evaluation of list  
B. Teacher evaluation of students completed job of cleaning and preserving an assigned article.
<table>
<thead>
<tr>
<th>Unit 4 - Storage of tack and equipment</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 5</td>
<td></td>
</tr>
</tbody>
</table>
| Contrast correct with incorrect methods of storing equipment and tack. List methods of correctly storing five pieces of tack. | A. Tack room  
  . Size  
  . Ventilation  
  . Neatness  
  B. Hanging racks  
  . Size  
  . Placing  
  . Use  
  C. Shelter for driving  
  . Vehicles |

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8
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and supervised study from pp 648 of, Horse and Horsemanship</td>
<td>A. Note taking</td>
<td>A. Oral or written test. List 7 incorrect methods of storing 7 different pieces of tack or equipment.</td>
</tr>
<tr>
<td>B. Demonstrate correct methods of storing each piece of tack and equipment</td>
<td>B. Copy list of methods for storage of tack and equipment from, Horse and Horsemanship.</td>
<td>B. Teacher evaluation of student work with equipment storage.</td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice organizing tack and equipment</td>
<td></td>
</tr>
<tr>
<td>D. Class discussion of need for and shelter for vehicles</td>
<td>D. Following the cleaning, preserving, polishing and greasing of all tack and equipment the students will store each article in its appropriate storage in the tack room or storage shed.</td>
<td></td>
</tr>
</tbody>
</table>

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RESOURCE MATERIALS

A. Books - Horses and Horsemanship
   Dr. M.E. Ensminger
   Fourth Edition
   The Interstate Printers and Publishers Inc.
   Danville, Illinois

B. Bulletins -
MODULE OF INSTRUCTION

Title - CARE OF FEET AND LEGS

Code - 01.01010103-04

DESCRIPTION:

The student will spend much of the time analyzing the most important part of the horse's anatomy - his legs. The student will view horses in order to gain experience in determining what causes horses to become lame and to interfere with its own movements. The predisposition of the common unsoundnesses and what can be done to correct these conditions will be studied.

The wrapping of legs with bandages will be stressed as well as aid to healthy hoof growth.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Anatomy and nomenclature of the hoof</td>
<td>2</td>
</tr>
<tr>
<td>2. Abnormal Posture</td>
<td></td>
</tr>
<tr>
<td>3. Hoof Trimming</td>
<td>2</td>
</tr>
<tr>
<td>4. Lameness and unsoundness</td>
<td>2</td>
</tr>
<tr>
<td>5. Wrapping Legs</td>
<td>6</td>
</tr>
</tbody>
</table>

Revised June, 1974
MODULE OF INSTRUCTION
Title - CARE OF FEET AND LEGS

OBJECTIVES to be obtained:

The student will be able to:

1. List the major bones and muscles of the front feet and legs of a horse.
2. List the major bones and muscles of the hind feet and legs of a horse.
3. Name the parts of the foot as viewed from the side and bottom while using an illustration or chart.
4. List abnormal standing positions of a horse's front and hind legs.
5. Recognize the different "ways of going" that need to be corrected by means of corrective shoeing.
6. Demonstrate the proper techniques of trimming a horse's hoof.
7. List the causes of lameness and unsoundnesses of horses' legs and hooves.
8. Illustrate hoof abnormalities.
9. Demonstrate the proper procedure for wrapping a horse's leg.
10. Demonstrate the proper method of applying hoof conditioners when given commercial conditioners and materials needed.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Anatomy and nomenclature of the hoof</strong></td>
<td><strong>A. Bones</strong></td>
</tr>
<tr>
<td>Objective #1</td>
<td>List the major bones and muscles of the front feet and legs of a horse.</td>
</tr>
<tr>
<td></td>
<td>Scapula</td>
</tr>
<tr>
<td></td>
<td>Humerus</td>
</tr>
<tr>
<td></td>
<td>Elbow</td>
</tr>
<tr>
<td></td>
<td>Ulna</td>
</tr>
<tr>
<td></td>
<td>Radius</td>
</tr>
<tr>
<td></td>
<td>Pisiform</td>
</tr>
<tr>
<td></td>
<td>Two rows of carpal (knee) bones</td>
</tr>
<tr>
<td></td>
<td>Splint bones</td>
</tr>
<tr>
<td></td>
<td>Cannon</td>
</tr>
<tr>
<td></td>
<td>Sesamoids</td>
</tr>
<tr>
<td></td>
<td>First phalanx (long pastern)</td>
</tr>
<tr>
<td></td>
<td>Second phalanx (short pastern)</td>
</tr>
<tr>
<td></td>
<td>Pedal or coffin bone</td>
</tr>
<tr>
<td></td>
<td><strong>B. Muscles</strong></td>
</tr>
<tr>
<td></td>
<td>Deltoid</td>
</tr>
<tr>
<td></td>
<td>Caput magnum</td>
</tr>
<tr>
<td></td>
<td>Caput medium</td>
</tr>
<tr>
<td></td>
<td>Anterior pectoral</td>
</tr>
<tr>
<td></td>
<td>Extensor metacarpi magnus</td>
</tr>
<tr>
<td></td>
<td>Extensor pedis</td>
</tr>
<tr>
<td></td>
<td>Extensor sufraginis</td>
</tr>
<tr>
<td></td>
<td>Tendon extensor (metacarpi magnus)</td>
</tr>
<tr>
<td></td>
<td>Tendon extensor pedis</td>
</tr>
<tr>
<td></td>
<td>Flexor metacarpi</td>
</tr>
<tr>
<td></td>
<td>Ligament</td>
</tr>
<tr>
<td><strong>Objective #2</strong></td>
<td>List the major bones and muscles of the hind feet and legs of a horse.</td>
</tr>
<tr>
<td></td>
<td><strong>A. Bones</strong></td>
</tr>
<tr>
<td></td>
<td>Pelvis</td>
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<tr>
<td></td>
<td>Femur</td>
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<td></td>
<td>Patella</td>
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<td></td>
<td>Fibula</td>
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<tr>
<td></td>
<td>Tibia</td>
</tr>
<tr>
<td></td>
<td>Point of hock</td>
</tr>
<tr>
<td></td>
<td>Tarsals</td>
</tr>
<tr>
<td></td>
<td>Splint bones</td>
</tr>
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<td></td>
<td>Cannon</td>
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<tr>
<td></td>
<td>Sesamoids</td>
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<td></td>
<td>First phalanx (long pastern)</td>
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<tr>
<td></td>
<td>Second phalanx (short pastern)</td>
</tr>
<tr>
<td></td>
<td>Pedal or Coffin bone</td>
</tr>
<tr>
<td></td>
<td><strong>B. Muscles</strong></td>
</tr>
<tr>
<td></td>
<td>Gluteus superficialis</td>
</tr>
<tr>
<td></td>
<td>Semitendinosus</td>
</tr>
<tr>
<td></td>
<td>Long vastus</td>
</tr>
<tr>
<td></td>
<td>Tensor fasciae 1</td>
</tr>
<tr>
<td></td>
<td>Tensor fasciae 2</td>
</tr>
<tr>
<td></td>
<td>Gastonemius</td>
</tr>
<tr>
<td></td>
<td>Peroneus</td>
</tr>
<tr>
<td></td>
<td>Perforans</td>
</tr>
<tr>
<td></td>
<td>Extensor pedis</td>
</tr>
<tr>
<td></td>
<td>Suspinosy ligament</td>
</tr>
</tbody>
</table>
### Teaching Methods

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Lecture and discussion using overhead transparencies or other charts of skeletal and muscular structure of the horse.</td>
</tr>
<tr>
<td>B.</td>
<td>Field trip to horse farms to observe animals and the interrelationship of the bones and muscles of legs.</td>
</tr>
<tr>
<td>C.</td>
<td>Supervised study.</td>
</tr>
<tr>
<td>D.</td>
<td>Prepare mimeo drawings of legs and muscles for handouts.</td>
</tr>
</tbody>
</table>

### Student Application Activities

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>List the bones of the front leg.</td>
</tr>
<tr>
<td>B.</td>
<td>List the muscles of the front leg.</td>
</tr>
<tr>
<td>C.</td>
<td>Label the bones and muscles on a drawing.</td>
</tr>
<tr>
<td>D.</td>
<td>Store discovered information in a notebook.</td>
</tr>
</tbody>
</table>

### Evaluation Procedures

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Oral or written test on identification of no fewer than ten bones and ten muscles of the hind leg.</td>
</tr>
</tbody>
</table>

### Table 1

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Supervised study.</td>
</tr>
<tr>
<td>B.</td>
<td>Use of transparencies or charts.</td>
</tr>
<tr>
<td>C.</td>
<td>Field trip to horse farms to observe the muscles of legs.</td>
</tr>
<tr>
<td>D.</td>
<td>Procure front and rear legs of a dead horse for student supervised study.</td>
</tr>
<tr>
<td>E.</td>
<td>Prepare a mimeographed drawing of the hind leg.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>List the bones of the hind leg.</td>
</tr>
<tr>
<td>B.</td>
<td>List the muscles of the hind leg.</td>
</tr>
<tr>
<td>C.</td>
<td>Relate bones to muscular functions.</td>
</tr>
<tr>
<td>D.</td>
<td>Touch and feel the muscles of a live horse.</td>
</tr>
<tr>
<td>E.</td>
<td>Study the bone structured example of a deceased horse.</td>
</tr>
<tr>
<td>F.</td>
<td>Store pictures and information in a notebook.</td>
</tr>
</tbody>
</table>

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### OBJECTIVES BY UNIT

**Objective #3**

Name the parts of the foot viewed from the side and bottom while using an illustration or chart.

<table>
<thead>
<tr>
<th>Classes of structure</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bones</td>
<td></td>
</tr>
<tr>
<td>Elastic</td>
<td></td>
</tr>
<tr>
<td>Sensitive</td>
<td></td>
</tr>
<tr>
<td>Horny</td>
<td></td>
</tr>
<tr>
<td><strong>The Foot</strong></td>
<td></td>
</tr>
<tr>
<td>Cannon bone</td>
<td></td>
</tr>
<tr>
<td>Long pastern</td>
<td></td>
</tr>
<tr>
<td>Short pastern</td>
<td></td>
</tr>
<tr>
<td>Coffin bone</td>
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<tr>
<td>Naricular bone</td>
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<tr>
<td>Fetlock joint</td>
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<tr>
<td>Coffin joint</td>
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<tr>
<td>Pastern joint</td>
<td></td>
</tr>
<tr>
<td>Extensor tendon</td>
<td></td>
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<tr>
<td>Deep flexor tendon</td>
<td></td>
</tr>
<tr>
<td>Perioplic ring</td>
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<tr>
<td>Coronary band</td>
<td></td>
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<tr>
<td>Plantan cushion</td>
<td></td>
</tr>
<tr>
<td>Sensitive frog</td>
<td></td>
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<tr>
<td>Horny frog</td>
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<tr>
<td>Periople</td>
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<tr>
<td>Sensitive sole</td>
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<tr>
<td>Horny sole</td>
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<tr>
<td>Sensitive laminae</td>
<td></td>
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<tr>
<td>Horny wall</td>
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<tr>
<td>White line</td>
<td></td>
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<tr>
<td>Ergant</td>
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</tr>
</tbody>
</table>

**The Hoof**

- Frog
- Heel
- Bar
- Sole
- White line
- Wall
- Toe
- Quarter
- Heel
## Objectives by Unit

### Unit 2 - Abnormal Posture

**Objective #4**
List abnormal standing positions of a horse's front and hind legs.

- **A. Front legs**
  - Good
  - Buck knee
  - Calf knee

- **B. Front or hind legs**
  - Tied in at the knee
  - Round bone
  - Short straight pastern
  - Coon-footed
  - Too long cannon

### Unit 3 - Hoof Trimming

**Objective #5**
Recognize the different "ways of going" that need to be corrected by means of corrective shoeing.

- **A. Ways of Going**
  - Low strides
  - Head movements
  - Strides far
  - High gaited

- **B. Methods of shoeing**

- **C. Types of shoes**

**Objective #6**
Demonstrate the proper techniques of trimming a horse's hoof.

- **A. Equipment**
  - Farmers' apron
  - Hoof pick
  - Hoof knife
  - Rasp
  - Calipers
  - Foot level

- **B. Picking up foot**

---

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<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Discussion with illustrations of each form of normal and abnormal posture. B. Field trip to horse farm to demonstrate methods of viewing and detecting abnormalities.</td>
<td>A. List different abnormalities B. Keep a picture or drawing file of each in a notebook. C. Observe and study the abnormal leg positions as directed by the teacher. D. Observe each horse from all angles while the animal is standing squarely on all four legs. Students list as many faults as are visible. The procedure should be repeated as many times as class time allows.</td>
<td>A. Instruction evaluation of student identification of abnormalities of five different abnormalities in live situations.</td>
</tr>
<tr>
<td>A. Supervised study. B. Supervised experience. C. Field trip D. Demonstration E. Resource Person - Blacksmith</td>
<td>A. Note the acceptable and unacceptable ways of going. B. List methods of correcting each unacceptable way of going.</td>
<td>A. Teacher evaluation of student recognition of four ways of going.</td>
</tr>
<tr>
<td>A. Demonstrate the use for the Farrier's tools, proper procedure for picking up and holding horses' legs. B. Supervised practice. C. Resource person - Blacksmith</td>
<td>A. Observe techniques of picking up feet and smoothing feet. B. Practice the demonstrated techniques.</td>
<td>A. Teacher evaluation of student demonstrated techniques.</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
<td>EVALUATION PROCEDURES</td>
</tr>
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<td>---------------------------------------------------------------------------------</td>
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<tr>
<td>Lecture and discussion concerning classes of structures.</td>
<td>A. Questions pertaining to classes of structure.</td>
<td>A. Oral or written test, listing no fewer than 15 parts of the foot, and noting which are sensitive.</td>
</tr>
<tr>
<td>E. Supervised study of the foot</td>
<td>B. Sketch and label horses foot.</td>
<td>B. Sketch and label the hoof of a horse showing no fewer than seven parts.</td>
</tr>
<tr>
<td>Use of references</td>
<td>C. Identify all parts of the foot.</td>
<td></td>
</tr>
<tr>
<td>Use of examples live and preserved</td>
<td>D. Identify parts of the horse's hoof, note which are sensitive and which are non.</td>
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</tr>
<tr>
<td>C. Use foot of processed bones of deceased horse.</td>
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</tr>
</tbody>
</table>

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### Objectives by Unit

<table>
<thead>
<tr>
<th>Unit 4 - Lameness and Unsoundness</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective #7 List the causes of lameness and unsoundnesses of horses' legs and hooves. | A. Types of unsoundnesses  
- Blood rain  
- Bog rain  
- Bone rain  
- Bowed tendon  
- Bucked shins  
- Calf kneed  
- Capped hock  
- Cocked ankles  
- Contracted feet  
- Corns  
- Curb  
- Founder  
- Fractured fibula  
- Gramel  
- Knee sprung  
- Navicular disease | Osselets  
- Popped knee  
- Quarter crack  
- Quitter  
- Ringbone  
- Scratches  
- Sesamoid fractures  
- Shoe boil  
- Side bones  
- Splints  
- Stifled  
- Stringhalt  
- Supensory ligament  
- Sprain  
- Thorough  
- Thrust  
- Sin puffs |

| Objective #8 Illustrate hoof abnormalities | A. Examples  
- Founder  
- Dropped sole  
- Quarter crack  
- Seedy toe |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and illustrated talk</td>
<td>A. Compile a list of the unsoundnesses explained and note the differences.</td>
<td>A. Teacher evaluation of prepared list of causes, symptoms and controls.</td>
</tr>
<tr>
<td>B. Use of resource person (Veterinarian)</td>
<td>B. Prepare questions to be answered by resource persons.</td>
<td>B. Oral or written test of ten types of unsoundnesses complete with causes, symptoms and controls.</td>
</tr>
<tr>
<td>C. Field trip to College of Veterinary Medicine; explore examples of these unsoundness</td>
<td>C. List causes, symptoms, and controls of each unsoundness condition.</td>
<td></td>
</tr>
<tr>
<td>D. Supervised study in small groups. Let each group research causes, symptoms and controls for an equal number of types, and prepare a report for the rest of the class.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. Observation of abnormality.</td>
<td>A. Teachers' evaluation of the students' ability to identify the abnormality.</td>
</tr>
<tr>
<td>B. Use of photos - animal with the abnormality</td>
<td>B. Collect photographs or prepare sketches of the abnormalities.</td>
<td></td>
</tr>
<tr>
<td>C. Field trip to a farm or college of Veterinary Medicine to observe</td>
<td>C. Maintain a notebook</td>
<td></td>
</tr>
<tr>
<td>E. Problem solving.</td>
<td>D. Offer possible solutions.</td>
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<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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</tr>
</tbody>
</table>
| Unit 5 - Wrapping Legs  
Objective #9  
Demonstrate the proper procedure for wrapping a horse's leg. | A. Materials needed for wraps  
- Cotton  
- Foam Rubber  
- Quilting  
- Bandages - 6" wide - 3 yards long |
| Objective #10  
Demonstrate the proper method of applying hoof conditioners when given commercial conditioners and materials needed. | A. Hoof conditioners |

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Note taking</td>
<td>A. Instructors</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Study</td>
<td>evaluation of</td>
</tr>
<tr>
<td>C. Instructor duplicate fig 94</td>
<td>C. Practice wrapping following the demonstrated procedure.</td>
<td>student application.</td>
</tr>
<tr>
<td>D. Instructor will demonstrate and explain the difference between a leg wrapped for a horse standing in a stall and a horse being prepared for shipping.</td>
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<tr>
<td>E. Supervised practice.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Demonstration</th>
<th>A. Practice applying conditioners.</th>
<th>A. Instructors evaluation of student application.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Supervised Practice</td>
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</tr>
</tbody>
</table>

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Title - CARE OF FEET AND LEGS

Code - 01.010103-04

RESOURCE MATERIALS

Books - Care and Training of the Trotter and Pacer
The United States Trotting Association
750 Michigan Avenue
Columbus, Ohio 43216

Horse Science Handbook - 1963
Dr. M. E. Ensminger
Clovis, California 93612

Horse Science Handbook - 1964
Dr. M. E. Ensminger
Clovis, California 93612

Horse Science Handbook - Volume 3
Dr. M. E. Ensminger
Clovis, California 93612

Periodicals - The Western Horseman
Title - SWINE PRODUCTION

DESCRIPTION:

The student will study the areas of feeding, breeding, disease control, and management specific to swine production.

The student will visit commercial swine operations to familiarize himself with the modern commercial operations.

It is further suggested that in those areas where swine enterprises are of greater importance, several modules be developed covering such areas as feeding, breeding, swine health, marketing and management.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>MAJOR DIVISION</th>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Selecting for Swine Herd</td>
<td>3</td>
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<tr>
<td>2. Feeding the Swine Herd</td>
<td>6</td>
</tr>
<tr>
<td>3. Swine Disease and Parasites</td>
<td>5</td>
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<tr>
<td>4. Record Keeping and Registration</td>
<td>2</td>
</tr>
<tr>
<td>5. Swine Management</td>
<td>( \frac{1}{17} )</td>
</tr>
</tbody>
</table>

Revised August '75
Title - SWINE PRODUCTION

Objectives to be obtained:

The student will be able to:

1. Identify from illustrations or observation of live animals eight of the common recognized breeds or crosses of swine.

2. List the purposes for those breeds common to the local geographical area.

3. Correctly identify an animal using terms of the industry.

4. Determine the market demand for quality animals, by comparing cost factors of raising animals with market value, using no fewer than three different markets.

5. Select 5 foundation hogs that will produce progeny to meet the market demand for a high quality animal, using techniques and growth records, when given the illustrations and records of 10 animals.

6. Determine the nutritive needs of the various age classes of swine, include market fattening.

7. Plan feeding rations that will meet nutritive needs for each age class of swine.

8. Demonstrate to instructors satisfaction a working knowledge of the causes, symptoms (age affected), treatment, control and prevention of at least 15 diseases, conditions and stresses of economic importance in the state or area.

9. Outline a planned disease prevention and sanitation program for the swine herd.

10. Develop and maintain necessary health, breeding and reproduction records of a given swine herd.

11. Accurately prepare registration and transfer papers for pure bred swine, when given the proper information and application blanks.

12. Accurately ear notch or tatoo swine for permanent identification purposes with method accepted by breed association.

13. Plan a housing system and equipment needs for a given swine herd based on an approved management system.

14. Develop a complete program for raising swine by selecting and organizing information discussed and studies in the first 12 objectives.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Selecting for swine herd.</strong></td>
<td><strong>A. Identification of the breeds of swine</strong></td>
</tr>
<tr>
<td>Objective 1 Identify from illustrations or observation of live animals eight of the common recognized breeds or crosses of swine.</td>
<td><strong>1. Types of swine</strong></td>
</tr>
<tr>
<td></td>
<td>- bacon</td>
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<td></td>
<td>- lard</td>
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<td>- meat</td>
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<td>- Popularity</td>
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<td>- Origin</td>
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<td>- Color</td>
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<td>- Distinctive breed characteristics</td>
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<td>- Other distinguishing characteristics</td>
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<td>- Disposition</td>
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<td>- litter size</td>
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<td>- grazing ability</td>
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<td>- rate of gain</td>
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<td>- market quality</td>
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<tr>
<td><strong>Objective 2</strong> List the purposes for those breeds common to the local geographical area.</td>
<td><strong>A. Effects of cross breeding</strong></td>
</tr>
<tr>
<td></td>
<td>1. Crosses common to area</td>
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<td></td>
<td>2. Purposes of the cross</td>
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<td>3. Selection for cross</td>
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<td>4. Results of the cross</td>
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<td>- color characteristics</td>
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<td>- physical characteristics compared to parents</td>
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<td>- other distinguishing characteristics</td>
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<td>- Disposition</td>
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<td>- litter size</td>
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<td>- rate of gain</td>
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<td></td>
<td>- market quality</td>
</tr>
<tr>
<td><strong>Objective 3</strong> Correctly identify an animal using terms of the industry.</td>
<td><strong>A. Terms to be included</strong></td>
</tr>
<tr>
<td></td>
<td>- Terms to be included</td>
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<tr>
<td></td>
<td>- Sex and age of animal/market terms</td>
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<td></td>
<td>- Barrow</td>
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<td>- gilt</td>
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<td>- sow</td>
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<td>- hog</td>
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<td></td>
<td>- boar</td>
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<td></td>
<td>- stag</td>
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</tbody>
</table>

<p>| 138 | 4 |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
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</thead>
<tbody>
<tr>
<td>A. Chalkboard presentation of breeds of swine and their characteristics - coupled with color slides or film strip of animals of the breed. B. Supervised study of texts of the types and breeds of swine.</td>
<td>A. Make a chart indicating the means of identification of hogs. B. Prepare oral reports on breeds of swine.</td>
<td>A. Oral or written test. Picture identification. Characteristics of the various breeds and/or crosses.</td>
</tr>
<tr>
<td>A. Supervised study - oral reports on breeds by students covering the same information. B. Supervised study - students prepare, and send a letter requesting general information concerning a specific breed of hogs, source of breeding stock in the area and information on requirements for registration and transfer.</td>
<td>A. Letter preparation and sending for use in the report.</td>
<td>A. Instructor's evaluation of the written letter.</td>
</tr>
<tr>
<td>A. Lecture and discussion using chalkboard to identify terms.</td>
<td>A. Prepare a list of terms used in the swine industry.</td>
<td>A. Written quiz - term identification</td>
</tr>
</tbody>
</table>
**OBJECTIVES BY UNIT**

<table>
<thead>
<tr>
<th>Unit 1 continued</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 4</td>
<td>A. Market demand for swine</td>
</tr>
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<td></td>
<td>Market classes</td>
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<td></td>
<td>hog and pigs</td>
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<td>use selection</td>
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<td>sex</td>
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<td>weight</td>
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<td>color</td>
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<td>Seasonal conditions</td>
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<td>cycle of high and low</td>
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<td>highs</td>
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<td>June-August - gilts and barrows</td>
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<td>February-March - sows</td>
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<td>August-September - sows</td>
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<td>lows</td>
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<td>November-May - gilts and barrows</td>
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<td>April and October - sows</td>
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<td>day of week</td>
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<td>Monday high receipts</td>
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<td>local variations</td>
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<td></td>
<td>Other local factors and conditions</td>
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<td></td>
<td>holidays - Easter, Christmas</td>
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<td></td>
<td>demand for special types as roasters</td>
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</tbody>
</table>
### TEACHING METHODS

A. Chalkboard lecture discussion of general marketing patterns showing long range hog cycling in numbers to prices & yearly variations in numbers and prices. (If market has a weekly cycle indicate this unless there is a single day hog market) - Overlays or prepared charts are useful here.

B. Assigned reading from text - *Swine Science* or *Animal Science. Marketing and slaughtering of hogs.*

C. Field trips to local market center to talk with buyer in terms of the desire at that market for quality animals. Prices to be expected at various seasons and supply of animals passing through the yard. This can also be done by a visit to a commercial producer where he discusses the marketing situation as he sees it.

### STUDENT APPLICATION ACTIVITIES

A. Preparation of graphs or charts showing the cycles of hogs production, marketing producers and prices received.

B. Notes taken on field trip to determine the local demands for market hog quality.

### EVALUATION PROCEDURES

A. Written test

B. Written report of the local market requirements and conditions to the satisfaction of the instructor.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1 continued</td>
<td>A. Review basic genetics of inheritance.</td>
</tr>
<tr>
<td>Objective 5</td>
<td>Measureable characteristics</td>
</tr>
<tr>
<td>Select 5 foundation hogs that will produce progeny to meet the market demand for a high quality animal, using judging techniques and growth records, when given illustrations and records of 10 animals.</td>
<td>. carcass length . back fat thickness</td>
</tr>
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<td></td>
<td>. leg length</td>
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<td>. weaning weight</td>
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<td>. birth weight</td>
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<td>. Inherited undesirables</td>
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<td>. umbilical hernia</td>
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<td>. scrotal hernia</td>
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<td>. inherited or blind nipples</td>
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<td>. cryptor chidism</td>
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<td>. fetals</td>
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<td>. Type inheritance</td>
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<td>. strong and weak points in animals</td>
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<td></td>
<td>. length and depth of body</td>
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<td>. feet and legs</td>
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<td></td>
<td>. shoulders</td>
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<td></td>
<td>. rump</td>
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<td></td>
<td>. hams</td>
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<tr>
<td></td>
<td>. smoothness and blushing of all parts</td>
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<td></td>
<td>. conformation and breed type</td>
</tr>
</tbody>
</table>

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### TEACHING METHODS

<table>
<thead>
<tr>
<th>A. Lecture - discussion of basic genetics as it is applied to swine; emphasis on multiple gene factors.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stress those characteristics that have been identified as measurable and demonstrate through problems how this should work on paper.</strong></td>
</tr>
<tr>
<td><strong>Stress importance of selecting animals that are free of lethals and free of undesirable traits that are not fully identified as to type or heredity.</strong></td>
</tr>
<tr>
<td><strong>Students are to recognize that this will not always work out as planned as much is not known of inheritance.</strong></td>
</tr>
<tr>
<td><strong>B. Field trip - visit herd when sows have recently farrowed and evaluate animals in terms of their type.</strong></td>
</tr>
<tr>
<td><strong>Compare the litter to the sows and boar.</strong></td>
</tr>
<tr>
<td><strong>C. Supervised study of selection by type and confirmation as well as swine genetics (Swine Science has excellent chapters on breeding and selection.</strong></td>
</tr>
<tr>
<td><strong>Overhead chart and/or ditto of parts of the hog and desirable characteristics of meat type hog as well as common faults.</strong></td>
</tr>
<tr>
<td><strong>D. Field trip to commercial hog producers for: backfat probe demonstration coordinated with extension personnel for a demonstration for use of ultrasonic equipment, if such equipment is available.</strong></td>
</tr>
<tr>
<td><strong>E. Field trip to slaughter house for carcass evaluation.</strong></td>
</tr>
<tr>
<td><strong>It is suggested if possible, to follow up the use backfat probe and ultra sonic equipment for visual evaluation of some of the same animals.</strong></td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

<table>
<thead>
<tr>
<th>A. Problem solving of genetic situations showing inheritance factors, lethals, sex, color, growth and size.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B. Examination of boars, sows and litters to observe inherited factors.</strong></td>
</tr>
<tr>
<td><strong>C. Select pigs from litter that demonstrate desired type and weight for age at time of the visit.</strong></td>
</tr>
<tr>
<td><strong>D. Supervised study of text assignments and ditto sheets of hog parts and characteristics.</strong></td>
</tr>
<tr>
<td><strong>E. Observation and participation in the use of the equipment. Grading of carcasses according to the USDA standards.</strong></td>
</tr>
</tbody>
</table>

### EVALUATION PROCEDURES

<table>
<thead>
<tr>
<th>A. Written quiz - identification of parts of the hog and desirable traits of the meat hog.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B. Written or oral test of the grading procedures and evaluation of types to carcass value.</strong></td>
</tr>
<tr>
<td><strong>C. Written test.</strong></td>
</tr>
<tr>
<td><strong>Problem solving of mechanisms of inheritance. Solve at least 5 problems demonstrating understanding of principles of inheritance.</strong></td>
</tr>
<tr>
<td><strong>D. Selecting individual gilts from litter for breeding stock on the basis of observation of sow, bear and gilts, to instructors satisfaction.</strong></td>
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<tr>
<td>OBJECTIVES BY UNIT</td>
</tr>
<tr>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Unit 1 continued</td>
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<tr>
<td>Objective 5 continued</td>
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<tr>
<td>Unit 2 - Feeding the swine herd</td>
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<tr>
<td>Objective 6</td>
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</tbody>
</table>

Unit 2 - Feeding the swine herd
Objective 6
Determine the nutritive needs of the various age classes of swine.
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>G. Interview a local breeder for his evaluation of several pedigrees for strong points to look for in and what to avoid in the pedigree.</td>
<td>G. Practice writing a pedigree using animals from several pedigrees as parents.</td>
<td>F. Select a boar or gilt on the basis of pedigree evaluation to the instructor's satisfaction.</td>
</tr>
<tr>
<td>H. Supervised study on the basis of the previous materials and visits to area farms. Students should have gained an idea of the individual breeds, his breeding program and management of his stock. From this based on lecture-discussion of traits to look for students should be able to select the source of their breeding stock.</td>
<td>H. Select a boar or gilt by use of pedigree.</td>
<td>Evaluation by instructor of written plan.</td>
</tr>
<tr>
<td>A. Lecture – discussion of the needs of the classes of stock.</td>
<td>I. Preparation of a written report of the procedure they plan to follow in the selection of breeding stock for the swine herd.</td>
<td></td>
</tr>
<tr>
<td>B. Supervised study using chapter XXXVI, Animal Science Chapter VI, Swine Science, Chapter 4 Raising Swine Chapters XXXIV and XXXV and appendixes tables Morrison's Feeds and Feeding.</td>
<td>A. List and illustrate the age classes of swine.</td>
<td>A. Written quiz of importance of various nutritional material.</td>
</tr>
<tr>
<td></td>
<td>B. Students make charts showing nutritional needs of various classes of swine.</td>
<td></td>
</tr>
</tbody>
</table>
### Objectives by Unit

<table>
<thead>
<tr>
<th>Unit 2 continued</th>
<th>Objective 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan feeding rations that will meet nutritive needs for each class of swine.</td>
<td></td>
</tr>
</tbody>
</table>

| A. Study of breed materials available and complete feeds in terms of: |
|------------------|-------------|
| Protein |
| Energy |
| Vitamins |
| Minerals |
| Limiting factors |

| B. Feeding programs to be developed for: |
|------------------|-------------|
| Bred gilts and sows |
| Nursing sows |
| Growing pigs |
| Finishing hogs |
| Herd boars |

### Unit 3 - Swine disease and parasites

| Objective 8 |
|------------------|-------------|
| Demonstrate to instructors a working knowledge of the causes, symptoms (age affected), treatment, control and prevention of at least 15 diseases, conditions and stresses of economic importance in the state or area. |

| Disease stress or conditions that are to be considered, including: |
|------------------|-------------|
| A. Infectious diseases |
| Hug cholera |
| Erysipelas |
| TGE (transmissible gastro-enteritis) |
| Brucellosis |
| Leptosperiosis |
| VPP (virus pig pneumonia) |
| AR (antrophic rhinitis) |
| T.B. |
| Anthrax |
| H.S. (shipping fever) |
| Vesicular exanthema |
| Vibronic dysentary |
| Necrotic enteritis |
| B. Nutritional disease: |
| Baby pig anemia |
| B-vitamin deficiencies |
| Parakeratosis |
| Trace mineral deficiencies |
| Rickets |
| C. Parasites: |
| Internal |
| External |

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture-discussion of ration development.</td>
<td>A. Determine feed materials available from local farms and mills.</td>
<td>Teacher evaluation of:</td>
</tr>
<tr>
<td>B. Supervised study of feed materials using texts above.</td>
<td>B. Identification of various feed materials.</td>
<td>A. Chart of materials and feeding values.</td>
</tr>
<tr>
<td>C. Let students procure a list of feed materials available.</td>
<td>C. Chart of feeding values for those feeds available for feeding purposes.</td>
<td>B. Visual identification of ingredient feeds (80% accuracy).</td>
</tr>
<tr>
<td>D. Individual instruction in ration development for the various classes of swine.</td>
<td>D. Develop rations for each age class of swine in given situation.</td>
<td>C. Problem to determine cost of a ration.</td>
</tr>
<tr>
<td>E. Comparison of rations developed with suggested rations from texts.</td>
<td>E. Determine cost of ration with idea of least cost ration that meets nutritional needs.</td>
<td>D. Written test - given a specific age class and a Feeds and Feeding text, develop a mixed ration.</td>
</tr>
<tr>
<td>F. Determination of the cost of rations.</td>
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<tr>
<td>G. Field trip to farm for observation and information in regards to sound feeding programs for various classes of swine.</td>
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</tbody>
</table>

A. Lecture and discussion of need for disease information.  
B. Supervised study using references.  
C. Preparation of disease information sheets.  
D. Slide and/or tapes and filmstrips of specific diseases.  
E. Resource person, area veterinarian on disease common to the area with his recommendations for treatment and control.  
F. Field trip to area farms to observe the sanitation and precaution practices followed by modern operations.  
G. Demonstration handling of hogs to take temperature, respiration and pulse rate.  
H. Demonstration of method used to handle hogs for treatment  
I. Discussion of ways to reduce stress on the swine herd at various times of the year through sound management practices.  

A. Student compile notebook material containing specific information of the cause, symptom, age affected, treatment control and prevention of each disease studied.  
B. Report on sanitation measures used on area farm for disease prevention and controls.  
C. Demonstrate handling hogs for temperature, respiration, pulse and general handling of sick hogs.  
D. Notes taken on the basis of the group discussion.  

A. Teacher evaluation of student notebook, for content completeness and accuracy on each disease studied.  
B. Written test - List causes, symptoms, and control of 10 swine diseases.  
C. Ability to take temperature, respiration rate and pulse of animal accurately.  
D. Ability to recognize stress in animals with 80% accuracy and reduce the condition.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td>Unit 3 continued</td>
<td>A. Review disease prevention from above.</td>
</tr>
<tr>
<td>Objective 9</td>
<td>A. Record keeping requirements.</td>
</tr>
<tr>
<td>A. Planned disease prevention and sanitation program for the swine herd.</td>
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<tr>
<td></td>
<td>. Those needed</td>
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<td></td>
<td>. Simple in form for use</td>
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<tr>
<td></td>
<td>. Permanent in nature</td>
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<tr>
<td>Unit 4 - Record keeping and registration</td>
<td>B. Litter record keeping</td>
</tr>
<tr>
<td>Objective 10</td>
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<tr>
<td>Develop and maintain necessary health, breeding and reproduction records of a given swine herd.</td>
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<td></td>
<td>. Group information</td>
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<td></td>
<td>. Individual information</td>
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<tr>
<td>Objective 11</td>
<td>C. Individual sow record showing</td>
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<tr>
<td>Accurately prepare registration and transfer papers for pure bred swine, when given the proper information, and application blank.</td>
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<td></td>
<td>. Identity</td>
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<td></td>
<td>. Production record</td>
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<td>. Health record</td>
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<tr>
<td>Objective 12</td>
<td>A. Review information received from Unit 1 when letter was sent to breed association for information regarding breed.</td>
</tr>
<tr>
<td>Accurately ear notch or tattoo swine for permanent identification purposes with method accepted by breed association.</td>
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<td></td>
<td>. Requirements for registration</td>
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<td></td>
<td>. Preparation of necessary forms</td>
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<td></td>
<td>A. Information provided by breed association</td>
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<td></td>
<td>. Ear notching</td>
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<td>. Tatooing</td>
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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study of various record keeping forms dealing with the swine herd as given in <em>Swine Science</em> pgs. 127-130 or <em>Raising Swine</em> pgs. 94-95. B. Individual or group development of necessary records to meet criteria given. C. Supervised practice using sample problems record keeping for the swine herd, using individual and group instruction.</td>
<td>A. Development of record forms. B. Practice problems.</td>
<td>A. Teacher evaluation of preparation of necessary forms. B. Teacher evaluation of ability to keep necessary records through practical exam of record keeping.</td>
</tr>
<tr>
<td>A. Individual instruction in the preparation of registration and transfer papers. B. Borrow registration and herd book from a farmer for group to examine.</td>
<td>A. Prepare sample registration forms, carefully and accurately.</td>
<td>A. Teacher evaluation of accurate, complete preparation of registration and transfer papers of purebred hogs.</td>
</tr>
<tr>
<td>A. Use chalkboard and previously prepared cardboard ears for demonstration. B. Demonstrate correct techniques for tattooing or ear notching of animals for permanent identification, on live animals. C. Supervised practice.</td>
<td>A. Student practice of ear notching using cardboard. B. Develop ability to &quot;read&quot; information given by other students. C. Practice on live hogs.</td>
<td>Teacher evaluation: A. Ability to tattoo and ear notch live animals. B. Ability to &quot;read&quot; ear notch.</td>
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</tbody>
</table>
**Title - SWINE PRODUCTION**

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td><strong>Unit 5 - Swine Management</strong></td>
<td><strong>A. Systems available</strong></td>
</tr>
<tr>
<td>Objective 13</td>
<td>- Pasture system - individual house</td>
</tr>
<tr>
<td>Plan housing system and equipment needs for the swine herd based on an approved</td>
<td>- Combination system</td>
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<td>management system.</td>
<td>- Complete confinement system</td>
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<td><strong>B. Advantages and disadvantages of each system in terms of</strong></td>
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<td>- Type of feed facilities</td>
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<td></td>
<td>- Manure handling</td>
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<td>- Land available</td>
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<td></td>
<td>- Controlled environment</td>
</tr>
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<td>- Investment in buildings and equipment</td>
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<td><strong>C. Equipment needs</strong></td>
</tr>
<tr>
<td></td>
<td>- Breeding crates</td>
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<td></td>
<td>- Creeps</td>
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<td>- Heat lamps</td>
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<td>- Farrowing crates</td>
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<td>- Loading chutes</td>
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<td>- Self feeders</td>
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<td>- Shade</td>
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<td>- Watering system</td>
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<td>- Cooling systems</td>
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<td>- Fencing</td>
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<td>- Lighting</td>
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<td><strong>D. Space requirements for animals</strong></td>
</tr>
<tr>
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<td><strong>Objective 14</strong></td>
</tr>
<tr>
<td>Develop complete program for raising swine by selecting and organizing information</td>
<td><strong>A. Selecting the animals for the herd.</strong></td>
</tr>
<tr>
<td>discussed and studied in the first 12 objectives.</td>
<td>- Number and age class of stock</td>
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<td><strong>B. Plan a complete feeding program</strong></td>
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<td>- Estimate of feeds needed for the year by each class.</td>
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<td>- Determine costs for the feeding program</td>
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<td></td>
<td><strong>C. Demonstrate the sanitation and disease control program.</strong></td>
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<td></td>
<td><strong>D. Records needed for operation.</strong></td>
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<td></td>
<td><strong>E. Housing requirements for the herd.</strong></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture-discussion of housing system and equipment.</td>
<td>A. Note taking on lecture and the supervised study program.</td>
<td>A. Teacher evaluation of floor plan.</td>
</tr>
<tr>
<td>B. Supervised study Chapter X Swine-Science-and-Successful Farming magazine articles</td>
<td>B. List observations made while on the field trip to area farm.</td>
<td>B. Class evaluation of the housing program presented.</td>
</tr>
<tr>
<td>C. Field trip to area farms to observe housing systems and talk with owner about advantages, problems and desired changes for the future for his situation.</td>
<td>C. Preparation of floor plan for swine facility that reflects careful consideration of various programs.</td>
<td></td>
</tr>
<tr>
<td>D. Supervised study - student individual planning for a swine herd housing system by making floor plan drawing of set of facilities.</td>
<td>D. Oral presentation to class for evaluation.</td>
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<tr>
<td>E. Oral presentation of developed system before class for evaluation.</td>
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</tr>
<tr>
<td>A. Individual instruction of students working on the planned program for the swine herd.</td>
<td>A. Preparation of the final plan.</td>
<td>A. Teacher evaluation of final plan.</td>
</tr>
</tbody>
</table>

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RESOURCE MATERIALS

A. Books -
*Stockman's Handbook, M.E. Ensminger; Interstate Publishers
Raising Swine, F.P. Dayoe, J.L. Krider, McGraw Hill, 1952
Swine Production, C.E. Dundy, R.V. Diggins, Prentice Hall Inc. 1956
Hoards Dairyman Feed Guide - Staff Fort Atkinson Wisconsin
Livestock Breeding, Ohio Agricultural Education Curriculum Materials Service

*Ensminger's texts are all similar. Where Swine is a major enterprise his text Swine Production would be favored over the other two. Where Swine is of a minor importance Animal Science is favored, because the same text will cover the more important aspects and also covers all classes of livestock and poultry. Stockman's Handbook is more tabular and a "how to" form of presentation. Approved practices covers the material in a more sketchy manner but would be satisfactory for a minor emphasis module. It should not be used alone.


C. Periodicals - Hoards Dairyman - Fort Atkinson Wisconsin
Successful Farming Magazine
Farm Quarterly Magazine, Cincinnati

D. Audiovisuals -
**MODULE OF INSTRUCTION**

**Title -** SHEEP PRODUCTION

**Code -** 01.01010105-01

**DESCRIPTION:**

The student will study the areas of selection, feeding, breeding, disease control, management, housing and marketing of sheep.

Visits to area farms where different types of sheep operations are carried on will be made to familiarize the student with the approved practices of the industry.

**MAJOR DIVISIONS OR UNITS OF CONTENT**

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Characteristics and type of sheep enterprises</td>
<td>1</td>
</tr>
<tr>
<td>2. Selecting stock</td>
<td>2</td>
</tr>
<tr>
<td>3. Breeding the farm flock</td>
<td>1</td>
</tr>
<tr>
<td>4. Feeding the farm flock</td>
<td>3</td>
</tr>
<tr>
<td>5. Disease and Health</td>
<td>4</td>
</tr>
<tr>
<td>6. Record keeping</td>
<td>1</td>
</tr>
<tr>
<td>7. Housing requirements and equipment</td>
<td>1</td>
</tr>
<tr>
<td>8. Sheep management practices</td>
<td></td>
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<tr>
<td>9. Marketing products</td>
<td>$\frac{3}{16}$</td>
</tr>
</tbody>
</table>

Revised June, 1974
OBJECTIVES to be obtained:

The student will:

1. Investigate the potential for a sheep enterprise in his area.
2. Identify 10 breeds of sheep as to characteristics and wool type and give the primary purpose for each breed as used in New York State.
3. Select the breed of sheep that will be profitable to the area.
4. Identify the 25 parts of the sheep from memory.
5. List 10 of the 17 factors to consider when selecting foundation animals and/or feeder lambs.
6. Plan a breeding management program for ewes and rams.
7. Plan a feeding program for commercial flock, lambs, purebred flock and rams.
8. Demonstrate a working knowledge of the cause, symptoms, treatment control and prevention measures for 10 diseases or conditions that affect sheep.
9. Plan a disease and parasite control program for a sheep enterprise.
10. Develop and maintain necessary records for a sheep enterprise.
11. Develop a plan for housing and pasturing a flock of sheep for a given situation.
12. Assist in each of the following management techniques: castration, docking, tagging, foot trimming, dipping or spraying sheep.
13. Plan a marketing program for sheep under various situations and the marketing of the fleece.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Characteristics and type of sheep enterprises</strong>&lt;br&gt;Objective #1&lt;br&gt;Investigate the potential for a sheep enterprise in his area.</td>
<td><strong>A. Factors that influence an enterprise</strong>&lt;br&gt;. Climate and general weather&lt;br&gt;. Topography&lt;br&gt;  - rough drier land&lt;br&gt;  - lamb crop&lt;br&gt;     - one or two crops per year&lt;br&gt;     - hot house&lt;br&gt;  - wool&lt;br&gt;  - purebred flock&lt;br&gt;  - Limited facilities necessary&lt;br&gt;  - housing requirement&lt;br&gt;  - equipment needs&lt;br&gt;  - labor requirements and distribution&lt;br&gt;  - Limited capital invested in animals&lt;br&gt;     - commercial ewes $10-30&lt;br&gt;     - commercial young ewes $20-24&lt;br&gt;     - purebred ewes $30-100&lt;br&gt;     - rams - $75-100&lt;br&gt;     - age&lt;br&gt;     - quality&lt;br&gt;     - year&lt;br&gt;  - Maintenance costs relatively low&lt;br&gt;     - $20 per head&lt;br&gt;  - Returns&lt;br&gt;     - $30 per head&lt;br&gt;  - Enterprise possibility&lt;br&gt;     - commercial ewe flock&lt;br&gt;     - purebred flock&lt;br&gt;     - feeder lamb&lt;br&gt;  - Individual requirements&lt;br&gt;     - interest and desire&lt;br&gt;     - shepherding ability</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
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</tr>
<tr>
<td>A. Lecture - discussion using charts prepared from Cost - Accounts Farms examine the cost-and-return-factors.</td>
<td>A. Note taking of factors involved in the success for this enterprise in the area.</td>
</tr>
<tr>
<td>B. Study of local market possibility for prices received.</td>
<td>B. Preparation for panel discussion and questions.</td>
</tr>
<tr>
<td>C. Examine the characteristics of the possible enterprise opportunities available in the area. References for above - Supervised study Cornell Bulletin #828 pages 3-8 Sheep Science Chapters I and II or Animal Science XXIII and XXIV</td>
<td>C. Written evaluation of field trip if used.</td>
</tr>
<tr>
<td>D. Discuss individual requirements for success in the program.</td>
<td>E. Panel discussion based on reference work above as to the possibility for success in enterprise in the area followed by a question-answer session.</td>
</tr>
<tr>
<td>F. Visit to commercial farm flock and discuss with the owner about the possibility.</td>
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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 2 - Selecting Stock</td>
<td>A. Breeds of sheep common to the area</td>
</tr>
<tr>
<td>Objective #2</td>
<td>- Cotswold</td>
</tr>
<tr>
<td>Identify 10 breeds of sheep as to</td>
<td>- Southdown</td>
</tr>
<tr>
<td>characteristics and wool type</td>
<td>- Shropshire</td>
</tr>
<tr>
<td>and give the primary purpose for each</td>
<td>- *Hampshire</td>
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<tr>
<td>breed as used in New York State.</td>
<td>- *Dorset</td>
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<td>- *Chevait</td>
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<td>- *Corriedale</td>
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<td>- *Suffolk</td>
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<td>- *Delaine-Merino</td>
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<td>- *Oxford</td>
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<td>- *Columbia</td>
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<td></td>
<td>- *most common</td>
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<td>B. Types of sheep</td>
<td>Fine wool</td>
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<td></td>
<td>- Mutton type</td>
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<td></td>
<td>- medium wool</td>
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<tr>
<td></td>
<td>- long wool</td>
</tr>
<tr>
<td></td>
<td>- Other</td>
</tr>
<tr>
<td></td>
<td>- carpet wool</td>
</tr>
<tr>
<td></td>
<td>- fur type</td>
</tr>
<tr>
<td>C. Place of origin</td>
<td></td>
</tr>
<tr>
<td>D. Color - Face, legs, ears</td>
<td></td>
</tr>
<tr>
<td>E. Head Characteristics</td>
<td></td>
</tr>
<tr>
<td>F. Other distinguishing characteristics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(If the instructor desires, he may list other breeds that produce</td>
</tr>
<tr>
<td></td>
<td>wools or fur that are not of importance in New York from an interest</td>
</tr>
<tr>
<td></td>
<td>stand point.)</td>
</tr>
<tr>
<td>Objective #3</td>
<td>A. Breed selection</td>
</tr>
<tr>
<td>Select the breed of sheep that will</td>
<td>- Personal preference</td>
</tr>
<tr>
<td>be profitable to the area.</td>
<td>- Quality and quantity of efficient lamb production</td>
</tr>
<tr>
<td></td>
<td>- Wool production</td>
</tr>
<tr>
<td></td>
<td>- Breeds available in area</td>
</tr>
<tr>
<td>Objective #4</td>
<td>A. Back</td>
</tr>
<tr>
<td>Identify the 25 parts of the sheep from</td>
<td>B. Barrel</td>
</tr>
<tr>
<td>memory:</td>
<td>C. Feet and legs</td>
</tr>
<tr>
<td></td>
<td>D. Head</td>
</tr>
<tr>
<td></td>
<td>E. Others listed on page 101 of Sheep Science</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Chart prepared or overlay giving the factors A-F in content.</td>
<td>A. Students make chart of breeds of sheep information.</td>
</tr>
<tr>
<td>B. Film strip &quot;Breeds of Sheep&quot; NASCO.</td>
<td></td>
</tr>
<tr>
<td>C. Slides or commercial films if available.</td>
<td></td>
</tr>
<tr>
<td>D. Pictures (in color if possible) of ewes and rams.</td>
<td></td>
</tr>
<tr>
<td>E. Supervised study of same references used in Unit #1.</td>
<td></td>
</tr>
<tr>
<td>A. Review letter writing. B. Supervised practice of preparation of a letter to a breed association of the individuals' choice requesting general information about the breed and the procedure used for registrations and transfers.</td>
<td>A. Prepare a brief report either written or oral and written on breed recommended for the area. B. Preparation of letter to be sent to breed association.</td>
</tr>
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<td></td>
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</tr>
<tr>
<td>A. Ref. Parts of the sheep or an overlay prepared showing labeled parts of the sheep. With copy prepared on ditto (Page 101 - Sheep Science)</td>
<td>A. Note taking B. Label the parts on the drawing.</td>
</tr>
<tr>
<td>B. Lecture - discussion C. Supervised study</td>
<td></td>
</tr>
</tbody>
</table>
**OBJECTIVES BY UNIT**

<table>
<thead>
<tr>
<th>Objective #5</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| List 10 of 17 factors to consider when selecting foundation animals and/or feeder lambs. | A. Factors to be considered  
. Uniformity of animals  
. Health  
. Age  
. Soundness of udder  
. Size  
. Adaptation  
. Pedigree (if purebred)  
. Rate of gain  
. Fleece quality and weight  
. Carcass quality  
. Evidence of multiple birth  
. Free of defects and abnormalities  
. Conformation  
. Mouth  
. Feet and legs  
. Availability  
. Price  
Some factors will vary in importance depending on the use intended of the animal. |

**Unit 3 - Breeding the farm flock**

<table>
<thead>
<tr>
<th>Objective #6</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Plan a breeding management program for ewes and rams. | A. Factors affecting reproduction  
. Estrus cycle of ewes  
. Day length - photoperiod  
. Temperature  
. Nutritional levels  
. Age of puberty and breeding  
. Conception methods - identification  
. Condition of the ram  
B. Preparation of stock for breeding  
. Ewes  
. Rams  
. Nutrition |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture - discussion of selection factors. B. Field trip to farm flock to select animals for different purposes - purebred stock - feeder lamb - commercial stock. Discuss with owner. C. Demonstration for handling sheep to include: Catching and holding, Fleece examination, Conformation examination, Aging the animal by mouth. D. Ditto sheet (Sheep Science - Page 109) Determining Age of Sheep by teeth. E. If in an area where there is a livestock sale-attend the sale either to purchase animals or to observe.</td>
<td>A. Note taking on selection factors with the instructor and on field trip with the owner. B. Examination of animals for Fleece, Conformation, Age. C. Study ditto sheet on age by mouth. D. Select several animals from flock for practice.</td>
<td>A. Test oral or written - Name 10 factors to consider, when selecting foundation stock or feeder lamb. B. Teacher evaluation of students' ability to handle animals carefully. C. Teacher evaluation of students' ability to age animals. D. Teacher evaluation of students' ability to select live animals based on desired selection practices.</td>
</tr>
</tbody>
</table>

A. Lecture on reproduction of sheep with emphasis on heat period factors. B. Supervised study Sheep Science Chapter VI especially pages 180-191. C. Field trip to farm flock to discuss with the owner the breeding program and management of the flock that he used. D. Discussion questions end of Chapter VI either as a written - oral exercise. | A. Note taking based on lecture and field trip. B. Discussion questions end of Chapter VI. | A. Teacher evaluation Written report of sound program for management of the flock at time of breeding. |
# OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 4 - Feeding the farm flock</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td>Objective #7</td>
<td>A. Determine nutritional needs for animals</td>
</tr>
<tr>
<td></td>
<td>Protein need</td>
</tr>
<tr>
<td></td>
<td>Energy</td>
</tr>
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<td></td>
<td>Minerals</td>
</tr>
<tr>
<td></td>
<td>Vitamins</td>
</tr>
<tr>
<td></td>
<td>Water</td>
</tr>
<tr>
<td></td>
<td>Other ration ingredients</td>
</tr>
<tr>
<td>Plan a feeding program for</td>
<td>B. Feeding materials</td>
</tr>
<tr>
<td>commercial flock, lambs, purebred flock and rams.</td>
<td>Roughages</td>
</tr>
<tr>
<td></td>
<td>Concentrates</td>
</tr>
<tr>
<td></td>
<td>Complete mixed rations</td>
</tr>
<tr>
<td></td>
<td>C. Making least cost rations</td>
</tr>
<tr>
<td></td>
<td>D. Parts to consider in feeding</td>
</tr>
<tr>
<td></td>
<td>Commercial Flock</td>
</tr>
<tr>
<td></td>
<td>during day period</td>
</tr>
<tr>
<td></td>
<td>during pregnancy</td>
</tr>
<tr>
<td></td>
<td>lactation</td>
</tr>
<tr>
<td></td>
<td>Lambs</td>
</tr>
<tr>
<td></td>
<td>early lambs</td>
</tr>
<tr>
<td></td>
<td>pasture period</td>
</tr>
<tr>
<td></td>
<td>dry lot fattening</td>
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<tr>
<td></td>
<td>complete roughage grain mixtures for fattening lambs</td>
</tr>
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<td></td>
<td>Purebred flock</td>
</tr>
<tr>
<td></td>
<td>as above for commercial but heavier</td>
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<tr>
<td></td>
<td>Rams</td>
</tr>
<tr>
<td></td>
<td>non-productive season</td>
</tr>
<tr>
<td></td>
<td>breeding season</td>
</tr>
</tbody>
</table>
### TEACHING METHODS

- **A.** Lecture - discussion of the requirements of sheep for nutrition.
- **B.** Chart-on-board-of-requirements from *Morrison's Feeds and Feeding Table #3* on various situations.
- **C.** Supervised readings from *Morrison, Cornell Bulletin #828* and *Sheep Science Chapter VII* using work sheet.
- **D.** Study of feed materials available on local market for feeding and prices.
- **E.** Make sample rations that reflect least cost and will meet requirements of the various classes needs.
- **F.** Field trip to farm flock to observe feeding practices being followed, equipment used and management techniques in use.
- **G.** Discussion of feeding program with operator.
- **H.** Discussion of feeding and management problems with different enterprise goals. (*Livestock Handbook for County Agents*) including the feeding of additives.
- **I.** For one type of enterprise (commercial flock, fat lamb, or Purebred flock) plan a complete feeding program for a year or cycle.

### STUDENT APPLICATION ACTIVITIES

- **A.** Note taking during a lecture and observation and notes on field trip.
- **B.** Work-sheet preparation.
- **C.** Making sample feed formula that meet requirements in various situations.
- **D.** Preparation of written report on enterprise feeding.

### EVALUATION PROCEDURES

- **A.** Oral or written test on nutritional needs and feeding materials.
- **B.** Teachers evaluation of feed formulation.
- **C.** Teachers evaluation of a feeding program and plan for one type of sheep enterprise.
### OBJECTIVES BY UNIT

**Unit 5 - Disease and Health**

**Objective #8**
Demonstrate a working knowledge of the cause, symptoms, treatment control and prevention measures for 10 diseases or conditions that affect sheep.

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Infectious Diseases</strong></td>
</tr>
<tr>
<td>- Sore mouth</td>
</tr>
<tr>
<td>- Scrapie</td>
</tr>
<tr>
<td>- Blue-tongue</td>
</tr>
<tr>
<td>- Eutrotoxemia</td>
</tr>
<tr>
<td>- Vibriosis</td>
</tr>
<tr>
<td><strong>B. Parasites</strong></td>
</tr>
<tr>
<td>- External</td>
</tr>
<tr>
<td><strong>C. Internal conditions</strong></td>
</tr>
<tr>
<td>- Bloat</td>
</tr>
</tbody>
</table>

**Objective #9**
Plan a disease and parasite control program for a sheep enterprise.

General Program should include:

A. Prevention measures from outside
   - Visitors
   - New stock
   - Fences

B. Prevention measures from within
   - Barns and runs
   - Pasture
   - Feed and water troughs
   - Exercise
   - Dog control
   - Vaccination
   - Flock separation
   - Isolation of infected animals
   - Parasite controls
     - internal
     - external
   - Disposal of dead animals
   - Other management practices
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study and group discussion of diseases.</td>
<td>A. Students compile notebook containing the work sheets.</td>
<td>Teacher evaluation of:</td>
</tr>
<tr>
<td>B. Use of disease information sheets to fill information as outlined in the objective.</td>
<td></td>
<td>A. Student notebook for content on each of the disease or condition studied.</td>
</tr>
<tr>
<td>C. Slides showing conditions.</td>
<td></td>
<td>B. Oral or written test where at least 80% accuracy is required for disease symptom, treatment and controls.</td>
</tr>
<tr>
<td>D. Charts and graphs of life cycles of parasites.</td>
<td></td>
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</tr>
<tr>
<td>E. Demonstration of determining temperature, respiration and pulse rate.</td>
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<td></td>
</tr>
<tr>
<td>F. References suggested include - 1956 Yearbook of Agriculture - Disease</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>A. Lecture - discussion of sanitation control program to be undertaken.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Field trip to farm flock or fat lamb situation to observe disease control and sanitation program.</td>
<td></td>
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<td></td>
<td>C. Discuss problem with operator or tape discussion and present in class.</td>
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<td></td>
<td>D. Tape interview with area veterinarian of correct disease control and sanitation measures to follow.</td>
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<tr>
<td></td>
<td>E. Chapter XI - Sheep Science as assigned reading.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discussion questions at end of chapter.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Notes taken on Program.</td>
<td>Teacher evaluation of:</td>
</tr>
<tr>
<td></td>
<td>B. Written answers to questions at end of Chapter XI - Sheep Science.</td>
<td>A. Written plan for prevention and control program, in a given situation.</td>
</tr>
<tr>
<td></td>
<td>C. Development of plan for control program.</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 6 - Record keeping</td>
<td>Area to include -</td>
</tr>
<tr>
<td>Objective #10</td>
<td>A. Those needed</td>
</tr>
<tr>
<td>Develop and maintain necessary</td>
<td>B. Useable form</td>
</tr>
<tr>
<td>records for a sheep enterprise.</td>
<td>C. Permanent Form</td>
</tr>
<tr>
<td></td>
<td>. Farm Flock Record</td>
</tr>
<tr>
<td></td>
<td>. Registration Papers for Purebred sheep</td>
</tr>
<tr>
<td></td>
<td>. Transfer Papers for Purebred sheep</td>
</tr>
<tr>
<td>Unit 7 - Housing requirements and equipment</td>
<td>A. Buildings</td>
</tr>
<tr>
<td>Objective #11</td>
<td>. Temperature</td>
</tr>
<tr>
<td>Develop a plan for housing and</td>
<td>. Humidity</td>
</tr>
<tr>
<td>pasturing a flock of sheep for</td>
<td>. Insulation and ventilation</td>
</tr>
<tr>
<td>a given situation.</td>
<td>. Light</td>
</tr>
<tr>
<td></td>
<td>. Water supply</td>
</tr>
<tr>
<td></td>
<td>. Heat supply - lambing</td>
</tr>
<tr>
<td></td>
<td>. Slotted floors</td>
</tr>
<tr>
<td></td>
<td>. Space requirements</td>
</tr>
<tr>
<td></td>
<td>. Manure disposal</td>
</tr>
<tr>
<td></td>
<td>B. Equipment</td>
</tr>
<tr>
<td></td>
<td>. Hay racks</td>
</tr>
<tr>
<td></td>
<td>. Grain troughs</td>
</tr>
<tr>
<td></td>
<td>. Self feeders</td>
</tr>
<tr>
<td></td>
<td>. Mineral feeders</td>
</tr>
<tr>
<td></td>
<td>. Watering facility</td>
</tr>
<tr>
<td></td>
<td>. Cutting chutes</td>
</tr>
<tr>
<td></td>
<td>. Dipping or spraying facility</td>
</tr>
<tr>
<td></td>
<td>. Lambing pens</td>
</tr>
<tr>
<td></td>
<td>. Lamb creep</td>
</tr>
<tr>
<td></td>
<td>. Shade</td>
</tr>
<tr>
<td></td>
<td>. Fences</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Review requirem</td>
<td>A. Problem solving for record</td>
<td>A. Oral or written test - problem of a given situation.</td>
</tr>
<tr>
<td>B. Using sample</td>
<td>keeping.</td>
<td></td>
</tr>
<tr>
<td>C. Borrow registra</td>
<td>B. Fill in sample registrations or transfer.</td>
<td></td>
</tr>
<tr>
<td>D. Supervised stu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Lecture - dis</td>
<td>A. Develop drawing of sheep handling facilities and housing made for farm flock.</td>
<td>A. Teacher evaluation of student plan for facility.</td>
</tr>
<tr>
<td>A. Develop drawing of sheep handling facilities and housing made for farm flock.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Supervised study Chapter X Sheep Science.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Field trip to farm flock situation for housing and equipment used.</td>
<td></td>
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</tr>
<tr>
<td>D. Trade magazines of farm plan of equipment used in sheep enterprises.</td>
<td></td>
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<tr>
<td>E. Develop a bill material for a facility or equipment item.</td>
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<th>166</th>
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<tbody>
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<td>15</td>
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</tbody>
</table>
# Objectives by Unit

<table>
<thead>
<tr>
<th>Unit 8 - Sheep management practices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective #12</strong></td>
</tr>
<tr>
<td>Assist in each of the following management techniques: castration, docking, tagging, foot trimming, dipping or spraying sheep.</td>
</tr>
</tbody>
</table>

| A. Jobs: |
| Docking |
| Castration |
| Tagging |
| Foot trimming |
| Dipping or spraying |

| B. Tools and equipment needed |
| C. Technique used |

<table>
<thead>
<tr>
<th>Unit 9 - Marketing products</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective #13</strong></td>
</tr>
<tr>
<td>Plan a marketing program for sheep under various situations and the marketing of the fleece.</td>
</tr>
</tbody>
</table>

| A. Slaughter and feeder lambs - Methods of marketing |
| Lamb pools |
| Auction markets |
| Terminal market at Buffalo |
| Other markets or buyers throughout state |
| Seasonal price trend |
| High market - May, June and July |
| Low market - October, November, and December |

| B. Hot house Lamb -  |
| Market |
| New York City |
| Large city market - Buffalo - Albany etc. |
| Price trends |
| Consistent market - December - May |
| Supply can break price |

| C. Purebred -  |
| Consignment sales |
| New York State Sheep Improvement Project |
| Ithaca - July |
| New England Sheepbreeders |
| Northampton, Mass. |
| Keystone Stud Ram sale |
| Harrisburg, Penns. |

| D. Wool Markets |
| Wool grower cooperative |
| Wayland, Albion, Auburn, New Berlin, Schaghticoke, Altamont. |

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion of handling animals vs. review.</td>
<td>A. Observation and assistance in the handling of animals for the demonstration.</td>
<td>A. Teacher evaluation of: Student participation in assisting and handling.</td>
</tr>
<tr>
<td>B. Demonstration of each of the management techniques by the owner of a farm flock.</td>
<td></td>
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</tr>
<tr>
<td>C. Supervised study assigned reading Chapter VIII - Sheep Science on management techniques.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Notes taken on lecture and on field trips.</td>
<td>Teacher Evaluation of:</td>
</tr>
<tr>
<td></td>
<td>B. Graph construction of market conditions.</td>
<td>A. Graph preparation and analysis of market conditions.</td>
</tr>
<tr>
<td></td>
<td>C. Prepare a short report on the marketing of lambs or ewes as outlined in text. OR</td>
<td>B. Prepared report - either oral and written or written.</td>
</tr>
<tr>
<td></td>
<td>D. A short report on marketing procedure for fleece as outlined in the text.</td>
<td>C. Group written report on situation assigned.</td>
</tr>
<tr>
<td>A. Lecture-discussion of marketing methods as applied in New York in location of various types of markets available.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Using the livestock market report from the &quot;Buffalo Evening News&quot; have students plot the market numbers and prices over a period of time (Preferably on a using Market) making either bar or line graphs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Supervised study of Chapter XII - Sheep Science Dealing with market classes and grade for sheep and marketing patterns.</td>
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<tr>
<td>D. Attend a sheep sale either at a livestock market as Caldonia or watch sales at the terminal market in Buffalo.</td>
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<tr>
<td>E. Contact the buyer for a packing plant for a possible guest speaker in class or a tape interview on the topic of requirements for top quality animals.</td>
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<tr>
<td>F. Discuss with local farmer his marketing procedure for lambs, ewes for slaughter.</td>
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<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
<td>EVALUATION PROCEDURES</td>
</tr>
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<td>--------------------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>G. Lecture - discussion of characteristics of fleece and what is considered to be a quality fleece.</td>
<td>(Same as on previous sheet)</td>
<td>(Same as on previous sheet)</td>
</tr>
<tr>
<td>H. Lecture - discussion of the steps in preparing the fleece for sale.</td>
<td></td>
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</tr>
<tr>
<td>I. Supervised study Chapter XI/I - Sheep Science. Dealing with fleece characteristics and quality fleece.</td>
<td></td>
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</tr>
<tr>
<td>J. Movie or slide film of shearing sheep or demonstration of shearing.</td>
<td></td>
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</tr>
<tr>
<td>K. Guest speaker from the wool marketing cooperative in the area on handling of fleece and the grading storage and sale of the fleece.</td>
<td></td>
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</tr>
<tr>
<td>L. Divide class into groups for preparation of a plan for marketing sheep under a situation assigned.</td>
<td></td>
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</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - SHEEP PRODUCTION

RESOURCE MATERIALS

   Feeds and Feeding, F.B. Morrison, Morrison Publishing Co., Ithaca, N.Y.
   Livestock Handbook for County Agents.

   *In the module - The term "Sheep Science" is used for "Sheep and Wool Science"

B. Bulletins - Cornell Extension Bulletin #E828 Sheep Production.

C. Periodicals - Hoards Dairyman - Fort Atkinson, Wisconsin.

D. Audiovisuals - None
<table>
<thead>
<tr>
<th>EWE</th>
<th>Birth Date</th>
<th>Wool</th>
<th>Regis. or Grade</th>
<th>LAMB</th>
<th>Birth Date</th>
<th>Bi.</th>
<th>Sex</th>
<th>Sire No.</th>
<th>Mean Date</th>
<th>Wean Wt.</th>
<th>Wean Gr.</th>
<th>Multi. Abnormality Code</th>
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**BREEDING:**

Owner Name: ___________________________ Address: ___________________________

Flock No: ___________________________ Flock Size: ___________________________

Year of Report: ___________________________ Creep Code: ___________________________

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**LIVESTOCK HANDBOOK FOR AGENTS**

Livestock Commodity Committee

SECTION II, B-5
TITLE - POULTRY PRODUCTION

DESCRIPTION:

This module will include an overview and general study of modern poultry housing, equipment and facilities, sanitation and health programs, feeding requirements for chicks, pullets, layers, and the marketing of eggs and poultry products. In depth information may be studied by referring to modules in Poultry Selection, Poultry Facilities, Poultry Health and Marketing and Poultry Management.

MAJOR DIVISIONS OR UNITE OF CONTENT.

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
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</thead>
<tbody>
<tr>
<td>1. The poultry industry</td>
<td>Class: 1, Other: 1</td>
</tr>
<tr>
<td>2. Selecting poultry breeds and strains</td>
<td>Class: 2, Other: 3</td>
</tr>
<tr>
<td>3. Housing facilities</td>
<td>Class: 3, Other: 3</td>
</tr>
<tr>
<td>4. Sanitation and health</td>
<td>Class: 3, Other: 3</td>
</tr>
<tr>
<td>5. Feeding programs</td>
<td>Class: 3, Other: 1</td>
</tr>
<tr>
<td>6. Poultry marketing</td>
<td>Class: 2, Other: 3</td>
</tr>
<tr>
<td>7. Management of a poultry enterprise</td>
<td>Class: 1/15, Other: 1/15</td>
</tr>
</tbody>
</table>

Revised August 1975
MODULE OF INSTRUCTION

Title - POULTRY PRODUCTION

OBJECTIVES to be obtained:

The student will be able to:

1. Investigate the economic importance of the poultry industry and the types of poultry enterprises.

2. Select a breed or strain of poultry for a given type of operation and list six factors involved in making the selection.

3. Plan facilities for a given poultry enterprise.

4. Prepare a list of 25 poultry diseases and demonstrate a working knowledge of ten diseases, listing causal agents, symptoms, post mortem examination results, treatment and prevention.

5. Plan a disease prevention and sanitation program for a given poultry enterprise.

6. Plan a feeding program for a given type of poultry enterprise.

7. Determine and list the marketing outlets for eggs available to him in his local area and select the one most suited to his own needs.

8. Plan a program for marketing birds for a given situation.

9. Develop a program of keeping necessary poultry records.

10. Determine the profitableness of a poultry enterprise through record analysis.
**Title** - POULTRY PRODUCTION

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td><strong>Unit 1. The Poultry Industry</strong></td>
<td><strong>A. Present economic statistics</strong></td>
</tr>
<tr>
<td><strong>Objective 1</strong></td>
<td>. New York State</td>
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<td></td>
<td>. Local county or-area</td>
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<td>. Regional data</td>
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<td></td>
<td><strong>B. Table eggs</strong></td>
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<td></td>
<td><strong>C. Hatching eggs and breeder farms</strong></td>
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<tr>
<td></td>
<td><strong>D. Hatcheries</strong></td>
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<tr>
<td></td>
<td><strong>E. Meat bird production</strong></td>
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<td><strong>F. Broiler production</strong></td>
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<td></td>
<td><strong>G. Ducks</strong></td>
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<td><strong>H. Turkeys</strong></td>
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<td></td>
<td><strong>I. Pheasants and game birds</strong></td>
</tr>
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<td></td>
<td><strong>J. Employment opportunity</strong></td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
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<tr>
<td>-------------------</td>
<td>-------------------------------</td>
</tr>
</tbody>
</table>
| A. Lecture and discussion  
Use overhead projector. Make overlays to present data from the current "Agricultural Situation and Outlook Handbook," Cornell University for poultry in New York State. | A. Notes based on discussion of the industry and opportunities  
B. Identification of job possibilities in the industry.  
C. Prepare a brief written report analyzing the poultry industry in terms of the economic data. | A. Teachers evaluation of written report on interpretation of poultry data. |
| B. Field trips to local or regional poultry farms and hatcheries to see conventional and environmental controlled housing. | | |
| C. Resource person--have outstanding poultryman to talk to students in class or at his place of business on opportunities in the poultry business or tape interview used in class. | | |
| D. Discussion  
Opportunities for employment in poultry will be identified. | | |
**Unit 2. Selecting Poultry Breeds and Strains**

**Objective 2**
Select a breed or strain of poultry for a given type of operation listing 6 factors involved in making the selection.

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **A. Table egg production** | White leghorns  
Rhode Island reds  
Hybrids, two, three and four way crosses  
Barred rocks  
New Hampshires  
Sex-linked |
| **B. Meat Production** | Production crosses  
White rocks  
Silver crosses |
| **C. Factors involved in selection of breed or strain** | Livability  
Rate of production  
Persistency of production  
Feed conversion  
Body size-salvage value  
Egg size, shell texture, color and shape  
Interior egg quality  
Freedom from broodiness  
Rate of maturity  
Rate of feathering  
Availability of stock nearby |
| **D. Economic outlook to selection** | Compare table egg production with meat bird production. Discuss:  
Housing  
Feed efficiency  
Nature of enterprises  
Equipment  
Potential profits |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and discussion using slides and/or photographs or film strip of the</td>
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<tr>
<td>various breeds and varieties showing characteristics of the birds. Show DeKalb</td>
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<tr>
<td>film strip on genetic factors and breeding points.</td>
<td>A. Preparation of chart of breed characteristics. Students make a chart showing the outstanding</td>
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<td></td>
<td>characteristics of the breeds and/or varieties.</td>
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<tr>
<td>B. Discussion and supervised study using trade literature, texts and bulletins.</td>
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<tr>
<td>Students develop a list of factors to consider in selecting a breed or strain for</td>
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<tr>
<td>both table egg and meat production.</td>
<td>B. Development of list of factors necessary to use in selection of strain or breed.</td>
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<td>C. Discussion on possible sources of birds using trade literature-advertisements.</td>
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<td></td>
<td>C. Students evaluate random sample flock tests and official egg laying contests reports and</td>
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<td>record of performance reports using magazines.</td>
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<tr>
<td>D. Supervised study. Interpret data regarding feed conversion, egg production,</td>
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<td>livability, body size, salvage value, egg size and color shell texture and shape,</td>
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<td>freedom from broodiness, rate of feathering and maturity.</td>
<td>D. Evaluate literature and reports for high production and conformation trait associated with</td>
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<td></td>
<td>meat production.</td>
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<td>E. Lecture and discussion of enterprise choice to selection in terms of possible</td>
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<td>returns.</td>
<td>E. Determine profitability of the egg production vs meat production for the local area.</td>
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<td>F. Preparation of a report on selecting enterprise to follow and strain of birds to raise</td>
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<td>reflecting the enterprise situation.</td>
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<td>OBJECTIVES BY UNIT</td>
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<tr>
<td>Unit 3 - Housing Facilities</td>
<td>Determining housing requirement</td>
<td></td>
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<tr>
<td>Objective 3</td>
<td>A. Enterprise</td>
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<tr>
<td>Plan facilities for a given poultry enterprise</td>
<td>. Broiler-roaster production</td>
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<td></td>
<td>. Laying flock-floor</td>
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<td>. Laying flock-cages</td>
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<td>B. Structures</td>
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<td></td>
<td>. Broiler colony house</td>
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<td>. Multiple unit</td>
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<td>. Multiple story</td>
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<td>. site selection and location</td>
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<td>. type of construction</td>
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<td>. width-length-ceiling height</td>
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<td>. insulation-wallsceilings-vapor barrier</td>
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<td>. ventilation-controlled environment</td>
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<td>. heating-wiring-plumbing</td>
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<td>. utility room</td>
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<td>. floors-doors</td>
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<td>. emergency electrical service</td>
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<td>. water supply</td>
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<td>. manure and litter disposal</td>
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<td>C. Equipment</td>
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<td>. Nutritional</td>
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<td>. brooders</td>
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<td>. feeders-grain handling</td>
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<td>. waterers</td>
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<td>. roots (if used)</td>
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<td>. Layer</td>
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<td>. nesting equipment (if used)</td>
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<td>. egg gathering equipment</td>
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<td>. egg room equipment</td>
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<td>. cages-type-capacity-system</td>
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<td>. broiler-roaster handling equipment</td>
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<td>. loading dock</td>
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<td>. cleaning equipment</td>
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<td>. manure handling equipment</td>
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<td>. disposal of dead birds</td>
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<td>. sanitation equipment</td>
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<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and discussion and supervised study using bulletin literature covering the requirements of each of the three enterprise systems.</td>
<td>A. Students procure from suppliers, building materials and plans. Hardware companies and local lumberyards are good sources for literature and samples of materials.</td>
<td>A. Oral or written test</td>
</tr>
<tr>
<td>B. Guest speakers to the class as a panel of a representative of equipment supplier, extension specialist, egg producer, meat producer and a contractor to speak on their experiences and suggestions and recommendations for structures and equipment.</td>
<td>B. Have students determine approximate costs for items of equipment and cost of construction of buildings and develop plan for poultry housing.</td>
<td>B. Teacher evaluation of plan for poultry housing to meet requirements for a given type of situation.</td>
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<tr>
<td>C. Use of taped interviews together with slides taken at the operations.</td>
<td>C. Preparation of floor plans.</td>
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<tr>
<td>D. Field trip to several producers to observe their physical set up and discuss with the operator the system, operation, desirable features and features to be changed.</td>
<td>D. Model construction.</td>
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<tr>
<td>E. Films and discussion. Available through equipment companies.</td>
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<tr>
<td>F. Use floor plans for discussion purposes. Both those available from Cornell and Hoards Dairyman and commercial firms.</td>
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</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 4. Sanitation and health program.</td>
<td>Basic materials to be included</td>
</tr>
<tr>
<td>Objective 4</td>
<td>A. Vocabulary of terms associated with disease and health</td>
</tr>
<tr>
<td>Prepare a list of 25 poultry diseases and demonstrate</td>
<td>B. Study of anatomy of the various species</td>
</tr>
<tr>
<td>a working knowledge of 10 diseases and conditions</td>
<td>C. Post mortem of birds</td>
</tr>
<tr>
<td>listing causal agents, symptoms, P.M.E. treatment and</td>
<td>D. Diseases of Poultry</td>
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<tr>
<td>prevention.</td>
<td>. Non Nutritional Diseases to Include</td>
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<td>. blue comb</td>
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<td>. bronchitis</td>
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<td>. epidemic tremor</td>
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<td>. lewkos is</td>
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<td>. new castle</td>
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<td>. fowl pox</td>
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<td>. pullorium</td>
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<td>. Nutritional Diseases-deficiency</td>
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<td>. cannibalism</td>
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<td>. cage fatigue</td>
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<td>. fatty liver syndrome</td>
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<td>. aplastic anemia</td>
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<td>. Internal Parasite</td>
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<td>. coccidiosis</td>
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<td>. worms</td>
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<td>. External Parasites</td>
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<td>. lice</td>
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<td>. mites</td>
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<td>. Other ailments or health problems</td>
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<tr>
<td>Objective 5</td>
<td>A. Prevention of diseases</td>
</tr>
<tr>
<td>Plan a disease prevention and sanitation program for</td>
<td>. Sanitation-disinfecting-fumigation</td>
</tr>
<tr>
<td>a poultry enterprise.</td>
<td>. Vaccination program for specific disease</td>
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<td>. Antibiotic administration</td>
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<td>. Disposal of dead birds</td>
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<td>. Manure &amp; litter disposal</td>
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<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
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<tr>
<td>---------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Prepare a list of health items—page 150, Poultry Science, for students to copy and understand through supervised study.</td>
<td>A. Preparation of word identifications.</td>
</tr>
<tr>
<td>B. Use of Nasco overlay—overhead projections-Ditto sheets for labeling by students.</td>
<td>B. Labeling of proposed sheets.</td>
</tr>
<tr>
<td>C. Dissection demonstration of birds.</td>
<td>C. Student assistance in making the P.M.E. or if enough birds available organize teams for the P.M.E.</td>
</tr>
<tr>
<td>D. Demonstrate the proper technique for making a chicken post mortem.</td>
<td>D. Debeaking, Physical examination of birds for parasites.</td>
</tr>
<tr>
<td>E. Supervised study—Film strip &quot;How to do a Poultry Autopsy&quot; VEP Beacon Profitable Poultry Mgt.</td>
<td>E. Preparation of work sheets on individual diseases.</td>
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<tr>
<td>F. Demonstration of debeaking and have student participation.</td>
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<tr>
<td>G. Supervised study and individual instruction in preparation of work sheets for diseases as outlined in the objective.</td>
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<tr>
<td>H. Field trip to State diagnostic lab closest to school to discuss with veterinarian the more common diseases.</td>
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<tr>
<td>I. Field trip to local poultry situation to discuss disease problems with operator.</td>
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<td>J. Guest speaker (or tape) of local veterinarian on disease control and prevention.</td>
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<td>K. Color slides of various diseases as to symptoms and P.M.E.</td>
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<tr>
<td>A. Field trip to local poultry situation to discuss sanitation measures, Examination of equipment.</td>
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<tr>
<td>B. Discussion with veterinarian of disease prevention program.</td>
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<td>C. Vaccination demonstration and student participation.</td>
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<tr>
<td>D. Independent study and assistance to prepare a written plan for poultry sanitation and disease control.</td>
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</tbody>
</table>

*P.M.E. = Post Mortem Examination*
<table>
<thead>
<tr>
<th>Unit 5. Feeding Programs</th>
<th>Objective 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plan a feeding program for a given type of poultry enterprise</td>
<td></td>
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</tbody>
</table>

**CONTENT**

- **A. Check starters**
  - High energy feeds
  - Mash, crumbles, pellets
  - Medications

- **B. Growing feeds**
  - All mash grower
  - Grower with hand grains
  - Controlled feeding system
  - High energy feeds

- **C. Laying rations**
  - Complete feeds
    - Conventional
    - High energy
    - Laying mash and hard grains
  - Mash, crumbles, pellets

- **D. Protein, mineral and vitamin requirements**

- **E. Purchased feeds**
  - Types
    - Special feeds

- **F. Home mixed feeds**
  - Premixes, concentrates
  - Hard grains
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
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<tbody>
<tr>
<td>A. Display the various ingredients that are used to formulate feeds. Supervised study for identification.</td>
<td>A. Work out lab unit on purchasing commercial feeds vs home mixed feeds using local grains and concentrates.</td>
<td>A. Teacher evaluation of prepared planned feeding program for a given type of poultry enterprise.</td>
</tr>
<tr>
<td>B. Show students samples of poultry feeds.</td>
<td>B. Group planning and preparation of the report.</td>
<td>B. Teacher evaluation of determining costs of feeding birds in given situations using local feed prices and ingredient prices.</td>
</tr>
<tr>
<td>C. Collect the tags from the poultry feeds available. Have students check the fiber, fat, and protein on the tags.</td>
<td>C. Study the ingredients listed on the feed tags.</td>
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<tr>
<td>D. Field trips. If possible visit a feed manufacturing plant and observe the feed being made.</td>
<td>D. Select rations that meet the nutritional requirement of the birds.</td>
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<tr>
<td>E. Classroom discussion and board work on feed formulation and nutritional requirement.</td>
<td>E. Develop economical feeding program.</td>
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<tr>
<td>F. Supervised study. Choose the types of feeds that best meet the needs of the various age groups of birds.</td>
<td>F. Recognize out of condition feeds.</td>
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<tr>
<td>G. Resource person. Talk with representative of feed company dealing with complete feeding program.</td>
<td></td>
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</tr>
<tr>
<td>H. Supervised practice. Divide class into groups to plan a feeding program for a given situation.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Unit 6: Poultry Marketing

#### Objective 7
Determine and list the marketing outlets for eggs available to him in his local area and select the one most suited to his own needs.

#### Objective 8
Plan a program for marketing birds for a given situation

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Producing high quality eggs</td>
</tr>
<tr>
<td>B. Market service agreements</td>
</tr>
<tr>
<td>C. Types of markets</td>
</tr>
<tr>
<td>1. Local</td>
</tr>
<tr>
<td>2. Contract agreements</td>
</tr>
<tr>
<td>3. Cooperatives</td>
</tr>
<tr>
<td>D. Egg marketing problems</td>
</tr>
<tr>
<td>E. Egg price factors</td>
</tr>
<tr>
<td>F. Egg grading, packaging and handling</td>
</tr>
<tr>
<td>G. Maintaining good egg quality</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Situations to consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laying flock</td>
</tr>
<tr>
<td>Culling birds</td>
</tr>
<tr>
<td>Mass disposal</td>
</tr>
<tr>
<td>Meat production</td>
</tr>
<tr>
<td>Game bird</td>
</tr>
<tr>
<td>Broiler-fryer</td>
</tr>
<tr>
<td>Roaster</td>
</tr>
<tr>
<td>Capon</td>
</tr>
<tr>
<td>Market</td>
</tr>
<tr>
<td>Seasonal</td>
</tr>
<tr>
<td>Holiday situation</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td>A. Lecture, Overhead projector, study the parts of the egg and identify the characteristics of grade A eggs.</td>
</tr>
<tr>
<td>B. Supervised study of U.S. standards for shell eggs (Tubb p 248, <em>Poultry Science</em>) and weight classes for shell eggs.</td>
</tr>
<tr>
<td>C. Film strip &quot;Grading Eggs for Quality&quot;-VED. Discussion.</td>
</tr>
<tr>
<td>D. Have an egg dealer speak to the class in school or at his place of business on markets and discuss egg marketing agreements.</td>
</tr>
<tr>
<td>F. Demonstrate how to candle and grade eggs. Use Cornell Bull, followed by student practice.</td>
</tr>
<tr>
<td>G. Field trip to refrigerated egg room and egg grading equipment for both wholesale and retail trade.</td>
</tr>
</tbody>
</table>

<p>| A. Lecture and discussion of disposal of birds. | A. Cull or keep practice and egg production estimation. | A. Teacher evaluation of ability to determine egg production for cull or keep. Select a market for disposal of birds as a written plan. |
| B. Visit to poultry operations both egg and meat production situations and discuss with operator the program used to dispose of birds. | B. Preparation of a written plan of one method for marketing birds. | B. Teacher's evaluation of this written plan. |
| C. Discuss problem with local processing plant operation as to his operational and tour facilities. | C. Study of market information for supply and demand. | |
| D. Discuss with operators marketing agreements for birds. | | |
| E. Demonstrate culling procedure and estimation of egg production of individual birds. NASCO film strip on culling poultry. | | |
| F. Supervised practice in cull or keep of birds. | | |</p>
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 7. Management of a Poultry Enterprise</td>
<td></td>
</tr>
<tr>
<td>Objective 9</td>
<td>A. Those needed</td>
</tr>
<tr>
<td></td>
<td>B. Useful forms</td>
</tr>
<tr>
<td></td>
<td>C. Permanent and temporary</td>
</tr>
<tr>
<td></td>
<td>- Inventory</td>
</tr>
<tr>
<td></td>
<td>- Cash account</td>
</tr>
<tr>
<td></td>
<td>- Production records</td>
</tr>
<tr>
<td></td>
<td>- Mortality and health</td>
</tr>
<tr>
<td></td>
<td>- Feed intake</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objective 10</th>
<th>Ability to determine the profitableness of a poultry enterprise through record analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Summary of data from records</td>
<td></td>
</tr>
<tr>
<td>&quot;Chicken Arithmetic&quot;</td>
<td></td>
</tr>
<tr>
<td>B. Farm Business chart for poultry</td>
<td></td>
</tr>
<tr>
<td>C. Comparison by enterprises</td>
<td></td>
</tr>
<tr>
<td>- Cost per pullet</td>
<td></td>
</tr>
<tr>
<td>- Cost to produce a dozen eggs</td>
<td></td>
</tr>
<tr>
<td>- Feed costs</td>
<td></td>
</tr>
<tr>
<td>- Labor and machinery costs</td>
<td></td>
</tr>
<tr>
<td>- Chicken arithmetic</td>
<td></td>
</tr>
</tbody>
</table>

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16
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
</table>
| A. Lecture and discussion of the various types of records needed and the kinds of recordkeeping books available for the operation and flock(s). | A. Examination of poultry records kept by various poultry operators.  
B. Develop a set of poultry records for a given situation. | A. Teacher evaluation of the records. |
| B. Supervised study. Students examination of various records available from poultry magazines and feed companies. | | |
| A. Lecture and discussion using data from a poultry producer. Show the source of data pulled together for analysis.  
B. Supervised study-Farm Management Handbook. Determine cost factors and mechanics of calculations.  
C. Supervised study. Problem sheets for practice.  
D. Supervised study. Preparation of farm business charts. | A. Preparation of Farm Business charts.  
B. Study farm business analysis information, county records from extension, keeping clubs and evaluate a poultry operation.  
C. Prepare a farm business problem similar to that of those used at Cornell Farm and Home Week in the early 1960's of a poultry problem together with several alternatives for students to make best plan. | A. Oral or written test.  
- Chicken arithmetic  
- Farm Business chart  
- Analysis of poultry business  
B. Teacher evaluation of farm business problem solution. |
Title - POULTRY PRODUCTION

RESOURCE MATERIALS

Books:
- Poultry Science - M.E. Ensminger - Interstate Publisher - Danville - Ill.
- Veterinary Guide for Farmers - G.W. Stamm - Hawthorn Publisher - N.Y. N.Y.
- Disease and Parasites of Poultry - Edgar Hugh Barger & Leslie Elsworth Card - Lea & Febiger - Philadelphia
- Profitable Poultry Management - Staff - Deacon Milling Company

Bulletins:
- Cornell Extension Bulletins - #E1140 Ventilation for Poultry Houses
- #E1145 Emergency Warning System for Poultry Houses
- # S82 Egg Processing Plants for Farms
- #E1195 Economics Poultry Manual Disposal
- #E1062 Raising Replacement Pullets in New York
- #E 887 Culling for Egg Production

Periodicals:

Audiovisuals:
- VEP Slide film Poultry Selection and Judging
- Dekalb Filmstrip Poultry Genetics - Breeds
- VEP How to Do a Poultry Autopsy
- NASCO Poultry Supplies - egg candlers, egg grader, debeaker, incubators, brooders, lamps, cages, leg bands, poultry knives

Vocational Education Productions - Film strips,
- The Poultry Industry, Embryo Development of the Chick, Grading Eggs for Quality, Poultry Autopsy, Poultry Brooding Management, Poultry Selection and Judging
MODULE OF INSTRUCTION

Title - SELECTING AND HANDLING DOGS AND CATS

DESCRIPTION:

In this module students will learn the breeding standards, purpose and conformation knowledge to choose quality animals. The student will know the basic standards of each group and breed of domestic dogs and cats. With this knowledge, the proper combination of animals may be chosen for breeding.

The methods of properly restraining dogs and cats of all sizes and temperament, by hand and with restraining devices will be practiced. The advantages and disadvantages of medication for restraint will be observed. Methods of capturing loose animals quickly and safely will also be an important consideration.

The student will develop confidence, patience and firmness in handling all animals and be able to remove and return them to their cages.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Breed standard of cats and dogs</td>
<td>6</td>
</tr>
<tr>
<td>2. Safety and proper handling of cats and dogs</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

Revised June, 1974
MODULE OF INSTRUCTION

Title - SELECTING AND HANDLING DOGS AND CATS

OBJECTIVES to be obtained:

The student will be able to:

1. Using the published breed standards, consistently select the top animal from a group of three dogs or cats, using the published breed standards.
2. Identify 15 breeds of cats by length and color of hair and eye color.
3. List 6 major categories of dogs and give the major purpose of each.
4. List 3 breeds of dogs in each major category and state 5 outstanding features of each.
5. Properly restrain cats and dogs of all sizes and temperaments by head and restraining devices.
6. Explain the proper use of medicinal restraints and reactions to medication used for restraining dogs and cats.
7. Develop confidence, patience and firmness in capturing loose animals and in removing and returning animals to cages safely.

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# Objectives by Unit

## Unit 1 - Breed Standard of Cats and Dogs

<table>
<thead>
<tr>
<th>Objective #1</th>
<th>Consistently select the top animal from a group of 3 dogs or cats, using the published breed standards.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Objective #2</th>
<th>Identify 15 breeds of cats by length and color of hair and eye color.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Objective #3</th>
<th>List 6 major groups of dogs and give the major purpose of each:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Objective #4</th>
<th>List 3 breeds of dogs in each major category of dogs and cats and state the 5 outstanding features of each.</th>
</tr>
</thead>
</table>

## Content

<table>
<thead>
<tr>
<th>A. Type</th>
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<tbody>
<tr>
<td>B. Conformation</td>
</tr>
</tbody>
</table>

### A. Various breeds of domestic cats

- Long-haired breeds
- Short-haired breeds
- Approved eye colors

### A. Various breeds of dogs

- Sporting breeds
- Working breeds
  - herding
  - guard dogs
  - sled dogs
- Terrier breeds
- Hound breeds
- Toy breeds
- Nonsporting breeds

### A. Categories outlined same as above

---

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Text - AKC - Complete Book of Dogs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Lecture - discussion</td>
<td>A. Students will do supervised study on breeds of dogs and cats of their interest.</td>
<td>A. Lab - oral testing. Use judging score cards and give reasons for animal placement.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Note taking</td>
<td></td>
</tr>
<tr>
<td>C. Text</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A. Demonstration and discussion of cat and dog breed standards and purpose. (Using live samples).</strong></td>
<td>A. Judge animals of the same breed as to the breed standards.</td>
<td>A. Oral or written identification of 15 breeds of cats by length and color of hair and eye color.</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A. Lecture</strong></td>
<td>A. Care for and breed pure bred animals.</td>
<td>A. Written or oral test relating each major group of dogs to a purpose.</td>
</tr>
<tr>
<td>B. Breeding and selling of pure bred animals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Class discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Field trip to breeding kennel.</td>
<td></td>
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<tr>
<td>E. Speaker</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>A. Supervised study</strong></td>
<td>A. Compile notes</td>
<td>A. Teacher evaluation of student's list</td>
</tr>
<tr>
<td>B. Field trip to breeders, and dog and cat shows.</td>
<td>B. Prepare questions for field trip.</td>
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</tbody>
</table>
Objective #5
Properly restrain cats and dogs of all sizes and temperament by hand and restraining devices.

Objective #6
Explain the proper use and reaction to medications used for restraining dogs and cats.

Objective #7
Develop confidence, patience and firmness in
- Capturing loose dogs and cats
- Removing and returning dogs and cats to cages

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Unit 2 - Safety and proper handling of cats and dogs | A. Cats
  - Hand restraining
  - Restraining devices
  - Discussion of medication for restraining
B. Dogs
  - Hand restraining
  - Restraining devices |
| Objective #6 | A. Use of medication for restraining
  - Approach
  - Injection
  - Time |
| Objective #7 | A. Removal and returning of dogs and cats to cages
  - Methods
  - Safety |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
</table>
| **Text: I.A.T. Manual**  
**U.F.A.W. Handbook**  
**Film A.**  
A. Demonstration of the restraint of dogs and cats by  
. Hand  
. Restraining devices  

|               | A. Students will practice items demonstrated by instructor.  
B. Judge each other on their restraining techniques. |
|---------------|------------------------------------------------------------------|
| **A. Class discussion**  
**B. Demonstration by veterinarian of the use of medications for restraint of dogs and cats.** |
|               | A. Observe a veterinarian as he properly uses several forms of medication for restraining.  
B. Record the reactions noticed in the animal. |
| **A. Class discussion**  
**B. Teacher demonstration in the proper methods of:**  
. Capturing loose dogs and cats  
. Removing and returning dogs and cats to cages. |
|               | A. The student will daily:  
. Properly remove and return all animals as caging is cleaned.  
. Properly capture loose dogs and cats. |
|               | A. Oral or written test:  
. List the symptoms to be expected in medicating cats and dogs in restraining with 75% accuracy. |
|               | A. Teacher's evaluation of student's ability to:  
. Capture 2 loose cats and 2 dogs  
. Remove and return 3 dogs and 3 cats to their cages. |

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Title - SELECTING AND HANDLING DOGS AND CATS

RESOURCE MATERIALS

Books
A. The UFAW Handbook
Care and Management of Laboratory Animals
Edited by staff of UFAW, 3d edition - E. & S. Livingstone LTD, England $22.00

B. The I.A.T. Manual of Laboratory Animal Practice and Techniques
D. J. Short & D. P. Woodnott, 2d edition, Charles C. Thomas, Springfield, Ill, $14.00

C. The Complete Book of Dog Care
Leon F. Whitney, Doubleday & Company, Garden City, New York

D. Manual for Laboratory Animal Technicians
Publication 67-3, American Association for Animal Science, Joliet, Ill. $3.00

E. The A.K.C. Complete Book of Dogs
American Kennel Club, 50 Madison Avenue, New York, N. Y. $6.00

Periodicals -
A. Laboratory Animal Digest, Ralston Purina Co., St. Louis, Missouri

B. Dog Research, Gaines Dog Research Center, 250 Park Avenue, New York, New York

C. Laboratory Animal Care, American Association of Laboratory Animal Science, Box 10, Joliet, Ill.

Audiovisuals -
Films
A. Handling Laboratory Animals, American Association for Laboratory Animal Science, Joliet, Ill.

B. Safe Handling of Laboratory Animals, National Medical Audiovisual Center, Chamblee, Georgia

C. Laboratory Dogs, National Medical Audiovisual Center, Chamblee, Georgia
Title - Basic Dog Grooming

DESCRIPTION:

The student will be involved in orientation to dog grooming activities. This will include practicing grooming styles, and cleaning and maintaining the grooming shop. Knowledge and use of grooming tools will be stressed. Students will develop basic skills in use, maintenance and function of this equipment. Time will also be devoted to ordering proper equipment.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocations</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Orientation to basic dog grooming</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>2. Equipment needed for dog grooming</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3. Function and proper use of equipment</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>4. Care and maintenance of equipment</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>5. Purchasing of equipment</td>
<td>1/5</td>
<td>2/25</td>
</tr>
</tbody>
</table>

Revised June 1975
OBJECTIVES to be obtained:

The student will be able to:

1. List major responsibilities of a dog groomer.
2. Identify and list grooming tools as listed by the instructor.
3. Demonstrate the function and the proper use of all equipment needed in dog grooming.
4. Demonstrate care and maintenance of dog grooming equipment.
5. List and order equipment identified for quality and usability for grooming.
**OBJECTIVES BY UNIT**

<table>
<thead>
<tr>
<th>Unit 1 - Orientation to basic dog grooming</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #1</td>
<td>A. List responsibilities of groomers</td>
</tr>
<tr>
<td></td>
<td>B. Types of working conditions in shops</td>
</tr>
<tr>
<td></td>
<td>C. Procedures in animal handling and care while in for grooming</td>
</tr>
<tr>
<td></td>
<td>D. Cleaning and care of grooming shop</td>
</tr>
<tr>
<td></td>
<td>E. Students will handle various dogs</td>
</tr>
<tr>
<td></td>
<td>F. Identify all various hair cutting styles on different breeds</td>
</tr>
</tbody>
</table>

**Unit 2 - Equipment needed for dog grooming**

| Objective #2                              | A. List of equipment for dog grooming: |
|                                          | . Clippers (Oster A5 and A2) |
|                                          | . Blades (all types) |
|                                          | . Scissors (all types) |
|                                          | . Thinning shears (single edge - double edge) |
|                                          | . Brushes (slicker wire brush, pin, and bristle) |
|                                          | . Combs (coarse, medium, fine) |
|                                          | . Rakes, mat splitters (oliver mat & tangle splitter) |
|                                          | . Nail tools (scissor type, guillotine type) |
|                                          | . Nail file |
|                                          | . Grooming table (restraining equipment) |
|                                          | . Dryers (cage, floor, hand types) |
|                                          | . Ear cleaning tools (needle holder, forceps) |
|                                          | . Stripping comb |

**B. Special Safety Equipment:**

|                                          | . Lube spray (Oster) |
|                                          | . Silver nitrate sticks (nail bleeding) |
|                                          | . Ointment (Desitin oint.) |
|                                          | . Styptic powder & stick (cuts, minor) |
|                                          | . Ear oil, powder |
|                                          | . Medicated powder |
|                                          | . Optical ointment |

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Teacher demonstration using live animals and grooming charts (clipping styles all breeds)</td>
<td>A. Work in lab with various dogs.</td>
<td>A. Oral or written test on grooming styles and shop responsibilities.</td>
</tr>
<tr>
<td>B. Field trip to grooming shops (local)</td>
<td>B. Use of disinfectants and cleaners in shop areas.</td>
<td></td>
</tr>
<tr>
<td>D. Field trip (local) dog shows (when available)</td>
<td>C. Set up a shop and arrange professionally.</td>
<td></td>
</tr>
<tr>
<td>Texts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Grooming&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(by Shirlee A. Kalstone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;Clipping Poodle&quot;</td>
<td></td>
<td></td>
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<tr>
<td>(by Pearl Stone)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guest speakers - shop owners, managers, handlers</td>
<td></td>
<td></td>
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<tr>
<td>Past experience</td>
<td></td>
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</tr>
<tr>
<td>Proper use of cleaning equipment (demonstration) (disinfectants)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Discuss display equipment</td>
<td>A. Set up individual work areas, with proper equipment at each area (as stated by instructor).</td>
<td>A. Oral or written test identifying tools needed for dog grooming.</td>
</tr>
<tr>
<td>B. Dittos with list of equipment</td>
<td>B. Examine and handle all equipment</td>
<td></td>
</tr>
<tr>
<td>C. Texts (Shirlee Kalstone) &amp; Pubs. (Pets/Supplies/Marketing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Past experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Catalogs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>Unit 3 - Function and proper use of equipment</strong></td>
<td><strong>A. Holding (Oster clipper scissors, comb, brush)</strong></td>
<td></td>
</tr>
<tr>
<td>Objective #3</td>
<td>B. Use</td>
<td></td>
</tr>
<tr>
<td>Students will demonstrate the function and use of dog</td>
<td>C. Function</td>
<td></td>
</tr>
<tr>
<td>grooming equipment</td>
<td>D. Safety</td>
<td></td>
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<tr>
<td></td>
<td>A. List of problems which might arise in grooming equipment and how to</td>
<td></td>
</tr>
<tr>
<td></td>
<td>deal with them.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Care of equipment (preventive maintenance)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. How to clean a clipper</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. How to oil and grease a clipper</td>
<td></td>
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<tr>
<td></td>
<td>. How to change brushes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. How to change blades</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. How to sharpen blades and shears</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. How to solve heat problems with clipper and blades (Oster spray lube)</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Instructor will demonstrate to class how each tool is held, used and its function</td>
<td>A. Students will use equipment under shop conditions and hold, use, and understand what it will do.</td>
<td>A. Teacher evaluation of students ability to groom.</td>
</tr>
<tr>
<td>B. Demonstrate under grooming shop conditions.</td>
<td>B. Comb and brush a dog.</td>
<td></td>
</tr>
<tr>
<td>C. Discuss safety and neatness</td>
<td>C. Attach and remove clipper blades from Oster A2 &amp; A5 machine</td>
<td></td>
</tr>
<tr>
<td>D. Slide presentation from (Lambert Kay) Poodle grooming</td>
<td>D. Scissor and use thinning shears on lab dogs.</td>
<td></td>
</tr>
<tr>
<td>E. Film</td>
<td>E. Judge how much hair each blade leaves.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Texts</td>
<td>A. Clean and maintain equipment</td>
<td>A. Teacher evaluation of students ability to maintain clippers and shears.</td>
</tr>
<tr>
<td>B. Supervised study using magazines.</td>
<td>B. Change brushes in A5 and A2 Oster machine - oil, grease</td>
<td></td>
</tr>
<tr>
<td>C. Publications for maintenance of equipment</td>
<td>C. Spray lube blades to (cool, lube, and clean) prevent failure.</td>
<td></td>
</tr>
<tr>
<td>D. Demonstrate how to change brushes in an Oster A5 or A2 machine.</td>
<td>D. Students will remove hair from clippers to prevent machine from getting hot.</td>
<td></td>
</tr>
<tr>
<td>E. Demonstrate symptoms of pulsating and erratic machines and how to correct them.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Demonstrate how to clean out hair that gets inside the machine and what causes the machine to get hot.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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7
## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 5 - Purchasing of equipment</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #5</td>
<td>A. Quality of different types of equipment from: Oster Co. General Co. Lambert Kay</td>
</tr>
<tr>
<td>Students will be able to list and order equipment, (for quality and usability) for grooming.</td>
<td>B. Catalogs: C. Prices:</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>A. Demonstrating quality of workmanship in equipment for grooming for durability, strength, ease of operation.</td>
<td>A. Examine and use various pieces of equipment and compare strength and durability.</td>
</tr>
<tr>
<td>B. Class discussion—quantity of equipment groomer should have on hand.</td>
<td>B. Demonstrate ordering and use of catalogs for grooming.</td>
</tr>
<tr>
<td>C. Catalogs and ordering procedures.</td>
<td></td>
</tr>
<tr>
<td>D. Guest speaker from equipment company.</td>
<td></td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - Basic Dog Grooming

RESOURCE MATERIALS

   Poodle Grooming by Shirlee Kalstone, 2224 Monongahela Blvd., McKeesport, Penn. 15132
   Terrier Grooming
   Spaniels Grooming

B. Periodicals - Pets/Supplies/Marketing, by Harcourt, Brace, Jovanovich Publications, Corp., 757 Third Ave., New York 10017
   - The Professional Groomer, by Shirlee A. Kalstone, 2224 Monongahela Blvd., McKeesport, Penn. 15132

C. Audiovisuals - Poodle Grooming by Shirlee Kalstone, Lambert Kay Corp., Los Angeles, Calif.
MODULE OF INSTRUCTION

Title - EXTERNAL CARE AND PARTS OF THE DOG

DESCRIPTION:

In this module the student will be involved in identifying the profile of a dog. Work will be done with live animals and in the laboratory setting. Particular attention will be given to special aspects of grooming including the dog's nails and ears. Equipment use and care will be stressed.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1. Dog profile</td>
</tr>
<tr>
<td>2. Canine ears</td>
</tr>
<tr>
<td>3. Canine nails</td>
</tr>
</tbody>
</table>

Revised June 1974
OBJECTIVES to be obtained:

The student will be able to:

1. List and identify 25 areas which include danger areas on a dog.
2. Identify parts of the ear.
3. Clean canine ear, demonstrating skills in safety and without discomfort to the animal.
4. Cut nails to the recommended acceptance of the instructor.
5. File nails.
### OBJECTIVES BY UNIT

#### Unit 1 - Dog profile

**Objective #1**
List and identify 25 areas, including danger areas on the dog.

#### Unit 2 - Canine ears

**Identify the parts of a canine ear.**

**Objective #3**
Students will clean canine ears.

### CONTENT

**A. Transparencies of profile of a dog**

**B. Parts listed**

**A. Ear parts**

**B. More sensitive areas**

A. **Cleaning materials:**
- Cotton (balls, swabs)
- Mineral oil (room temperature)
- Powder (medicated or plain)
- Paper towels
- Alcohol

B. **Tools:**
- Tweezers (blunt)
- Forceps (needle or Kelly type)
- Tray with alcohol

C. **Process:**
- Place animal on table
- Fold ear over side of head
- Use of forceps to remove hair
- Use of swabs
- Clean with oil
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
</table>
| A. Transparency of dog  
B. Ditto of external dog parts  
C. Class discussion: The 25 points of the dogs and the danger areas, in grooming. | A. Mark up ditto and take notes so that the various parts of a dog can be remembered. | A. Oral or written objective test of the 25 parts of the dog's profile. |
| A. Class discussion  
B. Supervised study  
C. Ditto - Diagram of canine ear | A. Observe teacher demonstrations.  
B. Record notes on important ear parts. | A. Oral or written test to identify the parts of the canine ear. |
| A. Discussion of cleaning materials and tools.  
B. Instructor will demonstrate cleaning ears | A. Practice cleaning ear of a dog, pulling hair out and swabbing with oil. | A. Practical test  
B. Remove all hair and dirt to standards of instruction. |
## OBJECTIVES BY UNIT

**Unit 3 - Canine nails**

**Objective #4**
Cut nails to the recommended acceptance of the instructor

**Objective #5**
File nails

### CONTENT

**A. Equipment for cutting nails**
- Scissor type nail cutters
- Guillotine type

**B. Safety**
- Animal's black nails and white nails
- Technicians

**C. Procedure**
- Holding of paw
- Use of both hands
- File in upward motions

**D. Use of coagulants for bleeding from overcutting**
- Silver nitrate

---

**A. Types of files**

**B. Safety**
- Animals
  - white and black nails
  - technicians

**C. Procedure**
- Holding of paw
- Use of both hands
- File in upward motions

**D. Use of coagulants for bleeding from overcutting**
- Silver nitrate

*Note - if nail does not need to be cut, file only*
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>A. Students will use live dogs to do what instructor has demonstrated.</td>
<td>A. Instructor's evaluation of students' ability to cut nails on a dog.</td>
</tr>
<tr>
<td>B. Demonstration: Diagram on chalkboard of nail show how much of nail to cut so as not to sever quick.</td>
<td>B. Cut nails</td>
<td></td>
</tr>
<tr>
<td>C. Demonstration: Live dog Hold nail clippers in hand, with the hand grasping foot and proceed to cut nail being careful not to cut quick.</td>
<td></td>
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</tr>
</tbody>
</table>

A. Review above demonstration from a diagram of nail
B. Demonstration: After nail has been cut, hold paw in one hand and file in other. File in an upward motion until rounded.
C. The procedure is followed on each nail.

A. Observe demonstration
B. Practice what has been observed and file nails on a live dog.

A. Instructor's evaluation of students' ability to file dog's nails.
Title: EXTERNAL CARE AND PARTS OF THE DOG

RESOURCE MATERIALS

Overhead slides, teacher made.
Teacher made ditto.
1. Brush or flag
2. Point of rump
3. Hock
4. Stifle
5. Chest
6. Elbow
7. Pastern
8. Knee
9. Forearm
10. Point of shoulder
11. Shoulder
12. Ear or leather
13. Dewlap
14. Lips or flews
15. Cheek
16. Nose
17. Muzzle
18. Stop
19. Skull
20. Occiput
21. Arch or chest
22. Withers or top of shoulders
23. Hip
24. Loin
25. Tuck
Title - TRAINING DOGS

DESCRIPTION:

The student will learn to train a dog by first learning how dogs react to different types of rewards and punishments. The student will then learn to train a puppy or dog in simple things such as house breaking, controlling barking and curbing. The student will then learn to train dogs to heel and respond to commands such as sit, stand, and stay. The student will be able to apply this knowledge in training dogs to do tricks such as rolling over and playing dead.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th></th>
<th>Time Allocation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. How Dogs Learn</td>
<td>1</td>
</tr>
<tr>
<td>2. Simple Training</td>
<td>0</td>
</tr>
<tr>
<td>3. Novice Obedience Training</td>
<td>0</td>
</tr>
<tr>
<td>4. Advanced Obedience Training</td>
<td>0</td>
</tr>
<tr>
<td>5. Teaching Tricks</td>
<td>0</td>
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<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Revised April '75
Title - Training Dogs

OBJECTIVES to be obtained:
The student will be able to:

1. List 5 possible reactions of a dog to specific forms of training and relate dogs reactions to these various methods.

2. Demonstrate skills in making use of the dogs reactions in training them.

3. House break and curb a dog.

4. Demonstrate the methods used to control a dog's barking and jumping on people.

5. Begin training a dog to heel, sit, and stand, or stay on command.

6. Begin training a dog to come when called, lie down, carry and retrieve items.

7. Demonstrate skills necessary to train dogs tricks such as playing dead or rolling over.
## Training Dogs

### Objectives by Unit

#### Unit 1 - How Dogs Learn

<table>
<thead>
<tr>
<th>Objective 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>List 5 possible reactions of a dog to specific methods of training, and relate dogs reactions to these various methods.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Objective 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonstrate skills in making use of the dogs reactions in training them.</td>
</tr>
</tbody>
</table>

### Content

<table>
<thead>
<tr>
<th>A. Reward versus punishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Voice commands affect on dogs</td>
</tr>
<tr>
<td>- How hand and body movements affect dogs</td>
</tr>
<tr>
<td>- Contact (physical)</td>
</tr>
<tr>
<td>- hitting</td>
</tr>
<tr>
<td>- rewarding</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. The trainer's effectiveness based on his control</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>C. Training periods; length and frequency</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>A. Reward - punishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Food</td>
</tr>
<tr>
<td>- Leash control</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Trainer control</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>C. Time periods and frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teaching Methods</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>A. Lecture - Dog obedience</td>
</tr>
<tr>
<td>B. Class discussion</td>
</tr>
<tr>
<td>C. Teacher Demonstrations on dog behavior to rewards and punishments.</td>
</tr>
<tr>
<td>D. Field trip to kennels and shows where dogs are trained and being trained.</td>
</tr>
<tr>
<td>E. Observe animals behavior to reward and punishment</td>
</tr>
<tr>
<td>A. Review of demonstration rewards and punishment</td>
</tr>
<tr>
<td>B. Supervised practice</td>
</tr>
<tr>
<td>C. Practice skills</td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
</tr>
<tr>
<td>-------------------</td>
</tr>
</tbody>
</table>
| Unit 2 = Simple Training | A. House breaking a dog  
B. Curb training a dog  
C. Controlling dogs barking  
D. Teething of dogs; problems and control |
| Objective 3  
House break and curb a dog | A. Rewards - punishment  
. Food  
. Leash control  
B. Barking  
C. Jumping |
| Objective 4  
Demonstrate the methods used to control a dog's barking and jumping on people. | A. Training a dog to heel  
. Heeling on leash  
. Free heeling  
B. Training a dog to sit and stand on command  
C. Training a dog to stay  
D. Training a dog to come when called (recall)  
E. Training a dog to lie down |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Teacher demonstration</td>
<td>A. Observe demonstration</td>
<td>A. Teacher evaluation of student ability to progress toward house breaking and curbing a dog.</td>
</tr>
<tr>
<td>B. Speaker or field trip</td>
<td>B. Question speaker</td>
<td></td>
</tr>
<tr>
<td>C. Supervised study</td>
<td>C. Practice procedure demonstrated</td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>A. Class lecture and discussion</td>
<td>A. Compile notes</td>
<td>A. Teacher evaluation of student ability to house break and curb a dog.</td>
</tr>
<tr>
<td>B. Teacher demonstration</td>
<td>B. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Guest speaker</td>
<td>C. Practice demonstrated techniques</td>
<td></td>
</tr>
<tr>
<td>D. Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Class discussion - reward and punishment relating to obedience</td>
<td>A. Participate in discussion</td>
<td>A. Teacher evaluation of student progress in teaching a dog to heel, sit, and stand or stay on command.</td>
</tr>
<tr>
<td>B. Guest speaker - dog trainer</td>
<td>B. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Demonstrations and laboratory exercises on training dogs.</td>
<td>C. Practice demonstrated techniques</td>
<td></td>
</tr>
<tr>
<td>D. Supervised study</td>
<td>D. Begin training one's own dog if applicable</td>
<td></td>
</tr>
</tbody>
</table>

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Title: Training Dogs

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 4 - Advanced Obedience Training</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Objective 6 | A. Carrying Items  
B. Retrievering  
C. Jumping Objects |
| **Unit 5 - Teaching Tricks** | |
| Objective 7 | A. Intelligence and ability of the animal  
. The ability range of dogs  
. The ability of the particular dog  
B. Age of animal to be trained  
C. Methods of approach  
D. Persistence, practice and review |

Agricultural
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>1. Participate in discussion</td>
<td>1. Teacher evaluation of student methods of training.</td>
</tr>
<tr>
<td></td>
<td>2. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>B. Guest speaker - dog trainer</td>
<td>3. Practice demonstrated techniques</td>
<td></td>
</tr>
<tr>
<td>C. Teacher demonstration</td>
<td>4. Continue training one's own dog</td>
<td></td>
</tr>
<tr>
<td>D. Supervised study</td>
<td>5. Prepare a group demonstration of the skills learned for a public gathering</td>
<td></td>
</tr>
</tbody>
</table>

- **A.** Class discussion
  - of principles previously learned.
- **B.** Guest speaker - dog trainer
- **C.** Teacher demonstration
- **D.** Supervised study
- **E.** Public demonstration by the class

**EVALUATION PROCEDURES**

- **A.** Participate in discussion
- **B.** Observe demonstration
- **C.** Practice demonstrated techniques
- **D.** Continue training one's own dog
- **E.** Prepare a group demonstration of the skills learned for a public gathering.
MODULE OF INSTRUCTION

Title - Training Dogs

RESOURCES MATERIALS

Books - USAF Sentry Dog Program
        AF Manual 125-5
        U. S. Government Printing Office
        Washington, D. C.

        Training You To Train Your Dog
        Blanche Saunders
        Doubleday & Company, Inc.
        Garden City, New York
Title - CARE OF BIRDS

DESCRIPTION:

The instruction will include identification, care for and handling of the common species of pet and laboratory bird. Students will be instructed in recognizing the species of birds and the methods of ringing or banding the legs of individual birds. The student will study environmental requirements such as temperature, humidity and special recommendations for each species. Feed requirements and various methods of restraining or handling birds will be included as part of the instruction. The student will be made aware of the common diseases and problems of birds. Nail clipping and simple first aid procedures are covered in this module.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Types of Birds</td>
<td>2</td>
</tr>
<tr>
<td>2. Environment and Handling</td>
<td>1</td>
</tr>
<tr>
<td>3. Health and First Aid</td>
<td>2</td>
</tr>
<tr>
<td>4. Breeding</td>
<td>1/6</td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - CARE OF BIRDS

OBJECTIVES to be obtained:
The student will be able to;

1. Identify by sight 30 common pet and laboratory species of birds.
2. Comfortably handle common pet and lab species of birds.
3. Ring or band the legs of birds without causing injury to the bird.
4. Prepare a list of requirements of birds including temperature and special requirements in captivity.
5. Handle birds and clip feathers, nails, and beaks without injury.
6. Clean bird cages and other equipment to satisfy employer needs.
7. List causes, symptoms and controls of 35 diseases of birds and recognize the live symptoms of 10 of these.
8. List various procedures for breeding birds in captivity and hatching their eggs.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Types of Birds</strong>&lt;br&gt;Objective 1&lt;br&gt;Identify by sight 30 common pet store and lab species of birds</td>
<td>A. Fowl and quail&lt;br&gt;B. Pigeons and doves&lt;br&gt;C. Sparrows and starlings&lt;br&gt;D. Canaries and finches&lt;br&gt;E. Parakeets and parrots&lt;br&gt;F. Other birds as pets</td>
</tr>
<tr>
<td><strong>Unit 2 - Environment and Handling</strong>&lt;br&gt;Objective 2&lt;br&gt;Comfortably handle common pet store and lab species of birds</td>
<td>A. Fear of handlers, birds&lt;br&gt;B. Relaxation&lt;br&gt;C. Approach&lt;br&gt;D. Safety of bird&lt;br&gt;E. Safety of handler&lt;br&gt;1. Injury&lt;br&gt;2. Disease contamination</td>
</tr>
<tr>
<td>Objective 3&lt;br&gt;Ring and band the legs of birds without causing injury to the bird</td>
<td>A. Approach&lt;br&gt;B. Handling&lt;br&gt;C. Installing the ring</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>----------------------------------------------</td>
</tr>
<tr>
<td>A. Identification slides of birds</td>
<td>A. Compile notes</td>
</tr>
<tr>
<td>B. Class Discussion</td>
<td>- List of birds</td>
</tr>
<tr>
<td>C. Supervised study</td>
<td>- Pictures of birds listed</td>
</tr>
<tr>
<td>D. Give animal identification</td>
<td>- Particular means of identification</td>
</tr>
<tr>
<td>E. Field trip</td>
<td></td>
</tr>
<tr>
<td>A. Discussion</td>
<td>A. Participate in discussion</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Observe demonstration</td>
</tr>
<tr>
<td>C. Demonstration</td>
<td>C. Practice handling birds</td>
</tr>
<tr>
<td>D. Field trip</td>
<td></td>
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<tr>
<td>E. Supervised practice</td>
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<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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</tr>
</tbody>
</table>
| Objective 4        | A. Housing  
| Prepare a list of environmental requirements of 50 birds, including temperature, and special requirements in captivity |
|                     | . Types of cages  
|                     | . holding or stock  
|                     | . breeding  
|                     | . pens or aviaries  
|                     | . show  
|                     | . Temperature, humidity and light requirements  
|                     | . Floor covering (cage)  
|                     | B. Feeding and watering |
| Objective 5        | A. Handling and controlling birds when clipping  
| Handle birds and clip feathers, nails and beaks without injuring them. |
|                     | . Safety  
|                     | B. Clipping  
|                     | . Feathers  
|                     | . Beaks  
|                     | . Toes |
| Unit 3 - Health and First Aid | A. Sanitation  
| Objective 6        | . Prevention of disease  
| Clean bird cages and other equipment to satisfy employer needs |
|                     | . Odors  
|                     | B. Methods of sterilization  
|                     | . Heat  
<p>|                     | . Chemical |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in class discussion</td>
<td>A. Oral or written test</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Prepare notes of requirements on at least 50 species of birds and record in a notebook</td>
<td>1. Types of cages</td>
</tr>
<tr>
<td>. Handbook on cage birds</td>
<td></td>
<td>2. Atmospheric requirements of 10 birds</td>
</tr>
<tr>
<td>. Lab animal care</td>
<td></td>
<td>3. Feeding requirements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. Teacher evaluation of students list in notebook</td>
</tr>
<tr>
<td>A. Teacher demonstration</td>
<td>A. Observation of teacher demonstration</td>
<td></td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td>B. Practice of skills demonstrated</td>
<td>A. Teacher evaluation of students ability to handle and clip birds.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Lecture-discussion</td>
<td>A. Take notes</td>
<td>A. Oral or written test</td>
</tr>
<tr>
<td>B. Demonstration of techniques of sterilization</td>
<td>B. Participate in discussion</td>
<td>1. Methods of sterilization</td>
</tr>
<tr>
<td>. Film, <em>Surgery of Subcutaneous Tremors in Parrakeets</em></td>
<td>C. Practice techniques of sterilization demonstrated</td>
<td>2. List the sterilants available and relate each to its purpose</td>
</tr>
<tr>
<td>. Stroud's Digest on Diseases of Birds</td>
<td></td>
<td>B. Teacher evaluation of students techniques of sanitation</td>
</tr>
<tr>
<td>. Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>. Supervised practice</td>
<td></td>
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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 7</td>
<td>A. Precautionary care for new animals</td>
</tr>
<tr>
<td></td>
<td>B. Disease</td>
</tr>
<tr>
<td></td>
<td>- Definition</td>
</tr>
<tr>
<td></td>
<td>- Relationship to stress</td>
</tr>
<tr>
<td></td>
<td>C. Ailments</td>
</tr>
<tr>
<td></td>
<td>- Puffing</td>
</tr>
<tr>
<td></td>
<td>- Loss of feathers</td>
</tr>
<tr>
<td></td>
<td>- Broken wings or legs</td>
</tr>
<tr>
<td></td>
<td>- Asthma, colds and fits</td>
</tr>
<tr>
<td></td>
<td>- Diarrhea and enteritis</td>
</tr>
<tr>
<td></td>
<td>- Egg binding</td>
</tr>
<tr>
<td></td>
<td>- Wounds</td>
</tr>
<tr>
<td></td>
<td>- Other health problems</td>
</tr>
</tbody>
</table>

Unit 4 - Breeding
Objective 8
List various procedures for breeding birds in captivity and hatching their eggs.

A. Signs of breeding periods
   - Seasons
   - Species involved
   - Male-female relationship

B. Process of mating

C. Nesting
   - Boxes or sites
   - Nesting materials

D. Egg laying
   - Feeding young
   - Weaning

E. Identification of stock
   - Banding or ringing legs
   - Stock records
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in discussions</td>
<td>A. Teacher’s evaluation of students list of diseases</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Prepare questions for speaker</td>
<td>B. Oral or written test</td>
</tr>
<tr>
<td></td>
<td>C. Compile list of diseases for the notebook</td>
<td>List causes, symptoms and controls of 15 diseases in birds and relate each with the bird it affects.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Demonstrate ability to recognize 10 of these diseases</td>
</tr>
<tr>
<td>C. Guest speaker—veterinarian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Group technique of researching cause, symptoms and control of diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Let groups of students prepare portions of the research and report to the rest of the class</td>
<td></td>
</tr>
<tr>
<td>A. Lecture-discussion</td>
<td>A. Participate in class discussion</td>
<td>A. Oral or written test</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Vote-taking</td>
<td>. Uro-genital system of male and female</td>
</tr>
<tr>
<td></td>
<td>Film - Chick Embryo</td>
<td>. Male-female relationships</td>
</tr>
<tr>
<td></td>
<td>Film - How do Animals Care for their Young</td>
<td>. Nesting materials</td>
</tr>
<tr>
<td>C. Observation of birds</td>
<td>C. Record dates of copulation</td>
<td>. Feeding</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

| CODE | 01.0101010702-01 |
| TITLE | CARE OF BIRDS |
| | |

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9
RESOURCE MATERIALS

A. Books

Stroud's Digest on the Diseases of Birds
Robert Stroud
T.F.H. Publications Inc.
Jersey City, N.J. $9.00

The UFAW Handbook
Care and Management of Laboratory Animals
Edited by Staff of UFAW
3rd Edition
E. & S. Livingstone LTD
England $22.00

Chickens
National Academy of Sciences
Washington D.C.

A Handbook on Cage Birds
Modern Veterinary Practice (Red Book Ed.)
American Veterinary Publications Inc.
Wheaton, Ill.

C. Periodicals

Laboratory Animal Digest
Ralston Purina Co
St. Louis, Missouri

Laboratory Animal Care
American Association for
Laboratory Animal Science
Joliet, Illinois
D. Audiovisuals

Slides 2" by 2" Kodachrome
may be obtained from the Audubon Society
or Biological supply houses such as Wards
or Turtox

Films,

Chick Embryo
McGraw-Hill Book Co
Text-Film Div
New York, New York

How Do Animals Care for Their Young
#A Care of The Young
NBC Animal Series Films
American Library Association

Surgery of Subcutaneous Tumors in Parakeats
American Veterinary Medical Association

Chicago Illinois
TITLE - CARE AND MAINTENANCE OF TROPICAL FISH

DESCRIPTION:

The student will identify the various types of tropical fish. The identification will include the sex of the individual fish. Also select the proper methods of setting up tropical fish tanks (aquariums) for display, breeding, and sales. He will select and breed both the live bearers and egg laying fish. The student will also be able to identify the different types of plants used in aquariums. The care of the fish will include the use of the various types of equipment such as air pumps, filters, breeding equipment and other items used in the aquarium. He also will list the different types of fish diets and the purposes of some of the supplements fed fish. The student will list and identify the different common diseases of tropical fish and plants as well as some of the other problems of fish tank management. The treatment and prevention of the common diseases will also be covered.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Types of tropical fish</td>
<td>1</td>
</tr>
<tr>
<td>2. Aquatic plants</td>
<td>1</td>
</tr>
<tr>
<td>3. Aquarium operations</td>
<td>1</td>
</tr>
<tr>
<td>4. Breeding</td>
<td>1</td>
</tr>
<tr>
<td>5. Diet and diseases</td>
<td>1</td>
</tr>
</tbody>
</table>

Revised June 1974
MODULE OF INSTRUCTION

Title - CARE AND MAINTENANCE OF TROPICAL FISH

OBJECTIVES to be obtained:

Student will be able to:

1. Identify 16 anatomical parts of tropical fish
2. Identify 10 types of shoal fish
3. Identify 4 types of surface fish
4. Identify 6 types of bottom fish
5. Sex 1 pair of each group in objectives 1, 2, 3 and 4
6. Identify and characterize 6 types of egg layers
7. Identify and characterize 6 types of live bearers
8. Identify 12 types of aquarium plants
9. Demonstrate planting and propagation of aquarium plants
10. Demonstrate care and lighting of aquarium plants
11. Identify and use 10 pieces of equipment common to aquariums
12. Set up a balanced aquarium from equipment available in laboratory (wash gravel, check pH, decorate and calculate amount of fish per tank size)
13. Net and introduce new fish to established aquariums
14. Select and breed 1 pair of live of live bearers and 1 pair of egg layers
15. Demonstrate use of breeding tanks and plant protection for young
16. Demonstrate care of young from young egg and live bearers.
17. Identify and state 8 common diseases and treatment of tropical fish
18. State and identify 5 types of dried and live food used in feeding
19. Demonstrate feeding fish live/dried food and use of automatic feeder
20. Demonstrate methods of raising and storing live food
Title: CARE AND MAINTENANCE OF TROPICAL FISH

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Types of tropical fish</strong></td>
<td><strong>A. Anatomy</strong></td>
</tr>
<tr>
<td>Objective #2 Identify 10 types of shoal fish</td>
<td><strong>A. Shoal fish</strong></td>
</tr>
<tr>
<td>Objective #3 Identify 4 types of surface fish</td>
<td><strong>A. Surface fish</strong></td>
</tr>
<tr>
<td>Objective #4 Identify 6 types of bottom fish</td>
<td><strong>A. Bottom fish</strong></td>
</tr>
<tr>
<td>Objective #5 Sex 1 pair from each group of objectives 2-4</td>
<td><strong>A. Shoal</strong></td>
</tr>
<tr>
<td></td>
<td><strong>B. Surface fish</strong></td>
</tr>
<tr>
<td></td>
<td><strong>C. Bottom fish</strong></td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
</tbody>
</table>
| A. Chart of anatomical parts  
B. Live specimens in tanks  
C. Texts  
D. Dittos | A. Fill in on dittos 16 parts of fish.  
B. Identify on live specimens | A. Oral or written test  
B. State and/or write 16 anatomical parts of fish from memory |
| A. Live specimens in tanks  
B. Slides/movies  
C. Texts  
D. Field trips -- local pet shops, aquariums | A. Identify 10 shoal fish in tanks  
B. Live specimens/pictures | A. Oral or written test  
B. Identify 10 shoal fish from assorted tanks/pictures from memory |
| A. Live specimens in tanks (if possible) or pictures  
B. Field trips -- pet shops, aquariums | A. Identify 4 surface fish in tanks/pet shops, pictures or aquariums | A. Oral or written test  
B. Identify 4 surface fish from assorted tanks/pictures. |
| A. Live specimens in tanks (if possible) or pictures  
B. Field trips -- pet shops, aquariums | A. Identify 6 bottom fish in tanks  
B. Live specimens/pictures | A. Oral or written test  
B. Identify 6 bottom fish from assorted tanks/pictures. |
| A. Live specimens in tanks (if possible) or pictures | A. Sex all types of shoal, surface and bottom fish by color or anatomical features | A. Oral or written test  
B. Sex 1 pair from each group from memory (pictures/live specimens) |

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #6 Identify and characterize 9 types of egg layers/bubble nest builders</td>
<td>A. Egg layers</td>
</tr>
<tr>
<td></td>
<td>. Jack Dempsey</td>
</tr>
<tr>
<td></td>
<td>. Oscar (Marble Cichlid)</td>
</tr>
<tr>
<td></td>
<td>. Pompadour (Discuss)</td>
</tr>
<tr>
<td></td>
<td>. Angel fish</td>
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<tr>
<td></td>
<td>. Jewel fish</td>
</tr>
<tr>
<td></td>
<td>. Egyptian Mouth-Breeder</td>
</tr>
<tr>
<td>Objective #7 Identify and characterize 6 types of live Bearers</td>
<td>A. Live bearers</td>
</tr>
<tr>
<td></td>
<td>. Guppies</td>
</tr>
<tr>
<td></td>
<td>. Swordtails</td>
</tr>
<tr>
<td></td>
<td>. Platys</td>
</tr>
<tr>
<td></td>
<td>. Mollies</td>
</tr>
<tr>
<td></td>
<td>. Herterandria</td>
</tr>
<tr>
<td></td>
<td>. Gambusia</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Live specimens in tanks/pictures or slides</td>
<td>A. Identify and memorize 9 species of egg layers in tanks/pictures</td>
</tr>
<tr>
<td>B. Texts</td>
<td></td>
</tr>
<tr>
<td>C. Field trips --pet shops</td>
<td></td>
</tr>
</tbody>
</table>

A. Same as above

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>A. Identify and memorize 6 species of live bearers in tanks/pictures</td>
<td>A. Identify from memory 6 species of live bearers from assorted fish tanks</td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
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<tr>
<td>-------------------</td>
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<tr>
<td><strong>Unit 2 - Aquatic plants</strong></td>
<td><strong>A. Aquarium Plants</strong></td>
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<tr>
<td>Objective #8</td>
<td>Identify 12 types of aquarium plants.</td>
<td></td>
</tr>
<tr>
<td>Objective #9</td>
<td>Demonstrate planting and propagation of 4 aquarium plants</td>
<td></td>
</tr>
<tr>
<td>Objective #10</td>
<td>Demonstration of care and lighting of aquarium plants</td>
<td></td>
</tr>
<tr>
<td><strong>A. Aquarium Plants</strong></td>
<td>Sagittaria natans</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hygrophila polyperma</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amazon</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Anacares</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cabomba</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hornwort</td>
<td></td>
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<tr>
<td><strong>B. Aquarium media</strong></td>
<td>Gravel - coarse, medium and fine</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Water - P.H.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pots and soil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paint brush</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scissors</td>
<td></td>
</tr>
<tr>
<td><strong>C. Lighting</strong></td>
<td>Fertilizer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Scissors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reflectors</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Light (incandescent, fluorescent)</td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th><strong>Unit 3 - Aquarium operations</strong></th>
<th><strong>A. Equipment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #11</td>
<td>Identify and use 10 pieces of equipment most common to aquariums</td>
</tr>
<tr>
<td><strong>A. Equipment</strong></td>
<td>Aquarium tanks (5½ gal, 10, 15, 20, 30, 35 and 125 gal)</td>
</tr>
<tr>
<td></td>
<td>Pumps (piston, vibrator type)</td>
</tr>
<tr>
<td></td>
<td>Filters (corner, undergravel, and outside)</td>
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<tr>
<td></td>
<td>Reflectors (lighting - incandescent, fluorescent)</td>
</tr>
<tr>
<td></td>
<td>Gravel (coarse, medium, fine)</td>
</tr>
<tr>
<td></td>
<td>Heaters</td>
</tr>
<tr>
<td></td>
<td>Thermometers (hanging and floating)</td>
</tr>
<tr>
<td></td>
<td>Stands for tanks</td>
</tr>
<tr>
<td></td>
<td>P.H. kits (Sr. Wardley PH kit)</td>
</tr>
<tr>
<td></td>
<td>Nets</td>
</tr>
<tr>
<td></td>
<td>Miscellaneous equipment (charcoal, filter fiber, etc.)</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
</tbody>
</table>
| A. Supervised Study  
Pictures of aquatic plants  
Live specimens in fish tanks/plastic  
Field trips to pet shops/local ponds  
Texts | A. Identify 12 common aquarium plants  
Live pictures | A. Students will select and name 12 aquarium plants from memory  
Oral or written test |
| B. Pictures of planting procedures  
Live plants/plastic  
Demonstrations of planting and propagation | B. Students will demonstrate planting and propagation  
Live/plastic plants in various tank setups | B. Students will select and plant 4 types of aquarium plants  
Demonstrate propagation  
Oral or written test |
| C. Texts  
Demonstration of the use of fertilizer  
Making cuttings  
Cleaning  
Use of lighting (amounts each individual plant needs) | C. Students will demonstrate fertilizing, cleaning, and use of lighting for individual tanks | C. Demonstrate setting up lights/use of sunlight for specific types of plants  
Use of fertilizers, cleaning plants from memory  
Oral or written test |
| A. Use of all aquarium equipment  
Texts  
Field trips (local pet shops, zoos)  
Demonstrations | A. Student usage of all equipment needed to set up balanced aquarium | A. Identify and use 10 most commonly used pieces of equipment from memory  
Oral or written test |

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OBJECTIVES BY UNIT

Objective #12
Set up a balanced aquarium from equipment available in laboratory (wash gravel, check pH, decorate and calculate amount of fish per tank)

Objective #13
Net and introduce new fish to established aquariums

Unit 4 - Breeding Tropical Fish
Objective 14
Select and breed 1 pair each of live bearers and egg layers.

Objective #15
Demonstrate use of breeding tanks and plant protection for young

Objective #16
Demonstrate care of young from live bearers and egg layers

CONTENT

A. Procedures
. Clean aquarium
. Wash gravel
. Decorate
. Check pH
. Cure tank before fish can be introduced
. Fish per tank

A. Nets, plastic bags, plastic containers and established tanks

A. Live Bearers
. Guppies
. Swordtails
. Platys
. Mollies

Egg Layers
. Dempsey
. Angel
. Betta
. Gourames

A. Facilities
B. Breeding tanks/cages (plastic or glass)
Types of plants that offer protection (hair grass, floating plants, etc.)

A. Special Care
B. Young from egg and live bearers, various types
C. Feeding and environment
D. Tanks and separation
<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
</table>
| A. Use of all aquarium equipment  
Texts  
Field trips (local pet shops, zoos)  
Demonstrations | A. Students will wash gravel, clean tanks, decorate, check P.H., cure water, calculate amount of fish per tank size  
A. Students will net various species of fish that are compatible with each other in community tanks  
Demonstrate proper equalizing procedures when transferring new fish | A. Set up complete balanced aquarium for equipment in laboratory  
Clean tanks, wash gravel, decorate and calculate amount of fish per tank  
Teacher evaluation |
| A. Use of nets, plastic bags and containers and fish tanks |  | A. Demonstrate netting and equalizing of fish for introduction into new tanks  
Teacher evaluation |
| Texts/pictures  
Assorted live bearers and egg layers  
Tanks  
Demonstrations  
Live specimens | A. Selection of breed egg layers and live bearers (color, size and condition)  
A. Set up breeding tank and use of equipment and plants  
A. Care of various live young  
Feeding and separation | A. Student will breed 1 pair each of egg layers and live bearers  
Teacher evaluation |
| A. Demonstrations of equipment  
Texts/pictures |  | A. Demonstrate setting up breeding tank and plant protection  
Teacher evaluation |
| A. Demonstrations  
Live specimens  
Texts |  | A. Demonstrate care and feeding of young from live bearers and egg layers  
Teacher evaluation |
## CARE AND MAINTENANCE OF TROPICAL FISH

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 5 - Diet and diseases</strong></td>
<td><strong>A. Disease</strong></td>
</tr>
<tr>
<td>Objective #17</td>
<td><strong>. Dropsy</strong></td>
</tr>
<tr>
<td>Identify and state 8 common diseases and treatment of tropical fish</td>
<td><strong>. Flukes</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Itch</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Fungus</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Shakes and shimmee</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Wasting</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Swim bladder trouble</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Wounds</strong></td>
</tr>
<tr>
<td><strong>Objective #18</strong></td>
<td><strong>N. Chemicals for Treatment</strong></td>
</tr>
<tr>
<td>State and identify 5 types of dried and live tropical fish food</td>
<td><strong>. Itch out</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Metalone blue</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Mercurochrome</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Fungicide</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Also use of heat</strong></td>
</tr>
<tr>
<td><strong>Objective #19</strong></td>
<td><strong>A. Live Food</strong></td>
</tr>
<tr>
<td>Demonstrate feeding fish live/dried food and use of autofish feeder</td>
<td><strong>. Daphnia</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Tubifex worms</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Brine shrimp</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Infusoria</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. White worms</strong></td>
</tr>
<tr>
<td><strong>Objective #20</strong></td>
<td><strong>B. Dried/Freeze Dried</strong></td>
</tr>
<tr>
<td>Demonstrate methods of raising and storage of live food</td>
<td><strong>. Daphnia</strong></td>
</tr>
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<td></td>
<td><strong>. Tubifex worms</strong></td>
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<td></td>
<td><strong>. Brine shrimp</strong></td>
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<tr>
<td></td>
<td><strong>. Supplements/mixes</strong></td>
</tr>
<tr>
<td><strong>A. Same food as above</strong></td>
<td><strong>A. Raising</strong></td>
</tr>
<tr>
<td></td>
<td><strong>. Live Food</strong></td>
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<td></td>
<td><strong>. Dried/Freeze Dried</strong></td>
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<td></td>
<td><strong>. Daphnia</strong></td>
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<td></td>
<td><strong>. Brine shrimp</strong></td>
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<tr>
<td></td>
<td><strong>. Tubifex worms</strong></td>
</tr>
<tr>
<td><strong>B. Storage</strong></td>
<td><strong>B. Storage</strong></td>
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<tr>
<td></td>
<td><strong>. Sytrafoam tub</strong></td>
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<td></td>
<td><strong>. Air stones</strong></td>
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<td></td>
<td><strong>. Plastic tubing</strong></td>
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<td></td>
<td><strong>. Bowl</strong></td>
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<tr>
<td></td>
<td><strong>. Brine shrimp eggs</strong></td>
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<tr>
<td></td>
<td><strong>. Jar</strong></td>
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</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Demonstration of chemical use disease detection Texts/pictures Live specimens</td>
<td>A. Separate sick fish, diagnose and treat with proper chemical/euthanasia</td>
<td>A. Identify and state 8 common diseases and treatment of tropical fish</td>
</tr>
<tr>
<td>A. Samples of live and dried foods Pictures/texts Nutritional values--charts</td>
<td>A. Identification of live and dried food Check protein and nutritional values of dried and live food</td>
<td>A. Identify and state 5 types of dried and live tropical fish food</td>
</tr>
<tr>
<td>A. Demonstrate feeding procedures and amount Use of automatic feeders</td>
<td>A. Feed live and dried fish food in proper amounts and use of automatic fish feeder</td>
<td>A. Feed fish live and dried foods and use of automatic fish feeder</td>
</tr>
<tr>
<td>A. Demonstrate washing tubifex worms Hatching brine shrimp Storage of all Feeding live food Field trips to catch our own live food (ponds)</td>
<td>A. Hatch brine shrimp Raise white worms Store and care of daphnia and tubifex Siphon off dead live-food</td>
<td>A. Student will demonstrate proper methods of hatching brine shrimp and care and storage of other live food</td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - CARE AND MAINTENANCE OF TROPICAL FISH

Code - 01.0101010702-02

RESOURCE MATERIALS

Books -
2. Freshwater Tropical Aquarium Fishes, Hervey & Hems (Batchworth)
3. Tropical Fish, Mann (Sentinel Books Publishers, Inc.)
4. Exotic Aquarium Fishes, Innes (T.F.H. Publications)
5. 1001 Answers to Questions About Aquarium Fishes, Mellen & Robert (Grosset & Dunlap 1935)
6. The Complete Aquarium, Vogt & Wermuth (Arco Publishing Co.)

Periodicals -
1. The Aquarist and Pond Keeper (Brentford, Middlesex)
2. The Aquarium Journal (magazine of the San Francisco Aquarium Society)
3. Aquarium (Philadelphia, Pa.)
DEFINITIONS

1. **Dorsal Fin** - located in center back of fish body - generally a single fin - exceptions: Darters and Sleepers have double, Cod and Haddock triple fin

2. **Adipose Fin** - some fish have a strong dorsal fin and a fleshy, smaller, weaker fin behind it - the adipose fin - found in such fish as Cat fishes, Salmon and Characins

3. **Caudal Fin** - the tail fin - generally single but in certain (ex-fancy Gold Fish) - tail fin is double - used to propel fish through H2O

4. **Anal Fin** - located on bottom side of fish this fin is generally single - exception: Cod has double

5. **Ventral Fins** - one ventral fin on either side of underneath of fish's body - used for steering fish through H2O

6. **Pectoral Fin** - fins on sides, behind gills and are always single - used to maintain equilibrium

7. **Lower Jaw or Mandible** - Some fish have no teeth in jaws - they have teeth in throat or tongue or none at all - fish teeth are of several types - blunt, sharp, mosaic; etc. - many fish grow new teeth when they get old or broken

8. **Upper Jaw or Maxillary** - some fish have nori, others 2 or 3

9. **Opercle or Operculum** - the covering of the gills - gills used to breath with by extracting O2 from water through them

10. **Caudal Penduncle** - posterior (behind) to anal fin - actual support for tail - directly in front of base of caudal fin

11. **Base of Caudal** - where tail fin adjoins body of fish - this begins fleshy part of fish as opposed to oftentimes spiny texture of tail fin

12. **Lateral Line** - believed to be a sense organ though exact function eludes us - distributes oil over fish body - may help fish to detect vibration which indicate approaching objects - some fish have none, others 2 or 3

13. **Head** -

14. **Snout** -
15. Eye - Note for interest: the Flounder or Flatfish hatch with eye on either side so both are on one side, then fish sinks to bottom of water and swims on one side - color vision - scientists find fish able to distinguish a limited spectrum, i.e., food colors or color of fish nets

16. Nostrils -

NOTE: There are some 30,000 known species of fish - new ones being found almost weekly through world - estimated 600 pigmy species suitable for home aquariums and about 300 are available in United States

Fins - When in good health fins, especially dorsal, are raised When in poor health, lowered
MODULE OF INSTRUCTION

Title - CARE AND HANDLING OF REPTILES AND AMPHIBIANS

The student will identify and handle the different types of non-poisonous reptiles and amphibians normally found in laboratories or pet stores. The identification will include the ability to recognize the different species within each group of reptiles or amphibians. The student will select the housing requirements which include temperature, humidity, area and terrain of cage of each group being studied. The student will select the feed and water requirements of the various groups of reptiles and amphibians and methods of natural and force feeding. The student will recognize some of the common diseases and problems of reptiles and amphibians in captivity. With the diseases the student will learn some of the basic treatments and preventive measures for those commonly encountered. The student will be able to explain some of the methods used to breed reptiles and amphibians in captivity and the rearing of the young.

DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Handling frogs and toads</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2. Handling lizards</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>3. Handling turtles and tortoise</td>
<td>1</td>
<td>5</td>
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<tr>
<td>4. Handling snakes</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>5. Handling salamanders</td>
<td>( \frac{1}{3} )</td>
<td>( \frac{2}{25} )</td>
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</tbody>
</table>

Revised April, 1975
MODULE OF INSTRUCTION
Title - CARE AND HANDLING OF REPTILES AND AMPHIBIANS

OBJECTIVES to be obtained:
The student will be able to:
1. Identify by common name eight frogs and toads.
2. Handle, feed and sex one frog or one toad.
3. Identify the needed environment and set up living quarters for frogs and toads.
4. Identify common problems of frogs and toads in captivity.
5. Care for tadpoles through adult stage.
6. Identify by common name six types of lizards.
7. Handle, feed and sex one lizard.
8. Identify environmental needs and set up living quarters for lizards.
9. Identify common problems of lizards in captivity.
10. Identify by common name 10 types of turtles and tortoises.
11. Handle, feed and sex one each type of turtle and/tortoise.
12. Identify proper environmental needs and set up living quarters for turtle/tortoises.
13. Identify common problems of turtles and tortoises.
14. Identify by common name five common poisonous snakes of U.S.A. and five common nonpoisonous snakes of U.S.A.
15. Handle and feed a nonpoisonous snake.
16. Set up cage/living quarters for one nonpoisonous snake.
17. Identify common problems of snakes.
18. Identify by common name five types of common salamanders.
19. Handle and feed a salamander.
20. Identify and prepare the proper environment for various salamanders.
21. Identify common problems of salamanders.
### Objectives by Unit

<table>
<thead>
<tr>
<th>Objective</th>
<th>Content</th>
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</thead>
<tbody>
<tr>
<td><strong>Objective 3</strong>&lt;br&gt;Identify the needed environment and set up living quarters for frogs and toads</td>
<td>A. Tanks—different sizes/cages&lt;br&gt;. Soil&lt;br&gt;. Gravel&lt;br&gt;. Rocks&lt;br&gt;. Plants&lt;br&gt; A. Tanks—different sizes/cages&lt;br&gt;. Soil&lt;br&gt;. Gravel&lt;br&gt;. Rocks&lt;br&gt;. Plants&lt;br&gt;. Heating&lt;br&gt;. Lighting</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Texts/pictures or slides</td>
<td>A. Study identification of frogs and toads</td>
</tr>
<tr>
<td>- Live specimens</td>
<td></td>
</tr>
<tr>
<td>- Demonstrations</td>
<td></td>
</tr>
<tr>
<td>- Field trips to pet shops, zoos</td>
<td></td>
</tr>
<tr>
<td>A. Handling frogs and toads</td>
<td>A. Handle various frogs and toads</td>
</tr>
<tr>
<td>- Example: A bullfrog like other amphibians is slippery. Encircle its waist with your fingers so it cannot kick itself free. Any large or medium sized frogs may be held in the same way, but small frogs are best grasped by legs.</td>
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<tr>
<td>B. Feeding--demonstrate and list types of food</td>
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<tr>
<td>C. Sexing common frogs and toads</td>
<td></td>
</tr>
<tr>
<td>- Frogs: Example, Bullfrog, the tympanum (ear drum) is larger than eye in males, and only the size of the eye or smaller in females.</td>
<td></td>
</tr>
<tr>
<td>A. Texts</td>
<td>A. Set up various living quarters for frogs and toads.</td>
</tr>
<tr>
<td>- Laboratory exercises in aquarium/terrarium set ups for frogs and toads</td>
<td></td>
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<tr>
<td>- Field trips to pet shops and or zoos</td>
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<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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</tr>
<tr>
<td>Objective 4</td>
<td>Identify one common problem of frogs or toads in captivity.</td>
</tr>
<tr>
<td></td>
<td>A. List of problems of frogs and toads</td>
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<tr>
<td></td>
<td>- Overpopulation</td>
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<td></td>
<td>- Improper living quarters</td>
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<td>- Overfeeding</td>
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<td>- Underfeeding</td>
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<tr>
<td>Objective 5</td>
<td>State care for tadpoles through adult stage</td>
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<tr>
<td></td>
<td>A. Media</td>
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<tr>
<td></td>
<td>- Aquarium tank--assorted sizes</td>
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<td></td>
<td>- Gravel</td>
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<td>- Plants</td>
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<td>- Food--live or dried</td>
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<td>- Rocks</td>
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<tr>
<td>Objective 6</td>
<td>Students will identify by common name six types of lizards</td>
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<tr>
<td></td>
<td>A. Common names</td>
</tr>
<tr>
<td></td>
<td>- Skinks and whiptails</td>
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<tr>
<td></td>
<td>- Iguana family</td>
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<td></td>
<td>- Tree and spiny lizards</td>
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<td></td>
<td>- Eastern collared lizard</td>
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<td></td>
<td>- Gecko family</td>
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<td>- Glass lizards</td>
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<td></td>
<td>- Worm lizards</td>
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<tr>
<td>Objective 7</td>
<td>Handle, feed, and sex one lizard</td>
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<tr>
<td></td>
<td>A. Items needed</td>
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<tr>
<td></td>
<td>- Live specimens</td>
</tr>
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<td></td>
<td>- Gloves</td>
</tr>
<tr>
<td></td>
<td>- Feeding--omnivore, carnivore, herbivore</td>
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<tr>
<td></td>
<td>- Sexing common lizards according to color and size</td>
</tr>
</tbody>
</table>

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### Teaching Methods

<table>
<thead>
<tr>
<th>A. Demonstrate common problems so students are aware of each type.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Demonstrate care and placement of tadpole in aquarium tanks. Same as tropical.</td>
</tr>
<tr>
<td>A. Texts/movies or slides. Laboratory exercises in identification and field trips to local pet shops or zoos.</td>
</tr>
<tr>
<td>A. Lizards are best immobilized by holding their feet but the body should also be gripped to prevent sudden lunges. Make it a practice never to grab or hold a lizard by the tail, for it may break right off in your hands.</td>
</tr>
</tbody>
</table>

### Student Application Activities

| A. Students will correct problems in living quarters set up by instructor and state what was wrong. |
| A. Students will set up and care for tadpoles in an aquarium. |
| A. Study identification of lizards by use of live specimens or pictures. |
| A. Handle various lizards. Feed various lizards. Sex common lizards |

### Evaluation Procedures

| A. Identify one common problem of frog or toad in captivity. |
| A. State care of tadpoles through adult stage. |
| A. Student will identify by name six types of lizards. |
| A. Students will handle, feed and sex probably from memory. |
Title: CARE AND HANDLING OF REPTILES AND AMPHIBIANS

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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<td>Objective 8</td>
<td>A. Materials</td>
</tr>
<tr>
<td></td>
<td>- Tanks--different types/cages</td>
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<tr>
<td></td>
<td>- Soil</td>
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<td></td>
<td>- Gravel</td>
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<td>- Rocks</td>
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<td>- Plants</td>
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<td>- Heat</td>
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<td>- Light</td>
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<tr>
<td>Objective 9</td>
<td>A. Problems</td>
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<td></td>
<td>- Overpopulation</td>
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<td></td>
<td>- Improper living quarters</td>
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<td>- Over feeding</td>
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<td>- Under feeding</td>
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<tr>
<td></td>
<td>- Parasites (mites)</td>
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<tr>
<td>Objective 10</td>
<td>A. Types</td>
</tr>
<tr>
<td></td>
<td>- Snapping turtles</td>
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<td></td>
<td>- Musk and mud turtles</td>
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<td>- Water turtles</td>
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<td>- Box turtles</td>
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<td>Objective 11</td>
<td>A. Gloves</td>
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<td>B. Tanks/cages</td>
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<td>C. Food-live/dead and greens</td>
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<td>D. Sexing turtles and tortoises</td>
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<td></td>
<td>- Color</td>
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<td>- Shape</td>
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<td>- Skin areas</td>
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<tr>
<td>Objective 12</td>
<td>A. Utensils</td>
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<td>- Tanks, all types/cages</td>
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<td></td>
<td>- Soils</td>
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<td>- Water</td>
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<td>- Rocks</td>
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<td>- Plants</td>
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<td>- Heat</td>
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<td>- Light</td>
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<tr>
<td>Objective 13</td>
<td>A. Problems of living</td>
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<td>- Cannibalism</td>
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<td>- Over population</td>
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<td>- Improper living quarters</td>
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<td></td>
<td>- Parasites</td>
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<td></td>
<td>- Feeding</td>
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<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
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</thead>
<tbody>
<tr>
<td>A. Texts</td>
<td>A. Set up terrarium for various lizards.</td>
<td>A. Oral or written test Identify and set up living quarters for lizards.</td>
</tr>
<tr>
<td>A. Demonstrate and correct problems so students are aware of different situations</td>
<td>A. Students will correct problems in living quarters set up by instructor and state what was wrong.</td>
<td>A. Oral or written test Identify and correct one problem that might occur in a terrarium with lizards.</td>
</tr>
<tr>
<td>A. Texts/movies or slides</td>
<td>A. Study identification of turtles and tortoises</td>
<td>A. Identify by common name ten types of turtles and tortoises.</td>
</tr>
<tr>
<td>A. Handling demonstrated; use of gloves and proper holding so turtle can't bite.</td>
<td>A. Handle various types of turtles and tortoise</td>
<td>A. Teacher's evaluation. Handle, feed and sex one of each type turtle and tortoise.</td>
</tr>
<tr>
<td>A. List and explain common problems</td>
<td>A. Students will solve problems set up by instructor.</td>
<td>A. Teacher's evaluation. Identify from set up situations; problems of turtles/tortoise. Correct these problems.</td>
</tr>
</tbody>
</table>

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<tr>
<td>Unit 4 - Handling Snakes</td>
</tr>
<tr>
<td>Objective 14</td>
</tr>
<tr>
<td>Students will identify by common name five common poisonous snakes of U.S.A. and five common non-poisonous snakes.</td>
</tr>
<tr>
<td>Objective 15</td>
</tr>
<tr>
<td>Handle and feed a non poisonous snake.</td>
</tr>
<tr>
<td>Objective 16</td>
</tr>
<tr>
<td>Set up cage/living quarters for one nonpoisonous snake</td>
</tr>
<tr>
<td>Objective 17</td>
</tr>
<tr>
<td>Identify one common problem of snakes.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Poisonous snakes (venomous)</td>
</tr>
<tr>
<td>1. Copperhead</td>
</tr>
<tr>
<td>2. Cottonmouth</td>
</tr>
<tr>
<td>3. Coral snake</td>
</tr>
<tr>
<td>4. Rattlesnakes</td>
</tr>
<tr>
<td>5. Massasauga</td>
</tr>
<tr>
<td>B. Non poisonous (harmless)</td>
</tr>
<tr>
<td>1. Garter snakes</td>
</tr>
<tr>
<td>2. Indigo</td>
</tr>
<tr>
<td>3. Green snakes</td>
</tr>
<tr>
<td>4. Black pacers</td>
</tr>
<tr>
<td>5. Dekay snakes</td>
</tr>
<tr>
<td>6. Hognose</td>
</tr>
<tr>
<td>7. Water snakes</td>
</tr>
<tr>
<td>8. Milk snake</td>
</tr>
<tr>
<td>9. Ringneck</td>
</tr>
<tr>
<td>10. Corn snake</td>
</tr>
<tr>
<td>A. Materials and equipment</td>
</tr>
<tr>
<td>1. Live specimens nonpoisonous snakes</td>
</tr>
<tr>
<td>2. Gloves</td>
</tr>
<tr>
<td>3. Snake stick or snare</td>
</tr>
<tr>
<td>4. Bags</td>
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<tr>
<td>5. Tank/terrarium</td>
</tr>
<tr>
<td>6. Feed--live/dead</td>
</tr>
<tr>
<td>A. Materials</td>
</tr>
<tr>
<td>1. Tanks--all types/cages</td>
</tr>
<tr>
<td>2. Gravel</td>
</tr>
<tr>
<td>3. Soil</td>
</tr>
<tr>
<td>4. Plants</td>
</tr>
<tr>
<td>5. Rocks</td>
</tr>
<tr>
<td>A. Problems</td>
</tr>
<tr>
<td>1. Parasites (mites)</td>
</tr>
<tr>
<td>2. Mouth rot</td>
</tr>
<tr>
<td>3. Cuts</td>
</tr>
<tr>
<td>4. Sores</td>
</tr>
</tbody>
</table>
### TEACHING METHODS

<table>
<thead>
<tr>
<th>A. Texts/movies or slides</th>
</tr>
</thead>
<tbody>
<tr>
<td>. Charts</td>
</tr>
<tr>
<td>. Live specimens</td>
</tr>
<tr>
<td>. Field trips, pet shops, zoos</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Demonstrate handling non poisonous snakes (live specimens)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Feeding live food/dead food</td>
</tr>
<tr>
<td>. Worms</td>
</tr>
<tr>
<td>. Rats</td>
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<tr>
<td>. Frogs</td>
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<tr>
<td>. Toads</td>
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<tr>
<td>. Fish</td>
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<tr>
<td>. Salamanders</td>
</tr>
<tr>
<td>. Mice</td>
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</tbody>
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<thead>
<tr>
<th>A. Texts/movies or slides</th>
</tr>
</thead>
<tbody>
<tr>
<td>. Laboratory exercises in terrarium set ups for snakes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. List and explain common problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>. Texts/movies</td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

<table>
<thead>
<tr>
<th>A. Identification of poisonous and nonpoisonous</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>A. Handling of various non poisonous snakes.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Feeding-live/dead food</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Students will set up terrarium for one non poisonous snake</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>A. Students will identify and solve problems set up by instructor</th>
</tr>
</thead>
</table>

### EVALUATION PROCEDURES

<table>
<thead>
<tr>
<th>A. Identify five poisonous and five non poisonous snakes of U.S.A.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>A. Handle, feed, type of non poisonous.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>A. Set up terrarium for one non poisonous snake</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>A. Identify one common problem of snakes in captivity.</th>
</tr>
</thead>
<tbody>
<tr>
<td>OBJECTIVES BY UNIT</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>Unit 5 - Handling salamanders</td>
</tr>
<tr>
<td>Objective 18</td>
</tr>
<tr>
<td>Identify by common name five types of common salamanders.</td>
</tr>
<tr>
<td></td>
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<tr>
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<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td>Objective 19</td>
</tr>
<tr>
<td>Handle and feed a salamander</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Objective 20</td>
</tr>
<tr>
<td>Identify and prepare proper environment for various salamanders.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Objective 21</td>
</tr>
<tr>
<td>Identify common problems of salamanders</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Texts/movies or slides</td>
<td>A. Study identification of common salamanders</td>
<td>A. Oral or written test</td>
</tr>
<tr>
<td>A. Live specimens</td>
<td>A. Live/pictures</td>
<td>A. Identify five types of common salamanders from memory</td>
</tr>
<tr>
<td>A. Field trips, pet shops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Demonstrate feeding and proper</td>
<td>A. Students will feed and handle various types of</td>
<td>A. Teacher's evaluation</td>
</tr>
<tr>
<td>handling of salamanders</td>
<td>salamanders</td>
<td>A. Handle and feed one type of salamander</td>
</tr>
<tr>
<td>A. Demonstrate setting up living</td>
<td>A. Set up one terrarium each to house salamanders</td>
<td>A. Teacher's evaluation</td>
</tr>
<tr>
<td>quarters for salamanders and use of</td>
<td></td>
<td>A. Identify and prepare one terrarium for salamanders</td>
</tr>
<tr>
<td>equipment</td>
<td></td>
<td>from memory</td>
</tr>
<tr>
<td>A. List problems of salamanders</td>
<td>A. Students will study and recognize common problems</td>
<td>A. Teacher's evaluation</td>
</tr>
<tr>
<td>A. Texts/live specimens</td>
<td></td>
<td>A. Identify one common problem in salamanders and solve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the problem</td>
</tr>
</tbody>
</table>

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13
MODULE OF INSTRUCTION

Title - CARE AND HANDLING OF REPTILES AND AMPHIBIANS

 RESOURCE MATERIALS

Books:

The Reptile World
Clifford H. Pope
Alfred A. Knopf, New York

The Biology of the Amphibia
G. K. Noble
Dover Publications, New York

A Field Guide to Reptiles and Amphibians
Roger Conant

Our Small Native Animals: Their Habits and Care
Robert Snedigar
Dover Publications, New York

 Keeping Reptiles and Amphibia (1950)
E.J.F. Pitman
Buckley Press, Brentford, Middlesex
28. IOD.

Handbook of Turtles
A. Carr
Comstock Publ, Cornell, N.Y.

The UFAW Handbook on the Care and Management of Laboratory Animals
pub. by: E&SLivingstone LTD London

Audiovisuals:

2" by 2" kodachrome slides may be obtained from the biological supply houses such as:

Turtox Biologicals
Chicago, Ill.

Ward's Biological
Rochester, New York

Carolina Biologicals or Clay Adams

Films:

The Frog
Encyclopedia Britannica Educational Corp.
Chicago, Ill.

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The student will learn methods of identification and handling of the different types of small rodents, guinea pigs, and rabbits. Identification will include the ability to recognize the various strains of each species. The handling will include the ability to determine the sex of the animals from the newborn through the adult stages. By learning the behavioral patterns of the various animals the student will begin to develop an understanding of the animals' needs. This understanding will enable the student to select the proper methods of caging, feeding, and watering of the animal studied. The student will be able to recognize the symptoms of some of the common diseases of small animals.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification and handling of rodents</td>
<td>1 7</td>
</tr>
<tr>
<td>Sex determination of rodents</td>
<td>0 2</td>
</tr>
<tr>
<td>Identification and handling of guinea pigs</td>
<td>0 2</td>
</tr>
<tr>
<td>Identification and handling of rabbits</td>
<td>0 2</td>
</tr>
<tr>
<td>Animal behavior</td>
<td>0 6</td>
</tr>
<tr>
<td>Housing and feeding small animals</td>
<td>1 5</td>
</tr>
<tr>
<td>Disease symptoms</td>
<td>1 3</td>
</tr>
<tr>
<td></td>
<td>3 27</td>
</tr>
</tbody>
</table>

Revised August '75
MODULE OF INSTRUCTION
Title - Care and Handling of Small Animals

OBJECTIVES to be obtained:

The student will be able to:

1. Identify the 10 common strains of rats, mice, hamsters, and gerbils used as pets or laboratory animals.
2. Handle rats, mice, hamsters and gerbils in a pet store or lab setting.
3. Determine the sex when given a rodent in any stage of its development, from newborn through adult.
4. Identify the common strains or breeds of guinea pigs.
5. Handle and sex the common strains or breeds of guinea pigs.
6. Identify, handle and sex the common strains of rabbits.
7. Record behavioral patterns of the small animals being studied.
8. List the recommended equipment needed for housing small animals.
9. List the various methods of caging, feeding and watering the small animals.
10. Recognize the symptoms of 20 common diseases of small animals, and relate a cause and control for each.
Code - 01,0101010702-04
Title - Care and Handling of Small Animals

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1 - Identification and Handling of rodents</td>
<td></td>
</tr>
<tr>
<td>Objective 1</td>
<td>Identify the common strains of rats, mice, hamsters, and gerbils used as pets or laboratory animals.</td>
</tr>
<tr>
<td>Objective 2</td>
<td>Handle rats, mice, hamsters and gerbils in a pet store or laboratory setting</td>
</tr>
<tr>
<td>Unit 2 - Sex Determinations of Rodents</td>
<td></td>
</tr>
<tr>
<td>Objective 3</td>
<td>Determine the sex when given a rodent in any stage of development from newborn through adult.</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>A. Lecture - discussion</td>
<td>A. Participate in class discussion</td>
</tr>
<tr>
<td>B. Supervised study using</td>
<td>B. Take notes during lecture</td>
</tr>
<tr>
<td>references</td>
<td>C. Compile list of names of each animal and a method of identifying each in the notebook - include photographs.</td>
</tr>
<tr>
<td>A. Lecture - discussion</td>
<td>A. Take notes</td>
</tr>
<tr>
<td>B. Slide presentation - Animal</td>
<td>B. Observe demonstration</td>
</tr>
<tr>
<td>Handling Care</td>
<td>C. Practice what has been</td>
</tr>
<tr>
<td>C. Teacher demonstration</td>
<td>demonstrated</td>
</tr>
<tr>
<td>D. Supervised practice</td>
<td></td>
</tr>
<tr>
<td>E. Film strip - Safe Handling</td>
<td></td>
</tr>
<tr>
<td>of Lab Animals</td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td></td>
</tr>
<tr>
<td>B. Demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td></td>
</tr>
<tr>
<td>A. Note taking</td>
<td></td>
</tr>
<tr>
<td>B. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Practice sexing each animal</td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
</tr>
<tr>
<td><strong>Unit 3 - Identification and Handling of Guinea Pigs</strong></td>
<td>A. Use</td>
</tr>
<tr>
<td>Objective 4. Identify the common strains or breeds of guinea pigs</td>
<td>B. Particular adaptation</td>
</tr>
<tr>
<td>Objective 5. Handle and sex the common strains or breeds of guinea pigs</td>
<td>C. Color markings</td>
</tr>
<tr>
<td></td>
<td>D. Size</td>
</tr>
</tbody>
</table>

**Unit 4 - Identification and Handling Rabbits**

<p>| Objective 6. Identify, handle and sex the common strains of rabbits | A. Identification of the common strains or breeds of rabbits. |
| | B. Techniques of handling rabbits |
| | C. Sexing rabbits |
| | D. Safety |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Compile a list of the common strains of guinea pigs and note methods of identification.</td>
<td>A. Teacher's evaluation of student's ability to identify different strains of guinea pigs.</td>
</tr>
<tr>
<td>A. Teacher demonstration with live animals</td>
<td>A. Observe teacher's demonstration.</td>
<td>A. Teacher evaluation of student's ability to handle and sex guinea pigs.</td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td>B. Practice handling and sexing guinea pigs.</td>
<td></td>
</tr>
<tr>
<td>A. Demonstration with live animals.</td>
<td>A. Compile lists of common strains for identification in notebook.</td>
<td></td>
</tr>
<tr>
<td>B. Supervised study - references</td>
<td>B. Observe teacher demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice sexing rabbits.</td>
<td></td>
</tr>
</tbody>
</table>
### Objectives by Unit

#### Unit 5 - Animal Behavior

**Objective 7**
Record behavioral patterns of the small animals being studied.

#### A. Normal cage activities
- Docile
- Active
- Curious
- Nesting
- Fighting
- Breeding
- Animal's activities at night and during the day.

#### B. Effects of various stimulations
- Light
  - bright
  - prolonged
- Noise
  - sudden
  - at various frequencies
- Sudden movements
- Temperature changes
- Various odors
  - sweet
  - sour or foul
  - masking odors
  - smoke

#### C. Ability of animals to learn
- By reward
- To avoid punishment

#### Unit 6 - Housing and Feeding Small Animals

**Objective 8**
List the recommended facilities needed for housing small animals.

#### A. Building
- Sanitary
- Pest proof
- Environmental controls
- Cleaning equipment

#### B. Room sizes

#### C. Walls and floors
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture - discussion</td>
<td>A. Note taking</td>
<td>A. Teacher evaluation of student's record of behavioral patterns.</td>
</tr>
<tr>
<td>B. Prepare laboratory setting</td>
<td>B. Use mimeo as a guide</td>
<td>B. Teacher evaluation of student's ability to recognize normal and abnormal types of behavioral.</td>
</tr>
<tr>
<td>C. Prepare mimeo of items to be observed</td>
<td>C. Study and record behavioral patterns.</td>
<td></td>
</tr>
<tr>
<td>D. Supervised laboratory study</td>
<td>D. Observe the learning abilities and classify the animals observed.</td>
<td></td>
</tr>
<tr>
<td>E. Laboratory exercises to determine the effects of the various stimulations on the animals, designed to test each stimulation separately and in combination.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Laboratory exercises using various training devices, maze, skinner box, to determine the animals ability to learn.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Keeping records on the laboratory exercises.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervisory study</td>
<td>A. Prepare information and pictures for notebook.</td>
<td></td>
</tr>
<tr>
<td>B. Class discussion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### OBJECTIVES BY UNIT

**Objective 9**
List the various methods of caging, feeding, and watering small animals.

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Cage size requirements for different animals</td>
</tr>
<tr>
<td>B. Types of cages</td>
</tr>
<tr>
<td>• Shoebox</td>
</tr>
<tr>
<td>• Wire basket</td>
</tr>
<tr>
<td>• Cage materials</td>
</tr>
<tr>
<td>• plastic or glass</td>
</tr>
<tr>
<td>• metal</td>
</tr>
<tr>
<td>• wood</td>
</tr>
<tr>
<td>C. Types of bedding</td>
</tr>
<tr>
<td>• For incage use</td>
</tr>
<tr>
<td>• For dropping pans</td>
</tr>
<tr>
<td>D. Types of feeding and watering devices</td>
</tr>
<tr>
<td>E. Feeding and watering requirements of the different small animals</td>
</tr>
</tbody>
</table>

### Unit 7 - Disease Control

**Objective 10**
Recognize the symptoms of 20 common diseases of small animals and relate a cause and control to each.

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Causes</td>
</tr>
<tr>
<td>B. Symptoms</td>
</tr>
<tr>
<td>• Rough and starry coat</td>
</tr>
<tr>
<td>• Abnormal behavior</td>
</tr>
<tr>
<td>• Discharge about eyes or nose</td>
</tr>
<tr>
<td>• Diarrhea or messy stool</td>
</tr>
<tr>
<td>• Blood in cage and/or wounds</td>
</tr>
<tr>
<td>• Tilts head to one side</td>
</tr>
<tr>
<td>• off balance or spins in circles</td>
</tr>
<tr>
<td>• Lack of color in ears</td>
</tr>
<tr>
<td>• Abnormal growths</td>
</tr>
<tr>
<td>C. Controls</td>
</tr>
<tr>
<td>D. Safety - handler</td>
</tr>
</tbody>
</table>
### Care and Handling of Small Animals

<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in discussion</td>
<td>A. Teacher evaluation of notes.</td>
</tr>
<tr>
<td>B. Field trips</td>
<td>B. Compile and record notes on various methods of caging, feeding and watering small animals.</td>
<td>B. Oral or written test.</td>
</tr>
<tr>
<td>C. Supervised study</td>
<td></td>
<td>C. Cage requirements and types of cage bedding, watering and feeding mechanisms.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>D. Food requirements</td>
</tr>
<tr>
<td>A. Class discussion</td>
<td></td>
<td>A. Teacher's evaluation of student's listing</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>A. Participate in class discussion.</td>
<td>B. Oral or written test.</td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>B. Compile list of causes, symptoms, and controls of 40-50 diseases for future references.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Prepare program for disease prevention.</td>
<td></td>
</tr>
</tbody>
</table>

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MODULE OF INSTRUCTION

Title - Handling Small Animals

RESOURCE MATERIALS

Books:
The UFAW Handbook
Care and Management of Laboratory Animals
Edited by staff of UFAW
3rd edition
E. & S. Livingstone LTD
England $22.00

The I.A.T. Manual of Laboratory Animal Practice and Techniques
D. J. Short & D. P. Woodnott
2nd edition
Charles C. Thomas
Springfield, Illinois $14.00

Raising Laboratory Animals
James Silvan
The Natural History Press
Garden City, N.Y. $1.45

Manual for Laboratory Animal Technicians
Publication 67-3
American Association for Animal Science
Joliet, Illinois $3.00

Periodicals:
Laboratory Animal Digest
Ralston Purina Co.
St. Louis, Missouri

Audiovisuals: Films
Handling Laboratory Animals
American Association for Laboratory Animal Science
Joliet, Illinois

Care of Laboratory Animals (filmstrip)
National Medical Audiovisual Center
Chamblee, Georgia

Using Animals in the Laboratory (filmstrip)
National Medical Audiovisual Center
Chamblee, Georgia

Safe Handling of Laboratory Animals
National Medical Audiovisual Center
Chamblee, Georgia
2" x 2" K dachromes
Animal Handling and Care
(Now in Process by American Association for Laboratory Animal Science)
Joliet, Illinois

Code - 01.0101010702-04

12 273
TITLE - HANDLING OF PRIMATES

DESCRIPTION:

The student will learn methods to identify and handle the different species of primates. The identification will include the species classification, the sex of the animal and the methods of tattooing or marking the individual animals. The handling will include the use of the various types of cages, nets, protective clothing and other devices used in safely restraining primates. The student will begin to develop an understanding of the needs of primates. This understanding will enable the student to learn caging, feeding and watering and cleaning of the primates. The student will be made aware of the common diseases of primates.

MAJOR DIVISIONS OR UNITS OF CONTENT

1. Types
2. Conditioning
3. Handling
4. Care and Sanitation
5. Diseases

<table>
<thead>
<tr>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
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</tr>
</tbody>
</table>

Revised August 1975
OBJECTIVES to be obtained:

The student will be able to:

1. Identify without reference 12 different classes of primates and determine the sex of 6 different primate animals.

2. Tattoo or mark the individual primates for identity and perform job necessary for receiving new animals.

3. Use restriction equipment to capture and restrain a primate without causing injury.

4. Feed and water the different species of primates.

5. Maintain sanitary conditions of the primate quarters.

6. List 30 common diseases of primates and prepare a record of causes, symptoms and controls for 20 of these.
### Objectives by Unit

| Unit 1 - Types | A. Identification  
|               |   A. Species  
| Objective 1   |   B. Sex  
| Identify without reference 12, different classes of primates and determine the sex of 6 different primate animals. | B. Native homes  
|               |   A. Origin  
|               |   B. Migration |

| Unit 2 - Conditioning | A. Procurement  
| Objective 2 |   A. Direct import  
| Tattoo or mark the individual primates for identity and perform job necessary for receiving new animals. | B. Breed in captivity  
|               |   C. Handling upon arrival |

| Unit 3 - Handling | A. Squeeze cage  
| Objective 3 | B. Nets  
| Use restriction equipment to capture and restrain a primate without causing injury. | C. Chains  
|               | D. Tranquilizing or anesthesia  
|               | E. Hand catching  
|               |   A. Grips  
|               |   B. Oral medication  
|               |   C. Tattooing  
|               |   D. Blood drawing  
|               |   E. Other procedures  
|               | F. Safety  

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture discussion</td>
<td>A. Compile notes-list of classes and species</td>
<td>A. Teacher evaluation of students ability to determine sex.</td>
</tr>
<tr>
<td>B. Teacher demonstrations</td>
<td>B. Observe demonstration</td>
<td>B. Oral or written test</td>
</tr>
<tr>
<td>C. Supervised study</td>
<td>C. Sex the animals</td>
<td>List 12 classes of primates and give 2 identifying</td>
</tr>
<tr>
<td>D. Film-Survey of Primates</td>
<td></td>
<td>characteristics of each</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A. Teacher evaluation of students ability to apply tattoo and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>prepare for new arrivals</td>
</tr>
<tr>
<td>A. Teacher demonstration in isolation room</td>
<td></td>
<td>A. Teacher evaluation of students ability</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td></td>
<td>to restrain animals</td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Teacher demonstration of various types of equipment</td>
<td>A. Observe teacher demonstrations</td>
<td>A. Teacher evaluation of students ability</td>
</tr>
<tr>
<td>B. Teacher demonstration of the various grips and procedures used</td>
<td></td>
<td>to restrain animals</td>
</tr>
<tr>
<td>C. Teacher demonstration of various procedures using live animals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Supervised practice on models and live animals</td>
<td></td>
<td></td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 4 - Care and Sanitation</td>
<td></td>
</tr>
<tr>
<td>Objective 4</td>
<td>A. Basic Nutrition</td>
</tr>
<tr>
<td>Feed and water the different species of primates</td>
<td>- Foods used by primates</td>
</tr>
<tr>
<td></td>
<td>- Nutrients available in these foods</td>
</tr>
<tr>
<td></td>
<td>- Nutritional needs of primates</td>
</tr>
<tr>
<td></td>
<td>(NOTE: this is not a unit in nutrition)</td>
</tr>
<tr>
<td></td>
<td>B. Feeding</td>
</tr>
<tr>
<td></td>
<td>- Labeling particular foods for particular animals</td>
</tr>
<tr>
<td></td>
<td>- Measuring amount to be fed</td>
</tr>
<tr>
<td></td>
<td>- Schedule</td>
</tr>
<tr>
<td></td>
<td>- Record of feeding</td>
</tr>
<tr>
<td></td>
<td>C. Watering</td>
</tr>
<tr>
<td></td>
<td>- Periodic</td>
</tr>
<tr>
<td></td>
<td>- Free water</td>
</tr>
<tr>
<td>Objective 5</td>
<td></td>
</tr>
<tr>
<td>Maintain sanitary conditions of primate quarters</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit 5 - Disease Control</td>
<td></td>
</tr>
<tr>
<td>Objective 6</td>
<td>A. Infections</td>
</tr>
<tr>
<td>List 30 common diseases of primates including causes,</td>
<td>B. Contagious</td>
</tr>
<tr>
<td>symptoms and controls of each</td>
<td>C. Contagious to humans</td>
</tr>
<tr>
<td></td>
<td>D. Prevention</td>
</tr>
<tr>
<td></td>
<td>E. Symptoms</td>
</tr>
<tr>
<td></td>
<td>- Lesions and wounds</td>
</tr>
<tr>
<td></td>
<td>- Mouth and tongue</td>
</tr>
<tr>
<td></td>
<td>- Superficial cuts or abrasions</td>
</tr>
<tr>
<td></td>
<td>- Bites</td>
</tr>
<tr>
<td></td>
<td>- Stool and urine specimens</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>----------------------------------------------------</td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Note taking--list of foods categorized to animals</td>
</tr>
<tr>
<td>B. Demonstration by teacher</td>
<td>B. Observe demonstration</td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice feeding and watering primates</td>
</tr>
<tr>
<td>D. Field trip to zoo or pet store</td>
<td></td>
</tr>
<tr>
<td>A. Lecture--discussion</td>
<td>A. Note taking</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Prepare a list of procedures to follow for daily sanitation</td>
</tr>
<tr>
<td>C. Demonstration of procedures</td>
<td>C. Prepare a list of sanitation for new arrivals</td>
</tr>
<tr>
<td>D. Supervised practice</td>
<td>D. Observe demonstration</td>
</tr>
<tr>
<td>E. Field trip</td>
<td>E. Practice demonstrated techniques</td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Compile a list of causes, symptoms and controls for each disease reported</td>
</tr>
<tr>
<td>Set up students in groups with responsibility for a set number of diseases to each group. Let the group report their information to the class.</td>
<td>B. Discuss problems to speakers</td>
</tr>
<tr>
<td>B. Guest speaker-veterinarian</td>
<td></td>
</tr>
</tbody>
</table>
C. Periodicals -

Laboratory Animal Digest
Ralston Purina Co
St. Louis, Missouri

Laboratory Primate Newsletter
Psychology Department
Brown University
Providence, Rhode Island

D. Audiovisuals

Films
Survey of the Primates
Appleton Century Crafts Film Library
New York (rental $30.00)

The Rhesus Monkeys of Santiago Island, Puerto Rico
National Medical Audiovisual Center
Chamblee, Georgia

Characteristics of Gibbon Behaviour
Psychological Cinema Register
Audio-Visual Aids Library
Pennsylvania State University
University Park, Penn.

Behavioral Characteristics of the Rhesus Monkey
Psychological Cinema Register
Audio-Visual Aids Library
Pennsylvania State University
University Park, Penn.
MODULE OF INSTRUCTION

Title - INTERNAL PARASITES OF ANIMALS

Code - 01.0101010703-01

DESCRIPTION:

The student will learn to identify the numerous internal parasites of animals. Students will learn the techniques used for the preparation of specimens for studying the intestinal or blood parasites using a microscope, and for identification of most parasitic infections. The student will learn the simple staining procedures used in the identification of some parasites, and to identify the parasite by use of the ex, cyst, larvae or adult morphology. The student will learn methods of collecting and transporting specimens for parasitic-analysis.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Collection and Transportation of Specimens</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2. Identification of Parasitic Nematodes</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>3. Identification of Cestodes and Trematodes</td>
<td>0</td>
<td>6</td>
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<tr>
<td>4. Identification of Parasitic Protozoa</td>
<td>1</td>
<td>10</td>
</tr>
</tbody>
</table>

August '75
MODULE OF INSTRUCTION

Title - Internal Parasites of Animals  

OBJECTIVES to be obtained:

The student will be able to:

1. Collect specimens from animals for parasitic analysis.

2. List the proper methods of transporting specimens including mailing regulations.

3. Prepare specimens for parasitic analysis using direct smears, flotation, and sedimentation concentration techniques.

4. Stain smears using Giemsa, Wright's Iodine or Trichrome stains.

5. Properly use a microscope.

6. Identify the common Nematodes (roundworms) of animals based upon the adult, larvae, or egg stages.

7. Identify the common Cestodes (tapeworms) of animals based upon the adult, larvae, or egg stages.

8. Identify the common Trematodes (flukes) of animals based upon the adult and egg stages.

9. Identify the common parasitic Protozoa of animals based upon the trophozoite or cysts stages.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 1 - Collection and Transportation of Specimens** | A. Collecting specimens samples
- Fecal
- Urine
- Blood
- Tissue |
| **Objective 1** | **Collect specimens from animals for parasitic analysis.** |
| **Objective 2** | **List the proper methods of transporting specimens including mailing regulations.** |
| **Objective 3** | **Prepare specimens for parasitic analysis using smears, flotation, and sedimentation concentration techniques.** |

<table>
<thead>
<tr>
<th>A. Transportation of specimens</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Short distances</td>
</tr>
<tr>
<td>- Long distances</td>
</tr>
<tr>
<td>- mailing specimens</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Simple concentration techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Direct smears</td>
</tr>
<tr>
<td>- Flotation methods</td>
</tr>
<tr>
<td>- Sedimentation methods</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Supervised study</td>
</tr>
<tr>
<td>B. Teacher demonstration</td>
</tr>
<tr>
<td>C. Movies</td>
</tr>
<tr>
<td>D. Laboratory exercises</td>
</tr>
<tr>
<td>A. Teacher-student discussion</td>
</tr>
<tr>
<td>B. Invite resource person to class to discuss transportation methods and techniques.</td>
</tr>
<tr>
<td>C. State and Federal regulations.</td>
</tr>
<tr>
<td>A. Laboratory demonstrations</td>
</tr>
<tr>
<td>B. Laboratory exercises</td>
</tr>
<tr>
<td>C. Slides</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td>Objective 4</td>
<td>A. Staining techniques</td>
</tr>
<tr>
<td></td>
<td>. For intestinal protozoa</td>
</tr>
<tr>
<td></td>
<td>. iodine</td>
</tr>
<tr>
<td></td>
<td>. trichrome</td>
</tr>
<tr>
<td></td>
<td>. Blood smears</td>
</tr>
<tr>
<td></td>
<td>. Wrights stain</td>
</tr>
<tr>
<td></td>
<td>. Giemsa stain</td>
</tr>
<tr>
<td>Objective 5</td>
<td>A. The parts of a microscope</td>
</tr>
<tr>
<td></td>
<td>B. Adjusting the microscope</td>
</tr>
<tr>
<td></td>
<td>. Low power</td>
</tr>
<tr>
<td></td>
<td>. High power</td>
</tr>
<tr>
<td>Objective 6</td>
<td>C. Preparing slides</td>
</tr>
<tr>
<td></td>
<td>A. Intestinal nematodes</td>
</tr>
<tr>
<td></td>
<td>. Identification stages</td>
</tr>
<tr>
<td></td>
<td>. adult</td>
</tr>
<tr>
<td></td>
<td>. egg</td>
</tr>
<tr>
<td></td>
<td>. larvae</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Teacher demonstrations</td>
<td>A. Notes on laboratory exercises</td>
</tr>
<tr>
<td>B. Students laboratory exercises</td>
<td></td>
</tr>
<tr>
<td>A. Demonstrations</td>
<td>A. Student notes</td>
</tr>
<tr>
<td>B. Microscope charts</td>
<td>B. Student skill development using the microscope.</td>
</tr>
<tr>
<td>C. Laboratory exercises</td>
<td></td>
</tr>
<tr>
<td>A. Demonstrations</td>
<td>A. Laboratory exercises in identification of common common parasitic nematodes.</td>
</tr>
<tr>
<td>B. Laboratory exercises</td>
<td></td>
</tr>
<tr>
<td>C. Teacher - student discussions</td>
<td></td>
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</table>
### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 3 - Identification of Cestodes and Trematodes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 7</strong></td>
</tr>
<tr>
<td>Identify the common cestodes (tapeworms) of animals based upon the adult, larvae, or egg stages.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 4 - Identification of Parasitic Protozoa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 8</strong></td>
</tr>
<tr>
<td>Identify the common trematodes (flukes) of animals based upon the adult, and egg stages.</td>
</tr>
<tr>
<td><strong>Objective 9</strong></td>
</tr>
<tr>
<td>Identify the common parasitic protozoa of animals base upon the trophozoite or cysts stages.</td>
</tr>
</tbody>
</table>

**CONTENT**

**A. Identification of cestodes (tapeworms)**
- Adult stages
- Egg stages
- Larvae stages

**A. Identification of intestine protozoa**
- Amebae
- Flagellates
- Ciliate
- Sporozoan

**B. Identification of protozoa found in the blood**
- Flagellates
- Sporozoan

**A. Identification of common parasitic protozoa**
- Cysts stages

---

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### TEACHING METHODS

| A. Supervised study |
| B. Film strips and slides |
| C. Movies |
| D. Teacher/student discussion |

### STUDENT APPLICATION ACTIVITIES

| A. Notes on supervised study period, slides, movies and class discussion |
| A. Identify the common trematodes (flukes) of domestic and laboratory animals |
| A. Students sketch types of protozoa based on cyst stages |
| B. Prepare slides for visuals |

### EVALUATION PROCEDURES

| A. Test on laboratory exercises |
| A. Test on laboratory exercises |
| A. Laboratory exercise test Identification of common parasitic protozoa of domestic and laboratory animals |

---

**Internal Parasites of Animals** - Title

---

**STUDENT APPLICATION ACTIVITIES**

1. Notes on supervised study period, slides, movies and class discussion.
2. Identify the common trematodes (flukes) of domestic and laboratory animals.
3. Students sketch types of protozoa based on cyst stages.
4. Prepare slides for visuals.

---

**EVALUATION PROCEDURES**

1. Test on laboratory exercises.
2. Notebook grade.
3. Laboratory exercise test: Identification of common parasitic protozoa of domestic and laboratory animals.
TITLE - Internal Parasites of Animals

RESOURCE MATERIALS

Books:

Veterinary Clinical Parasitology
Margaret W. Sloss
4th edition
Iowa State University Press
Ames, Iowa

How to Know the Tapeworms
Gerald D. Schmidt
Wm. C. Brown Company
Dubuque, Iowa

Veterinary Helminthology
Angus M. Dunn
Lea & Febiger
Philadelphia

Animals Parasitic in Man
Geoffrey Lapage
Dover Publications
New York

Periodicals:

Laboratory Animal Digest
Ralston Purina Co.
St. Louis, Missouri

Audiovisuals:

The following films can be obtained from:
National Medical Audiovisual Center (Annex)
Chamblee, Georgia 30005

M-115 Ancylostoma caninum in the intestine of the dog
Collection of fecal specimens F-81
M-761 Formalin-Ether Sedimentation Technique
5-073 Hookworm disease and hookworm infection
4-059 Infection larvae of Wuchereria bancrofti

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TITLE - Internal Parasites of Animals

RESOURCE MATERIALS (cont'd)

Audiovisuals (cont'd)

5-155 The Preparation of Hematoxylin stained smears for the diagnosis of intestinal protozoa
5-153 PVA - fixative technique in the diagnosis of amebiasis
5-095 Worms in your muscles

Ancylostoma: Life history of hookworms

Parasitism (Parasitic Flat Worms)
Encyclopedia Britannica Educational Corp.
Chicago, Illinois

The World Within
Extension Media Center
University of California
Berkeley, California

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Title - External Parasites of Animals

Description:

The student will learn to identify the external parasites and pests of animals and their quarters. Emphasis will be placed on identification and control of the vermin infesting the animals and their quarters. Various techniques for the collecting and preparation of the specimens will be taught. The life cycles of the vermins will be covered in order for the student to have a better understanding of prevention and control methods.

The student will learn to treat, prevent, and control the common vermin problem of animals.

Major Divisions or Units of Content

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Collection and Preparation of Specimens</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2. Identification of Ticks and Mites</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>3. Identification of Fleas and Lice</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>4. Identification of Pests of Animal Quarters and Feeds</td>
<td>0</td>
<td>8</td>
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<tr>
<td></td>
<td>2</td>
<td>28</td>
</tr>
</tbody>
</table>

Revised August '75
MODULE OF INSTRUCTION

Title: External Parasites of Animals

OBJECTIVES to be obtained:

The student will be able to:

1. Collect 25 different external parasites from both living and dead animals using common procedures.

2. Prepare the specimens including clearing and mounting on slides for identification.

3. Distinguish the differences between the hard and soft ticks and identify 10 common ones found on animals.

4. Recognize 10 of the common mites found on animals.

5. Identify 15 common fleas.

6. Identify 8 common chewing and sucking lice.

7. List and identify 20 common pests of animal quarters and feeds.

8. List the symptoms and methods to control 10 of the common pests of animal quarters.

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<table>
<thead>
<tr>
<th>OBJECTIONS BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 1 - Collection and Preparation of Specimens** | A. Collection of specimens  
- Living animals  
  - birds  
  - mammals  
  - reptiles  
- Dead animals  
  - cold method  
  - bathing  
  - combing  
  - digestion method |
| **Objective 1** | Prepare the specimens, including clearing and mounting on slides for identification. |
| **Objective 2** | A. Preparation  
  - Clearing  
  - Mounting |
| **Unit 2 - Identification of Ticks and Mites** | A. Ticks  
- Soft  
- Hard |
| **Objective 3** | Collect 25 different external parasites from both living and dead animals using common procedures. |
| | Distinguish the differences between the hard and soft ticks, and identify the 10 common ones found on animals. |
### TEACHING METHODS

<table>
<thead>
<tr>
<th>A. Class discussion</th>
<th>B. Demonstration by the instructor</th>
<th>C. Supervised practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Demonstration by the instructor of techniques to be used.</td>
<td>B. Supervised practice</td>
<td></td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

A. Collect specimens from both living and dead animals.

- B. Participate in class discussion.

### EVALUATION PROCEDURES

A. Teacher's evaluation of student's ability to collect insects specimens.

<table>
<thead>
<tr>
<th>A. Participate in class discussion.</th>
<th>B. Practice preparation of insects.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Participate in discussion.</td>
<td>B. Compile notes</td>
</tr>
<tr>
<td>A. Practice in discussion.</td>
<td>B. Oral or written test using real specimens for identification.</td>
</tr>
<tr>
<td>A. Teacher's evaluation of student's ability to differentiate between soft and hard ticks.</td>
<td></td>
</tr>
<tr>
<td>B. Observe demonstration</td>
<td>D. Practice identification procedure.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>C. Observe demonstration</th>
<th>D. Practice identification procedure.</th>
</tr>
</thead>
</table>

- A. Supervised study using references
  - Pictorial keys
  - A manual for external parasites

<table>
<thead>
<tr>
<th>C. Demonstrate methods of identification of each using a key.</th>
<th>D. Supervised practice</th>
</tr>
</thead>
</table>

#### Additional Notes

- A. Collect specimens from both living and dead animals.

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 2</strong>&lt;br&gt;Objective 4&lt;br&gt;Recognize 10 of the common mites found on animals.</td>
<td>A. Mites</td>
</tr>
<tr>
<td><strong>Unit 3</strong> - Identification of Fleas and Lice&lt;br&gt;Objective 5&lt;br&gt;Identify 15 common fleas</td>
<td>A. Fleas</td>
</tr>
<tr>
<td>Objective 6&lt;br&gt;Identify 8 common chewing and sucking lice.</td>
<td>A. Chewing&lt;br&gt;  . Mouth parts&lt;br&gt;  . Area of infestation&lt;br&gt; B. Sucking&lt;br&gt;  . Mouth parts&lt;br&gt;  . Area of infestation</td>
</tr>
</tbody>
</table>

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## External Parasites of Animals

<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and class discussion</td>
<td>A. Participate in discussion</td>
<td>Teacher's evaluation of student's ability to identify mites.</td>
</tr>
<tr>
<td>B. Supervised study using Pictorial keys</td>
<td>B. Compile notes</td>
<td>A. Oral or written test - list 15 common fleas.</td>
</tr>
<tr>
<td>C. A manual for external parasites</td>
<td>C. Observe demonstration</td>
<td>B. Teacher's evaluation of student's ability to identify 15 common fleas.</td>
</tr>
<tr>
<td></td>
<td>D. Practice identification procedure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Mount specimens</td>
<td></td>
</tr>
<tr>
<td>C. Guest speaker - local veterinarian</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| | | |
| | | |

A. Class discussion
B. Supervised study of types
C. Mimeo of names of common fleas.
D. Demonstration of identification techniques.
E. Supervised practice

A. Participate in class discussion
B. File mimeo in notebook
C. Observe demonstration
D. Practice identification procedure
E. Mount specimens

A. Lecture and discussion
B. Supervised study of types.
C. Demonstration of identification.
D. Guest speaker - local veterinarian
E. Supervised practice identifying each.

A. Compile notes
B. Practice identification procedure
C. Keep a record of each specimen identified.
D. Mount specimens

Oral or written test identifying 8 chewing and sucking insects from real specimens, or slide specimens.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 4 - Identification of Pests of Animal Quarters and Feeds</strong></td>
<td><strong>A. Insects of animal quarters</strong></td>
</tr>
</tbody>
</table>
| **Objective 7** | - Roaches  
- Beetles  
- Bugs  
- Wild rodents  
  - signs  
  - controls |
| **Objective 8** | **B. Rodents** |
| **List the symptoms and methods to control 10 of the common pests of animal quarters.** | - Traps  
- Insecticides  
- Baits  
- Cleanliness  
  - Natural predators  
  - Cleanliness |
External Parasites of Animals

**TEACHING METHODS**

<table>
<thead>
<tr>
<th>A. Class discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Guest speaker from pest control company</td>
</tr>
<tr>
<td>C. Demonstration of identification of signs of pests</td>
</tr>
<tr>
<td>D. Field trip to housing facility</td>
</tr>
</tbody>
</table>

**STUDENT APPLICATION ACTIVITIES**

| A. Participate in class discussion |
| B. Compile notes from guest speaker |
| C. Identify pests of animal quarters |
| D. Participate in field trip |

<table>
<thead>
<tr>
<th>A. Class discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Field trip to housing facility</td>
</tr>
</tbody>
</table>

| A. Participate in class discussion |
| B. Compile notes on symptoms of pests |
| C. Solve problems of control of pests |
| D. Participate in field trip |
| E. Prepare a plan for pest control |

**EVALUATION PROCEDURES**

Teacher's evaluation of student's list and his ability to identify real specimens of 20 different pests of animal quarters and feeds.

Teacher's evaluation of student plan for pest control for housing and feed facilities.
TITLE - External Parasites of Animals

RESOURCE MATERIALS

Books:
- Medical Entomology
  U.S. Naval Medical School
  U.S. Government Printing Office
  Washington, D.C.
- Pictorial Keys
  Arthropods, Reptiles, Birds and Mammals of Public Health Significance
  U.S. Department of Health, Education and Welfare
  Communicable Disease Center
  Atlanta, Georgia
- A Manual of External Parasites
  H. E. Ewign
  Charles C. Thomas
  Springfield, Illinois
- Helminths, Arthropods and Protozoa of Domesticated Animals
  E.J.L. Soulsby
  Williams and Wilkins Co.
  Baltimore, Maryland

Periodicals:
- Laboratory Animal Care
  Official Publication of the American Association of Laboratory Animal Science
  Joliet, Illinois
- Laboratory Animal Digest
  Ralston Purina Co.
  St. Louis, Missouri

Audiovisuals:
- Arthropods of Public Health Importance
  National Medical Audiovisual Center
  Chamblee, Georgia
- Biology and Control of Cockroaches
  National Medical Audiovisual Center
  Chamblee, Georgia
MODULE OF INSTRUCTION

Title - Emergency Care of Animals

DESCRIPTION:

The student will learn to administer first aid to an animal which has been hurt and suffering from shock, bites or wounds, poisonous snake or insect bites, infested or infected by ticks or maggots, or poison. The student will also be able to take the body temperature and respiration of a sick animal. Part of his training will be devoted to recognizing outward signs of sickness such as changes in behavior and body coats. The student will learn how to isolate a sick animal from others and maintain proper care for all the animals without danger of infection from the isolated animal. The student will also learn some of the methods used to prevent infections and infestation in animals.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Class Other</td>
</tr>
<tr>
<td>1. Handling Sick or Injured Animals</td>
<td>0 5</td>
</tr>
<tr>
<td>2. First Aid to Animals</td>
<td>2 10</td>
</tr>
<tr>
<td>3. Disease Recognition</td>
<td>0 9</td>
</tr>
<tr>
<td>4. Disease Prevention and Control</td>
<td>1 3</td>
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<tr>
<td></td>
<td>3 27</td>
</tr>
</tbody>
</table>

Revised August '75
OBJECTIVES to be obtained:
The student will be able to:

1. Restrain and handle an ill or injured animal procedures safe to both the animal and handler.
2. Administer first aid to an animal suffering from shock, cut or a bite, or suffering from a foreign body in the mouth, skin or rectum.
3. Administer procedures to relieve an animal suffering from or harboring ticks or maggots.
4. Administer first aid (splint) for a broken bone or bad sprain in an animal.
5. Administer first aid to an animal which has been bitten by a poisonous snake or insect.
6. Apply procedures or a remedy to assist an animal which has been poisoned.
7. Recognize changes in the animals appearance, and behavior.
8. Without error, take an animals temperature.
9. Check and analyze an animals reflexes.
10. Apply preventative procedures to diseased animals by properly isolating sick animals.
11. Observe and select symptoms of an animal routinely to watch for and prevent the spread of diseases.
12. Follow routine treatment procedures to prevent the start or spread of diseases.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 1 - Handling Sick or Injured Animals** | **A. Simple forms of restraint**  
  . Personal approach  
  . Physical devices  
    . dogs  
    . cats  
    . rodents  
    . guinea pigs  
    . rabbits  
    . birds  

**B. Chemical forms of restraint**  
  . Injectables  
    . judgment for use  

**C. Safety precautions**  
  . Animal attack  
  . Contagious infections  
  . Animal injury  |

| Objective 1  
Restrain and handle an ill or injured animal using procedures safe to both the animal and handler.  |

| **Unit 2 - First Aid to Animals** | **A. Shock treatment - emergency**  
  . Heat stroke  
  . Accidents  
    . fights with other animals  
    . struck by vehicle  
    . inhumane treatment  
    . Foreign bodies  
    . Burns  

**Objective 2**  
Administer first aid to an animal suffering from shock, cut or a bite, or suffering from a foreign body in the mouth, skin, or rectum.  |

**Objective 3**  
Administer procedures to relieve an animal suffering from or harboring ticks or maggots.  

**A. Ticks**  
  . Physical removal  
  . Chemical removal  

**B. Maggots** |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Note taking</td>
<td>A. Teacher evaluation of student ability to use simple</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>B. Participate in class discussion.</td>
<td>restraint techniques.</td>
</tr>
<tr>
<td>C. Supervised study with references.</td>
<td>C. Practice simple forms of restraint demonstrated.</td>
<td></td>
</tr>
<tr>
<td>D. Guest speaker - Lab animal handler.</td>
<td>D. Practice whenever possible forms of chemical restraint.</td>
<td></td>
</tr>
<tr>
<td>E. Demonstration of simple forms of restraint.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Supervised practice</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| A. Supervised study                   | A. Note taking from study                            | A. Teacher evaluation of student ability to administer      |
| B. Class discussion                   | B. Observation of demonstration.                      | emergency treatment for accidents and shock.                 |
| C. Guest speaker -- veterinarian       | C. Practice emergency treatment demonstrated.         |                                                            |
| D. Demonstration                      |                                                      |                                                            |
| E. Supervised practice                |                                                      |                                                            |

| A. Supervised study                   | A. Note taking                                       | A. Teacher evaluation of student ability to relieve an animal of ticks or maggots. |
| B. Demonstration                      | B. Observation of demonstration.                      |                                                            |
| C. Supervised practice                | C. Practice procedures of removing ticks and maggots. |                                                            |
### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 4</td>
<td><strong>Administer first aid (splint) for a broken bone or bad sprain in an animal.</strong></td>
</tr>
<tr>
<td>Objective 5</td>
<td><strong>Administer first aid to an animal which has been bitten by a poisonous snake or insect.</strong></td>
</tr>
<tr>
<td>Objective 6</td>
<td><strong>Apply procedures or a remedy to assist an animal which has been poisoned.</strong></td>
</tr>
</tbody>
</table>

#### A. Skeletal
- **Leg bones**

#### B. Splints
- Wooden
- Inflatable
- Metal

#### Mobility of injured animal

#### Objective 5

- **Snake bites**
  - Tourniquet
  - Antidote
- **Insect bites**
  - Antidotes

#### Objective 6

- **Symptoms**
  - Temperature
  - Temperament
  - Alertness
- **Discovering the particular poison**
  - Relate symptoms with known poison symptoms
  - Relate with emergency need for veterinarian's diagnosis
- **Administering antidotes**
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Prepare report on splints for particular bones (foreleg or rear leg).</td>
<td>A. Teacher evaluation of student techniques of applying splints.</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>B. Practice applying splint to broken bone as demonstrated.</td>
<td></td>
</tr>
<tr>
<td>C. Guest speaker - veterinarian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Demonstration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Supervised practice</td>
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</tbody>
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<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Compile notes</td>
<td>A. Teacher evaluation of student procedure.</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>B. Class discussion</td>
<td></td>
</tr>
<tr>
<td>C. Demonstration</td>
<td>C. Supervised study in groups of 3 or 4.</td>
<td></td>
</tr>
<tr>
<td>D. Supervised practice</td>
<td>D. Demonstration</td>
<td></td>
</tr>
</tbody>
</table>

A. Guest lecturer - veterinarian.  
B. Class discussion  
C. Supervised study in groups of 3 or 4.  
- Let one group prepare a panel discussion relating to poisonous plants and/or laws pertaining to poisoning animals through deliberate action.  
D. Supervised practice  

A. Compile notes  
- List poisonous snakes  
- List poisonous insects  
- List antidotes for each  
- Prepare a program procedure, 10 examples of poisonous snake bites, and 10 insect bites.  
B. Teacher evaluation of student program procedure to follow in emergency.  

A. Supervised study  
B. Class discussion  
C. Supervised study in groups of 3 or 4.  
- Let one group prepare a panel discussion relating to poisonous plants and/or laws pertaining to poisoning animals through deliberate action.  
D. Supervised practice  

A. Prepare report on splints for particular bones (foreleg or rear leg).  
B. Practice applying splint to broken bone as demonstrated.  

A. Supervised study  
B. Class discussion  
C. Guest speaker - veterinarian.  
D. Demonstration  
E. Supervised practice  

A. Teacher evaluation of student techniques of applying splints.  
B. Teacher evaluation of student program procedure to follow in emergency.  
C. Prepare panel discussion on laws against poisoning animals.  
D. Test listing symptoms and diagnosis of named poisons. Include plants, and prepared poisons.
<table>
<thead>
<tr>
<th>Unit 3 - Disease Recognition</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 7</td>
<td></td>
</tr>
<tr>
<td>Recognize changes in the animal's</td>
<td>A. Changes in body coat</td>
</tr>
<tr>
<td>appearances and behavior.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Behavior</td>
</tr>
<tr>
<td></td>
<td>A. Thermometer</td>
</tr>
<tr>
<td></td>
<td>B. Handling</td>
</tr>
<tr>
<td></td>
<td>A. Leg pulling</td>
</tr>
<tr>
<td></td>
<td>B. Touching eye lids</td>
</tr>
<tr>
<td></td>
<td>C. Others</td>
</tr>
</tbody>
</table>

- Objective 7: Recognize changes in the animal's appearances and behavior.
  - A. Changes in body coat
    - Sheen
    - Roughness
    - Color
  - B. Behavior
    - Sluggishness
    - Spasmodic reactions
    - Eye reaction

- Objective 8: Without error, take an animal's temperature.
  - A. Thermometer
    - Rectal
  - B. Handling

- Objective 9: Check and analyze an animal's reflexes.
  - A. Leg pulling
  - B. Touching eye lids
  - C. Others
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>A. Compile notes</td>
<td>Test on symptoms of diseases and remedy for the diagnosis.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Observe any live examples of diseases, and prepare a list of symptoms observed.</td>
<td></td>
</tr>
<tr>
<td>C. Pictures and slides if available.</td>
<td>C. Observe pictures and take notes.</td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in discussion</td>
<td>Teacher's evaluation of student's ability to take an animal's temperature.</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>B. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice taking temperatures</td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in class discussion.</td>
<td>Teacher's evaluation of student's ability analyze reflexes.</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>B. Observe discussion</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Observe demonstrated techniques.</td>
<td></td>
</tr>
<tr>
<td>D. Field trip- Animal Clinic</td>
<td>D. Practice demonstrated techniques.</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 4 - Disease Prevention and Control</td>
<td>A. Disinfecting</td>
</tr>
<tr>
<td></td>
<td>B. Isolation of animals with contagious diseases.</td>
</tr>
<tr>
<td></td>
<td>C. Isolation when entering clinic</td>
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<tr>
<td></td>
<td>D. Handling methods</td>
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<tr>
<td></td>
<td>E. Feeding procedures</td>
</tr>
<tr>
<td></td>
<td>• Cleanliness of utensils and feeder</td>
</tr>
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<td></td>
<td>F. Safety in handling</td>
</tr>
<tr>
<td>Objective 10</td>
<td>A. Categorize diseases</td>
</tr>
<tr>
<td></td>
<td>• Contagious</td>
</tr>
<tr>
<td></td>
<td>• Infections</td>
</tr>
<tr>
<td></td>
<td>• Poisons</td>
</tr>
<tr>
<td></td>
<td>• Metabolic conditions</td>
</tr>
<tr>
<td></td>
<td>• Parasites</td>
</tr>
<tr>
<td></td>
<td>• Mechanical injury</td>
</tr>
<tr>
<td>Objective 11</td>
<td>A. Prepare outline of treatment routine</td>
</tr>
<tr>
<td></td>
<td>• Handler's preparation</td>
</tr>
<tr>
<td></td>
<td>• Equipment</td>
</tr>
<tr>
<td></td>
<td>• Aseptic procedures</td>
</tr>
<tr>
<td></td>
<td>• Isolation</td>
</tr>
<tr>
<td></td>
<td>• Administering antibiotics</td>
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<tr>
<td></td>
<td>• Safety</td>
</tr>
<tr>
<td>Objective 12</td>
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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Compile notes</td>
<td>A. Teacher evaluation of outline.</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>B. Participate in discussion</td>
<td>B. Teacher evaluation of notebook.</td>
</tr>
<tr>
<td>C. Mimeo of procedures</td>
<td>C. Outline preventative procedure and proper isolation techniques.</td>
<td></td>
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<tr>
<td>D. Supervised study</td>
<td></td>
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</tr>
<tr>
<td>A. Guest speaker - Veterinarian</td>
<td>A. Compile notes</td>
<td>A. Teacher evaluation of student ability to select symptoms.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Practice observing symptoms</td>
<td>B. Teacher evaluation of student's list of categorized diseases.</td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Prepare a list of categorized diseases.</td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in class discussion</td>
<td>A. Teacher evaluation of student procedure.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Prepare outline of treatment routine.</td>
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|                                       |                                                                    |                                              |

11
Title - Emergency Care of Animals

RESOURCE MATERIALS

Books:

The Complete Book of Dog Care
L. F. Whitney
Doubleday and Co.
Garden City, New York

First Aid for Pets
L. F. Whitney 1954

Home Veterinarians Handbook
E. T. Baker

Pets
Frances N. Chrystie
Title - BATHING, DIPPING, DUSTING AND HANDLING OF WET ANIMALS

DESCRIPTION:

The student will learn to bath, dip, dust and be able to give medicated baths to various animals, primarily dogs for grooming. Each group of animals, due to their particular habits, require different chemicals and methods for the removal of ectoparasites as well as the treatment for the different type of parasites. The dipping and dusting is primarily for the removal of fleas, lice, ticks or mites. The students will also demonstrate procedures and types of medicated baths. Proper methods of ectoparasite prevention as well as treatment will be observed by students.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Bathing animals</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2. Methods of handling wet animals</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3. Dipping various animals for removal of ectoparasites or treatment of skin disorders</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>4. The reasons and problems of dusting animals</td>
<td>(\frac{1}{4})</td>
<td>26</td>
</tr>
</tbody>
</table>
OBJECTIVES to be obtained:
The student will be able to:
1. Bath laboratory animals.
2. Handle wet animals and selectively dry them with various electric dryers, when it is advisable.
3. Identify four types of ectoparasites.
4. Identify the three most common types of eczema and identify treatment of them as prescribed by a veterinarian.
5. State the insecticides and chemicals which can be used to remove ectoparasites for the different groups of animals.
6. List and use preventive steps against reinfestation of ectoparasites in animals and lab.
7. Demonstrate the methods of dusting animals and supply logical explanations for using each method.
Title - BATHING, DIPPING, DUSTING AND HANDLING OF WET ANIMALS

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Bathing animals</strong>&lt;br&gt;Objective 1&lt;br&gt;Bath laboratory animals.</td>
<td>A. Preparation of animal for bath&lt;br&gt;B. Preparation of shampoo&lt;br&gt;C. Preparation of bathing area as to water temperature&lt;br&gt;D. Towels, rubber mats in tub and on drying table&lt;br&gt;E. Types of shampoo: high oil lather, cream - Lambert Kay Company, polypeptides - Gerard-Pellham Co.</td>
</tr>
<tr>
<td><strong>Unit 2 - Methods of handling wet animals</strong>&lt;br&gt;Objective 2&lt;br&gt;Handle wet animals and selectively dry them with various electric dryers, when it is advisable.</td>
<td>A. Drying area&lt;br&gt;B. Cages/dryers&lt;br&gt;C. Brushes and combs&lt;br&gt;D. Drying dogs for grooming-electric dryers, cassette dryer&lt;br&gt;   - Hand held dryer&lt;br&gt;   - Floor dryer&lt;br&gt;   - Cage dryer</td>
</tr>
<tr>
<td><strong>Unit 3 - Dipping various animals for removal of ectoparasites and skin disorders</strong>&lt;br&gt;Objective 3&lt;br&gt;Identify four types of ectoparasites</td>
<td>A. Four types of ectoparasites&lt;br&gt;   - Ticks&lt;br&gt;   - Fleas&lt;br&gt;   - Lice&lt;br&gt;   - Mites&lt;br&gt;   List and identify and know its life cycle.</td>
</tr>
</tbody>
</table>
# TEACHING METHODS

- A. Demonstrations using text, charts, catalogs
  - Prepare dog by brushing knots and dirt out of hair
  - Place animal in tub
  - Test water temperature
  - Wet dog and apply shampoo
  - Scrub dog and rinse well so as to leave no soap
  - Towel dry dog on table with rubber mat
- B. Supervised practice

# STUDENT APPLICATION ACTIVITIES

- A. Observe demonstration
- B. Prepare a dog for a bath, use various soaps and thoroughly rinse a dog.

# EVALUATION PROCEDURES

- A. Teacher evaluation of student ability to fully prepare and bathe a dog to the satisfaction of industry standards.

---

# A. Demonstration

- Using hand held, floor and cage dryers to prepare a dog for grooming
- Use of a comb and/or a brush on the hair while drying

- B. Supervised practice

# A. Observe demonstration

- B. Practice use of the dryers and fully dry a dog for grooming.

---

# A. Lecture, charts, dittos, text, bulletins, specimens of ectoparasites.

- B. Discussion of the tick, flea, lice and mites, and the life cycle of each.

- C. Guest speaker-veterinarian.

# A. Note four types of ectoparasites and know the life cycle and habits of each.

- B. Identify each type of ectoparasite as they are found on an animal and practice finding these on a number of animals.

---

# A. Handle the various dryers and properly dry a dog to the satisfaction of the instructor.

# A. Oral or written test on student ability to identify and state life cycle of the ectoparasites.

---

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**Title** - BATHING, DIPPING, DUSTING AND HANDLING OF WET ANIMALS

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 4        | A. Three most common types of eczema  
|                    |   - Acute moist type  
|                    |   - Itchy dry type  
|                    |   - Interdigital type  |
| Objective 5        | A. Chemicals used in treating and bathing  
|                    |   - Cold blooded animals  
|                    |   - Birds  
|                    |   - Mammals  
|                    | B. Shampoos used in treating and bathing  
|                    |   - Cold blooded animals  
|                    |   - Birds  
|                    |   - Mammals  
|                    | C. Dusts used in treating and bathing  
|                    |   - Cold blooded animals  
|                    |   - Birds  
|                    |   - Mammals  
|                    | D. Dipping animals  
|                    |   - Ticks and mites  
|                    |   - Fleas and lice  
|                    |   - Skin disorders  |
| Objective 6        | A. Cleaning of lab or shop  
|                    | B. Cleaning of animals--washing and grooming  
|                    | C. Use of chemicals in cleaning and spraying  

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## TEACHING METHODS

<table>
<thead>
<tr>
<th>A. Lecture/discussion</th>
<th>A. Student will make notes on the common types of eczema and treatments as the instructor demonstrates.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Demonstrate with live</td>
<td>B. Practice each phase of the demonstrated operation.</td>
</tr>
<tr>
<td>specimens, showing the students</td>
<td></td>
</tr>
<tr>
<td>three types of eczema and discuss the treatment of each.</td>
<td></td>
</tr>
</tbody>
</table>

## STUDENT APPLICATION ACTIVITIES

| A. Supervised study.           | A. Compile notes                                                                                     | A. The student will be able to dip various animals in the right material for removal of ectoparasites to industry standards. |
| Demonstrate on the various     | B. Observe demonstrations                                                                          |                                                                                                                   |
| animals and apply insecticides | C. Laboratory exercises in dipping of the different species of animals for the removal of parasites on treatment of skin disorders. |                                                                                                                   |
| and shampoos for removal of    | D. Mixing of chemicals                                                                               |                                                                                                                   |
| ectoparasites.                 |                                                                                                      |                                                                                                                   |

## EVALUATION PROCEDURES

| A. Supervised study           | A. Compile notes                                                                                     | A. Clean the lab to the satisfaction of the instructor. |
| B. Demonstration              | B. Laboratory exercises in cleaning spraying and using chemicals and disinfectants                   |                                                                                                                   |
| C. Supervised practice using  | C. Detection of parasites                                                                            |                                                                                                                   |
| cleaning agents, removal of   |                                                                                                      |                                                                                                                   |
| fleas                        |                                                                                                      |                                                                                                                   |
### Objectives by Unit

#### Unit 4 - The reasons and problems of dusting animals

**Objective 7**
Demonstrate the methods of dusting animals and supply logical explanations for using each method.

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Dusting birds for ectoparasites</td>
</tr>
<tr>
<td>B. Dusting animals</td>
</tr>
<tr>
<td>- Methods and reasons</td>
</tr>
<tr>
<td>- Problems</td>
</tr>
<tr>
<td>- applying dusts</td>
</tr>
<tr>
<td>- animal habits</td>
</tr>
<tr>
<td>- inhalation and ingestion</td>
</tr>
<tr>
<td>- sensitivity to different species</td>
</tr>
<tr>
<td>C. Types of dusting powders</td>
</tr>
<tr>
<td>- Pulvex</td>
</tr>
<tr>
<td>- Hartz Mountain dusting powder</td>
</tr>
</tbody>
</table>
### Teaching Methods

| A. Demonstration of dusting powders on various animals. |
| B. Discussion on the process and the types of dusting powders. |

### Student Application Activities

| A. Laboratory exercises in the dusting of birds and mammals using the different powders available. |

### Evaluation Procedures

| A. Teacher's evaluation of student's ability to use various types of dusting powders. |
M O D U L E  O F  I N S T R U C T I O N

Title - BATHING, DIPPING, DRYING AND HANDLING OF WET ANIMALS

RESOURCE MATERIALS

BOOKS

UFAW Handbook
The Care and Management of Laboratory Animals-Published by E.H.S. Livingstone Ltd., London.


BULLETINS

Charles Pomeranty
Vice President - Bell Exterminating Company, New York
Title - STERILIZATION, DISINFECTION AND STERILE PACKS  Cod - 31.0101010704-01

DESCRIPTION:

The student will learn the different methods of packing and opening of sterile packs usually associated with operations. The methods of packing the different types of cloth packs and labeling of their contents will be taught. The student will learn to identify the use of a sterile pack by the instruments it contains as well as dates of sterilization without having to open the pack. The student will learn the different methods of sterilization with heat, chemicals or radiation and which methods are best used on different types of material and equipment. The student will also learn the different methods for sanitizing and disinfecting the different types of rooms.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Sterilization of Equipment</td>
<td>1</td>
</tr>
<tr>
<td>2. Sanitizing and Disinfection of Rooms</td>
<td>0</td>
</tr>
<tr>
<td>3. Preparing Sterile Packs</td>
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</tr>
<tr>
<td>4. Opening Sterile Packs</td>
<td>0</td>
</tr>
<tr>
<td>5. Handling Sterile Equipment</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

Revised August 1975
OBJECTIVES to be obtained:
The student will be able to:

1. Sterilize equipment using heat or chemical sterilization techniques.
2. Determine the proper methods for sterilizing each type of equipment.
3. Disinfect animal cages, and operating and laboratory rooms.
4. Evaluate the different types of sanitizing procedures and determine the best methods to use when given a specific area to sanitize.
5. Properly pack a sterile pack containing instruments, cloth, and rubber gloves.
6. Label sterile packs as to contents and date of sterilization.
7. Open a sterile pack using aseptic technique.
8. Remove sterile towels, drapes or sheets from a pack without contaminating them.
9. Open pre-packed sterile envelopes and remove the contents using sterile or aseptic techniques.
10. Handle sterile equipment with the use of sterile instruments.
# Sterilization, Disinfection, and Sterile Packs

## Objectives by Unit

### Unit 1 - Sterilization of Equipment

**Objective 1**
Sterilize equipment using heat or chemical sterilization techniques

- **A. Dry Heat**
  - Ovens (hot air)
  - Incineration (destroying materials)
- **B. Moist Heat**
  - Boiling
  - Live steam
  - Free flowing
  - Compressed
- **C. Chemicals**
  - Liquids
  - Gases
- **D. Radiation**

**Objective 2**
Determine the proper methods for sterilizing each type of equipment

- **A. Utensils**
  - Metal
  - Rubber
  - Plastic
  - Glass
  - Electronic
  - Thermometers
- **B. Supplies**
  - Wood
  - Cloth
  - Chemicals
  - Paper

### Unit 2 - Sanitation and Disinfection of Rooms

**Objective 2**
Disinfect animal cages, operating and laboratory rooms

- **A. Steam**
- **B. Chemical**
  - Gas
  - Liquids
- **C. Safety precautions to be observed**
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Compile notes</td>
<td>A. Teachers evaluation of students ability to sterilize with dry heat, moist heat, chemicals and radiation.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Participate in discussion</td>
<td></td>
</tr>
<tr>
<td>C. Discussion</td>
<td>C. Observe demonstrations</td>
<td></td>
</tr>
<tr>
<td>D. Demonstration</td>
<td>D. Practice demonstrated techniques</td>
<td></td>
</tr>
<tr>
<td>E. Supervised practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Lecture and discussion</td>
<td>A. Compile notes</td>
<td></td>
</tr>
<tr>
<td>B. Demonstration on techniques of sterilization</td>
<td>B. Participate in discussion</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice demonstrated techniques</td>
<td></td>
</tr>
<tr>
<td>D. Field trip to a lab setting</td>
<td>D. Participate in field trip</td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Compile notes</td>
<td>A. Teachers evaluation of students ability to sterilize utensils and supplies</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>B. Participate in discussion</td>
<td></td>
</tr>
<tr>
<td>C. Demonstration of each method</td>
<td>C. Practice demonstrated techniques</td>
<td></td>
</tr>
<tr>
<td>D. Field trip to lab during disinfecting period</td>
<td>D. Participate in field trip</td>
<td></td>
</tr>
<tr>
<td>E. Supervised practice</td>
<td>E. Practice demonstrated techniques</td>
<td></td>
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<tr>
<td></td>
<td>F. Prepare a list of safety precautions to be observed when using disinfecting techniques</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 4       | A. Evaluation  
|                   |   Types of walls, ceilings, floors  
|                   |   Types and numbers of windows, electrical outlets and the exhaust system  
|                   | B. Application  
|                   |   Ceiling-including fixtures  
|                   |   Walls-including switches, windows, thermostats  
|                   |   Floors-including drains  |
| Objective 5       | A. Folding cloth pack covers  
|                   |   Instrument trays  
|                   |   Gloves  
|                   |   Towels and covers  |
| Objective 6       | A. Types of markers  
|                   |   Use of each  
|                   | B. Position and size of label  |
| Objective 7       | A. Unfolding top cover  
|                   | B. Unfolding under cover  
|                   | C. Removal of equipment from pack  |

Unit 3 - Preparing Sterile Packs
Objective 5
Properly pack a sterile pack containing instruments and one containing cloth

Unit 4 - Opening Sterile Packs
Objective 7
Open a sterile pack using aseptic techniques
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture/discussion</td>
<td>A. Compile notes</td>
<td>A. Teachers evaluation of students lists of items.</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>A. List items to be considered in rooms.</td>
<td>B. Oral or written test on evaluation and application procedures</td>
</tr>
<tr>
<td>C. Supervised study</td>
<td>B. Sanitize a room and its contents</td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in discussion</td>
<td>A. Teachers evaluation of students packing skill</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>A. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice demonstrated procedures</td>
<td></td>
</tr>
<tr>
<td>A. Demonstration</td>
<td>A. Observe demonstration</td>
<td>A. Teachers evaluation of students ability to label a pack</td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td>B. Practice demonstrated techniques</td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in class discussion</td>
<td>A. Teachers evaluation of students ability to aseptically open a sterile pack</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>A. Observe demonstrations</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice demonstrated techniques</td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
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<tr>
<td>----------------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Unit 5 - Handling Sterile Equipment</td>
<td>A. Handling</td>
<td></td>
</tr>
<tr>
<td>Objective 8</td>
<td>. Towels</td>
<td></td>
</tr>
<tr>
<td>Remove sterile towels, drapes or sheets from a pack aseptically</td>
<td>. Drapes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Sheets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Other cloth</td>
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</tr>
<tr>
<td>Objective 9</td>
<td>A. Items included</td>
<td></td>
</tr>
<tr>
<td>Open prepared sterile envelopes and remove the contents using aseptic techniques</td>
<td>. Needles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Syringes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Sutures</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Tubing</td>
<td></td>
</tr>
<tr>
<td>Objective 10</td>
<td>A. Instruments</td>
<td></td>
</tr>
<tr>
<td>Handle sterile equipment with the use of sterile instruments</td>
<td>. Forceps</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Techniques</td>
<td></td>
</tr>
<tr>
<td>Teaching Methods</td>
<td>Student Application Activities</td>
<td>Evaluation Procedures</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Demonstration</td>
<td>A. Observe demonstration</td>
<td>A. Teachers evaluation of students' skill in aseptically removing towels, drapes and sheets from a pack</td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td>B. Practice demonstrated technique</td>
<td></td>
</tr>
<tr>
<td>A. Demonstration</td>
<td>A. Observe demonstration</td>
<td>A. Teachers evaluation of students' ability to aseptically remove contents of prepacked sterile envelopes</td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td>B. Practice demonstrated technique</td>
<td></td>
</tr>
<tr>
<td>A. Demonstration</td>
<td>A. Observe demonstration</td>
<td>A. Teachers evaluation of students' ability to handle sterile equipment with sterile instruments</td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td>B. Practice demonstrated technique</td>
<td></td>
</tr>
</tbody>
</table>
RESOURCE MATERIALS

A. Books -

Sterilization and Disinfection with Special Emphasis on Autoclave Sterilization
J.S. Beckett & P. Berman
A.T.I. Publication Division
North Hollywood, Calif.

Antiseptics, Disinfectants, Fungicides and Disinfection
C. F. Reddish et al;
Lea & Febiger
Philadelphia, Penn.

B. Bulletins -
C. Periodicals -

D. Audiovisuals -

The Unsterile Field
Davis and Geck, Division of American Cyanamid Co.
Danbury, Conn.

The Use of Surgical Instruments
Davis and Geck, Division of American Cyanamid Co.
Danbury, Conn.

Fundamental Aseptic Technics
Davis and Geck, Division of American Cyanamid Co.
Danbury Conn.

Sterilization Procedures for the Medical Office
Wyeth Film Library
Philadelphia, Pa

Chemical Disinfection
Fundamentals of Detergents
Available from: National Medical Audiovisual Center
Chamblee, Georgia
Title - ASSISTING IN SURGICAL PROCEDURES

The students will learn to assist the surgeon in the operating room from the preparation of the room for surgery through the cleaning of the instruments following the operation. This assistance will include the preparation of the surgical trays, the animals including the shaving and cleaning of the surgical area as well as the postoperative care of the animals. The students will learn to put on surgical caps, gowns and gloves without contamination. They will also learn techniques of passing instruments to the surgeon and assisting in the procedures by holding instruments, cutting sutures and cleaning the incisions. The students will also learn to give postoperative care such as taking the animal's temperature and respiration as well as giving them medications.

MAJOR DIVISIONS OR UNITS OF CONTENT

1. Preparing the operating room
2. Assisting the surgeon
3. Bandaging animals
4. Cleaning the operating room and equipment
5. Postoperative care of animals

Time Allocation

<table>
<thead>
<tr>
<th>Class</th>
<th>Other</th>
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</thead>
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<td>8</td>
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<tr>
<td>0/2</td>
<td>2/28</td>
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</tbody>
</table>
MODULE OF INSTRUCTION

Title - ASSISTING IN SURGICAL PROCEDURES

Code - 01.01010704-02

OBJECTIVES to be obtained:

The student will be able to:

1. Prepare an operating room for operations, and scrub properly for surgery.
2. Put on surgical caps and gowns using aseptic techniques.
3. Set up the surgical instruments on trays and prepare sutures and other packets within the surgical trays.
4. Prepare the surgical area of the animal for the operation.
5. Aseptically handle the instruments and pass them to the surgeon as needed.
6. Assist the surgeon by cutting sutures and cleaning the incisions.
7. Bandage the incisions of animals following surgery.
8. Clean the surgical instruments and surgical area after surgery.
9. Make the animal comfortable after surgery.
10. Take and record the animal's temperature, pulse and respiration at regular intervals.
11. Administer medications to animals orally, intermuscularly, subcutaneously, and rectally.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Preparing the operating room</strong></td>
<td></td>
</tr>
<tr>
<td>Objective 1</td>
<td>Prepare an operating room for operations, and scrub properly for surgery.</td>
</tr>
<tr>
<td>Objective 2</td>
<td>Put on surgical caps and gowns using aseptic techniques</td>
</tr>
<tr>
<td>Objective 3</td>
<td>Set up the surgical instruments on trays and prepare sutures and other packets within the surgical trays.</td>
</tr>
<tr>
<td><strong>Unit 2 - Assisting the surgeon</strong></td>
<td></td>
</tr>
<tr>
<td>Objective</td>
<td>Prepare the surgical areas of the animal for the operation.</td>
</tr>
<tr>
<td>A. Preparing the table</td>
<td></td>
</tr>
<tr>
<td>B. Adjusting the lights</td>
<td></td>
</tr>
<tr>
<td>C. Variations for different operations</td>
<td></td>
</tr>
<tr>
<td>A. Preparing oneself after scrubbing</td>
<td></td>
</tr>
<tr>
<td>B. Assisting others in preparing</td>
<td></td>
</tr>
<tr>
<td>A. Preparation of instruments</td>
<td></td>
</tr>
<tr>
<td>B. Preparation of other operating room equipment</td>
<td></td>
</tr>
<tr>
<td>A. Shaving</td>
<td></td>
</tr>
<tr>
<td>B. Washing skin</td>
<td></td>
</tr>
<tr>
<td>C. Marking surgical area</td>
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</tbody>
</table>
**TEACHING METHODS**

<table>
<thead>
<tr>
<th>A. Lecture</th>
<th>A. Class discussion</th>
<th>A. Supervised practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Class discussion</td>
<td>B. Demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td></td>
<td></td>
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</tbody>
</table>

**STUDENT APPLICATION ACTIVITIES**

<table>
<thead>
<tr>
<th>A. Compile notes</th>
<th>B. Participate in class discussion</th>
<th>C. Practice procedure outlined in lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Participate in discussion</td>
<td>B. Observe teacher demonstrations</td>
</tr>
<tr>
<td></td>
<td>C. Practice demonstrated procedures</td>
<td></td>
</tr>
</tbody>
</table>

**EVALUATION PROCEDURES**

<table>
<thead>
<tr>
<th>A. Teacher's evaluation of student's ability to prepare the operating room.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Teacher's evaluation of student's ability to put on surgical cap and gown.</td>
</tr>
<tr>
<td>A. Teacher's evaluation of student's ability to prepare instruments, trays, sutures and packets for surgery.</td>
</tr>
<tr>
<td>A. Teacher's evaluation of student's ability to shave and wash an animal for surgery.</td>
</tr>
</tbody>
</table>

**ASSISTING IN SURGICAL PROCEDURES**

<table>
<thead>
<tr>
<th>A. Compile notes</th>
<th>B. Participate in discussion</th>
<th>C. Practice procedure outlined in lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Participate in discussion</td>
<td>B. Observe teacher demonstrations</td>
</tr>
<tr>
<td></td>
<td>C. Practice demonstrated procedures</td>
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</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 5        | A. Method of grasping instruments  
|                    | B. Circulation in the operating room  
|                    | C. Passing instruments |
| Objective 6        | A. Instruments to be used  
|                    | B. Cutting procedures |
| Unit 3 - Bandaging Animals | A. Bandaging to appendages  
| Objective 7        | B. Bandaging the head  
|                    | C. Bandaging the body  
|                    | D. Use of shields to protect wounds |
| Unit 4 - Cleaning the operating room and equipment | A. Instruments and gauge  
| Objective 8        | . Count  
|                    | . Clean  
|                    | B. Cleaning the operating room  

Objective 5
Aseptically handle the instruments and pass them to the surgeon as needed.

Objective 6
Assist the surgeon by cutting sutures and cleaning the incisions.

Unit 3 - Bandaging Animals
Objective 7
Bandage the incisions of animals following surgery.

Unit 4 - Cleaning the operating room and equipment
Objective 8
Clean the surgical instruments and surgical area after surgery.
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture/demonstration</td>
<td>A. Participate in discussion</td>
<td>A. Teacher's evaluation of student's procedure of handling</td>
</tr>
<tr>
<td>B. Demonstrations</td>
<td>B. Observe demonstrations</td>
<td>instruments</td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice demonstrated techniques</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Apply for a job in this area</td>
<td></td>
</tr>
<tr>
<td>A. Field trip to clinic to observe operating procedure and demonstrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td>A. Participate in field trip</td>
<td>A. Teacher's evaluation of student's skill in cutting sutures and cleaning incisions.</td>
</tr>
<tr>
<td></td>
<td>B. Practice demonstrated techniques</td>
<td></td>
</tr>
<tr>
<td>A. Demonstrations</td>
<td>A. Observe demonstrations</td>
<td></td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td>B. Practice applying bandages</td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in class discussion</td>
<td></td>
</tr>
<tr>
<td>B. Field trip to operating room to observe</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Participate in field trip</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Take notes</td>
<td>A. Teacher's evaluation of student's ability to apply bandages</td>
</tr>
<tr>
<td></td>
<td>D. List procedures to be followed in cleaning the operating room</td>
<td></td>
</tr>
</tbody>
</table>

A. Teacher's evaluation of student's notes
B. Oral or written test on cleaning procedures of operating room.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Unit 5 - Postoperative care of animals | A. Position of animal  
B. Room temperature  
C. Observation |
| Objective 9  
Make the animal comfortable after surgery |  
| Objective 10  
Take and record the animal's temperature, pulse, and respiration at regular intervals. | A. Use of thermometer  
B. Frequency  
C. Record temperature |
| Objective 11  
Administer medications to animals orally, intermuscularly, subcutaneously, and rectally. | A. Oral  
B. Injectables  
C. Rectal  
D. Subcutaneously  
E. Intravenous |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
</table>
| A. Guest speaker-veterinarian
  B. Supervised study     | A. Prepare material or post-operative practices to comfort animal
  B. Observe actual postoperative care                                                                 | A. Teacher's evaluation of student's prepared material                                 |
| A. Lecture/discussion   | A. Participate in discussions
  B. Demonstration       |                                                                                           | A. Teacher evaluation of student's ability to take temperature, read thermometer and record information
  C. Supervised practice  | B. Observe demonstrations
                           |                                                                                           |                                                                                       |
| A. Lecture/discussion   | A. Participate in discussion
  B. Demonstrations      |                                                                                           | A. Teacher's evaluation of student's procedure in administering medication. |
  C. Supervised practices  | B. Observe demonstrations
                           |                                                                                           |                                                                                       |
                           | C. Practice demonstrating procedure                                                         |                                                                                       |

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RESOURCE MATERIALS

A. Books -

Edythe Alexader
Operating Room Techniques
C.V. Mosby Co
St. Louis, Mo.

B. Bulletins -
RESOURCES MATERIALS (cont’d)

C. Periodicals -

Preoperative and post-operative care of the laboratory dog
Norman Bleicher
Proc. anim Care Panel, 10, 5-24 1960

Laboratory Animal Care
American Association of Laboratory Animal Science
Box 10, Joliet, Ill.

D. Audiovisuals -

Films
1: Laboratory Dogs
2: Basic Dog Surgery
The above two films are supplied by
National Medical Audiovisual Center
Chamblee Georgia

1: The care and handling of surgical instruments
2: Disinfection of the skin
3: Fundamental aseptic technics
4: Gowning and gloving for surgery
5: The use of surgical instruments
6: The unsterile field - an O.R. challenge
The above films are supplied by Davis and Geck
Division of American Cyanamid Co
Film Library, Danbury, Conn.
Title - Hematology and Urine Analysis

DESCRIPTION:

The student will learn to do a complete urine analysis, consisting of tests for albumin, sugar, acetone, ketones, bile and other chemicals. In addition, microscopic examinations should include the identification of red and white blood cells, the different types of casts and tissue cells as well as the identification of the common crystals found in urine specimens. The student will also learn to count both the red and white blood cells in blood samples to determine the hemoglobin concentration in the sample. The student will learn to make and stain blood smears and identify the different types of blood cells found in the smears. The student will also learn to do sedimentation rates and hematocrits, as well as, bleeding and coagulation times.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
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<td>1. Urinalysis</td>
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<td>2. Blood Cell Counting</td>
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<tr>
<td>3. Hemoglobins</td>
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<tr>
<td>4. Hematocrit and Sedimentation Rates</td>
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<td>3</td>
</tr>
<tr>
<td>5. Reticulocyte and Platelet Counts</td>
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<td>3</td>
</tr>
<tr>
<td>6. Bleeding and Coagulation Procedure</td>
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<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1</td>
<td>29</td>
</tr>
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</table>

Revised August 1975
OBJECTIVES to be obtained:

The student will be able to:

1. Determine the presence of albumin in urine.
2. Determine the presence of sugar, acetone, ketones, bile, and other chemicals in urine.
3. Use a microscope to identify red and white blood cells in urine samples.
4. Identify casts and tissue cells in urine samples.
5. Recognize and identify the common crystals found in urine samples.
6. Count red and white blood cells in blood samples.
7. Make and stain blood smears, and determine the different types of white blood cells seen on a blood smear.
8. Determine the hemoglobin of a blood sample.
9. Determine the sedimentation rate and volume of packed cells of a given blood sample.
10. Recognize both reticulocytes and platelets on a blood smear.
11. Determine the bleeding and coagulation times.
12. Recognize abnormal or infected blood cells seen on blood smears.
### OBJECTIVES BY UNIT

#### Unit 1 - Urinalysis

**Objective 1**
Determine the presence of albumin in urine.

**Objective 2**
Determine the presence of sugar, acetone, or ketones, bile, and other chemicals in urine.

**Objective 3**
Use a microscope to identify red and white blood cells in urine samples.

**Objective 4**
Identify casts, and tissue cells in urine samples.

### CONTENT

<table>
<thead>
<tr>
<th>A. Chemical analysis</th>
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</thead>
<tbody>
<tr>
<td>. Protein</td>
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<td>. albumin</td>
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<table>
<thead>
<tr>
<th>B. Indications of analysis</th>
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</thead>
<tbody>
<tr>
<td>A. Glucose and other sugars</td>
</tr>
<tr>
<td>B. Acetone and other ketones</td>
</tr>
<tr>
<td>C. Bile</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>A. Slides</th>
</tr>
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<tbody>
<tr>
<td>B. Cover slips</td>
</tr>
<tr>
<td>C. Microscope</td>
</tr>
<tr>
<td>. Powers</td>
</tr>
<tr>
<td>. Focus</td>
</tr>
<tr>
<td>. course</td>
</tr>
<tr>
<td>. fine</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>D. Properties of red blood cell</th>
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<tr>
<td>E. Properties of white blood cell</td>
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<th>A. Casts</th>
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<th>B. Tissue</th>
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<td>TEACHING METHODS</td>
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<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td>A. Lecture</td>
</tr>
<tr>
<td>B. Supervised study</td>
</tr>
<tr>
<td>C. Demonstrate examples of each article</td>
</tr>
<tr>
<td>A. Lecture</td>
</tr>
<tr>
<td>B. Discussion</td>
</tr>
<tr>
<td>C. Supervised study</td>
</tr>
<tr>
<td>A. Lecture/discussion</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>A. Lecture/discussion</td>
</tr>
<tr>
<td>B. Field trip to animal clinic to observe procedures,</td>
</tr>
<tr>
<td>C. Prepare mimeo</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

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### Objectives by Unit

**Unit 3 - X-Ray Film Care and Developing**

**Objectives 5**
Load X-ray film into its plate, label the films prior to taking the pictures and place the plates in proper position for taking the pictures.

**Objective 6**
Mix chemical developer and fixer used in the darkroom in preparing X-ray films.

**Objective 7**
Develop and dry the X-ray films.

**Content**

<table>
<thead>
<tr>
<th>A. Loading plates</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Labeling films</td>
</tr>
<tr>
<td>C. Positioning film plates</td>
</tr>
<tr>
<td>A. Chemicals</td>
</tr>
<tr>
<td>. Developer</td>
</tr>
<tr>
<td>. Fixer</td>
</tr>
<tr>
<td>. Solutions</td>
</tr>
<tr>
<td>B. Dryers</td>
</tr>
<tr>
<td>C. Safety</td>
</tr>
<tr>
<td>A. Film preparation</td>
</tr>
<tr>
<td>B. Mixing chemicals</td>
</tr>
<tr>
<td>C. Use dryer</td>
</tr>
<tr>
<td>D. Developed product</td>
</tr>
</tbody>
</table>

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6
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture/discussion</td>
<td>A. Participate in discussion</td>
<td>A. Oral or written test, listing the materials required for the process, and preparing a step by step procedure for loading, labeling and positioning plates.</td>
</tr>
<tr>
<td>B. Field trip to Radiology Lab.</td>
<td>B. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Demonstration</td>
<td>C. Practice demonstrated</td>
<td></td>
</tr>
<tr>
<td>D. Supervised practice</td>
<td>D. Become familiar with use and care of film.</td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in class discussion</td>
<td>A. Teacher's evaluation of student's ability to use chemical and dryers properly, safely, and economically.</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>B. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice demonstrated</td>
<td></td>
</tr>
<tr>
<td>A. Demonstration</td>
<td>A. Observe demonstration</td>
<td>A. Teacher's evaluation of student's ability to develop and dry X-ray films.</td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td>B. Practice techniques demonstrated</td>
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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td><strong>Unit 4 - Radiological Techniques</strong></td>
<td></td>
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<tr>
<td><strong>Objective 8</strong></td>
<td>A. The atom and isotopes</td>
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<tr>
<td>Monitor radioactive materials in animal laboratory use.</td>
<td>- Radioactivity</td>
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<tr>
<td></td>
<td>- dangers</td>
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<tr>
<td></td>
<td>- self</td>
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<tr>
<td></td>
<td>- animals</td>
</tr>
<tr>
<td></td>
<td>- monitoring</td>
</tr>
<tr>
<td></td>
<td>- half-life</td>
</tr>
<tr>
<td><strong>Objective 9</strong></td>
<td>A. Animals treated with isotopes and other radioactive material</td>
</tr>
<tr>
<td>Safely handle animals which have been treated with</td>
<td>- Washing cages</td>
</tr>
<tr>
<td>radioactive materials.</td>
<td>- Care of animals</td>
</tr>
<tr>
<td></td>
<td>- Time period</td>
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<tr>
<td><strong>Objective 10</strong></td>
<td>A. Animal excretory wastes</td>
</tr>
<tr>
<td>Dispose of waste materials and clean cages of</td>
<td>- Deceased animals</td>
</tr>
<tr>
<td>animals treated with radioactive materials.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Lecture/discussion</td>
<td>A. Prepare notes on radioactive materials.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Participate in class discussion.</td>
</tr>
<tr>
<td>A. Lecture/discussion</td>
<td>A. Prepare notes</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Participate in class discussion.</td>
</tr>
<tr>
<td>A. Guest speaker - Radiological technician or veterinarian</td>
<td>A. Compile notes and participate in discussion.</td>
</tr>
<tr>
<td></td>
<td>B. Prepare a list of methods to dispose of animal waste materials.</td>
</tr>
</tbody>
</table>

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MODULE OF INSTRUCTION

Title - Radiological Techniques

RESOURCE MATERIALS

Books:

U.S. Army Manual of X-Ray Procedures
U.S. Government Printing Office
Washington, D. C.

The I.A.T. Manual of Laboratory Animal Practice & Techniques
D. J. Short & Dorothy P. Woodnott
Charles C. Thomas
Springfield, Illinois

Films:

1. Fundamentals of Radioactivity (Part 1)
2. Properties of Radiation
3. Practical Procedures of Measurement
4. The Physical Principles of Radiological Safety

The above four films may be obtained from

Commanding General
First U.S. Army Area
New York, New York
MODULE OF INSTRUCTION

Title - Hematology and Urine Analysis

DESCRIPTION:

The student will learn to do a complete urine analysis, consisting of tests for albumin, sugar, acetone, ketones, bile and other chemicals. In addition, microscopic examinations should include the identification of red and white blood cells, the different types of casts and tissue cells as well as the identification of the common crystals found in urine specimens. The student will also learn to count both the red and white blood cells in blood samples to determine the hemoglobin concentration in the sample. The student will learn to make and stain blood smears and identify the different types of blood cells found in the smears. The student will also learn to do sedimentation rates and hematocrits, as well as, bleeding and coagulation times.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
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</thead>
<tbody>
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<td>Class</td>
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<tr>
<td>1. Urinalysis</td>
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<tr>
<td>2. Blood Cell Counting</td>
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<tr>
<td>3. Hemoglobins</td>
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<tr>
<td>4. Hematocrit and Sedimentation Rates</td>
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<tr>
<td>5. Reticulocyte and Platelet Counts</td>
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<tr>
<td>6. Bleeding and Coagulation Procedure</td>
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</tbody>
</table>

Revised August 1975
OBJECTIVES to be obtained:

The student will be able to:

1. Determine the presence of albumin in urine.
2. Determine the presence of sugar, acetone, ketones, bile, and other chemicals in urine.
3. Use a microscope to identify red and white blood cells in urine samples.
4. Identify casts and tissue cells in urine samples.
5. Recognize and identify the common crystals found in urine samples.
6. Count red and white blood cells in blood samples.
7. Make and stain blood smears, and determine the different types of white blood cells seen on a blood smear.
8. Determine the hemoglobin of a blood sample.
9. Determine the sedimentation rate and volume of packed cells of a given blood sample.
10. Recognize both reticulocytes and platelets on a blood smear.
11. Determine the bleeding and coagulation times.
12. Recognize abnormal or infected blood cells seen on blood smears.
**OBJECTIVES BY UNIT**

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<thead>
<tr>
<th>Unit 1 - Urinalysis</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td><strong>Objective 1</strong></td>
<td>Determine the presence of albumin in urine.</td>
</tr>
<tr>
<td><strong>Objective 2</strong></td>
<td>Determine the presence of sugar, acetone, or ketones, bile, and other chemicals in urine.</td>
</tr>
<tr>
<td><strong>Objective 3</strong></td>
<td>Use a microscope to identify red and white blood cells in urine samples.</td>
</tr>
<tr>
<td><strong>Objective 4</strong></td>
<td>Identify casts, and tissue cells in urine samples.</td>
</tr>
</tbody>
</table>

**CONTENT**

- **A. Chemical analysis**
  - Protein
    - Blood
    - Albumin

- **B. Indications of analysis**
  - Glucose and other sugars
  - Acetone and other ketones
  - Bile

- **A. Slides**
- **B. Cover slips**
- **C. Microscope**
  - Powers
  - Focus
    - Course
    - Fine
- **D. Properties of red blood cell**
- **E. Properties of white blood cell**

**351**
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Compile notes</td>
<td>A. Teacher's evaluation of student's ability to determine the presence of albumin in urine.</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>B. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice techniques demonstrated</td>
<td></td>
</tr>
<tr>
<td>A. Lab demonstration</td>
<td>A. Observe demonstration</td>
<td>A. Teacher's evaluation of student's ability during lab exercise.</td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td>B. Practice identifying sugar, acetone and bile in urine during a lab exercise.</td>
<td></td>
</tr>
<tr>
<td>A. Demonstration</td>
<td>A. Observe demonstration and practice using the microscope.</td>
<td>A. Teacher's evaluation of student's ability to identify both red and white blood cells.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Prepare notes on properties of blood</td>
<td></td>
</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice using the identification of blood cells using a microscope.</td>
<td></td>
</tr>
<tr>
<td>A. Lecture - discussion</td>
<td>A. Participate in class activity</td>
<td>A. Teacher evaluation of student's ability to identify casts, and tissue cells.</td>
</tr>
<tr>
<td>B. Teacher demonstration</td>
<td>B. Observe demonstration</td>
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</tr>
<tr>
<td>C. Supervised practice</td>
<td>C. Practice identifying</td>
<td></td>
</tr>
<tr>
<td>D. Lab exercise</td>
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</tr>
</tbody>
</table>

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5
# Hematology and Urine Analysis

## Objectives by Unit

### Unit 2 - Blood Cell Counting

**Objective 6**
Count red and white blood cells in blood samples.

### Unit 3 - Hemoglobins

**Objective 7**
Make blood smear slides and determine different types of white blood cells on the smear.

**Objective 8**
Determine the hemoglobin content of a blood sample.

### Unit 4 - Hematocrit and Sedimentation Rates

**Objective 9**
Determine the sedimentation rate and volume of packed cells of a given blood sample.

## Content

### A. Collection of blood
- Diluting blood
- Filling counting chambers
- Automatic electronic counters
- Red blood count
- White blood count

### A. Leukocyte smears
- Making blood smears
- Types of white blood cells
- Differential white blood cells count
- Platelets

### A. Salhi and Haden Houser methods

### B. Cyanmethemoglobin methods

### A. Sedimentation rate of samples
- Micro technique
- Macro technique

### B. Volume of packed blood cells
<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Laboratory exercise</td>
<td>A. Participate in lab exercise</td>
<td>A. Teacher's evaluation of student's ability to recognize and count blood cells.</td>
</tr>
<tr>
<td></td>
<td>A. Prepare smears</td>
<td>A. Teacher's evaluation of student's lab procedure and ability to make smears.</td>
</tr>
<tr>
<td></td>
<td>B. Observe smears for abnormalities.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Infected cells</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Abnormal cells</td>
<td></td>
</tr>
<tr>
<td>A. Laboratory exercise</td>
<td>A. Determine the amount of hemoglobin in a sample</td>
<td>A. Teacher's evaluation of student's lab procedure.</td>
</tr>
<tr>
<td></td>
<td>using different methods.</td>
<td></td>
</tr>
<tr>
<td>A. Demonstration</td>
<td>A. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>B. Laboratory exercise</td>
<td>B. Complete lab and use both techniques.</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 5 - Reticulocyte and Platelet Counts</strong></td>
<td>A. Blood smear</td>
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<td>Objective 10 - Recognize both reticulocyte and platelets on a blood smear.</td>
<td>- Reticulocyte counts</td>
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<tr>
<td></td>
<td>- Platelet counts</td>
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<tr>
<td><strong>Unit 6 - Bleeding and Coagulation Procedure</strong></td>
<td>A. Bleeding time</td>
</tr>
<tr>
<td>Objective 11 - Determine the bleeding and coagulation times.</td>
<td>B. Coagulation time</td>
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<tr>
<td>Objective 12</td>
<td>A. Abnormalities</td>
</tr>
<tr>
<td>Recognize abnormal or infected blood cells seen on blood smears.</td>
<td>B. Identification of infection</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Demonstration</td>
<td>A. Complete lab exercise using demonstrated techniques.</td>
<td>A. Teacher's evaluation of student's lab procedure.</td>
</tr>
<tr>
<td>B. Laboratory exercise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Compile notes</td>
<td>A. Teacher's evaluation of student's lab procedure.</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>B. Observe demonstration</td>
<td></td>
</tr>
<tr>
<td>C. Laboratory exercise</td>
<td>C. Complete lab exercise</td>
<td></td>
</tr>
<tr>
<td>A. Laboratory exercise</td>
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<td></td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>A. Participate in laboratory exercise.</td>
<td>A. Teacher's evaluation of lab procedure.</td>
</tr>
<tr>
<td></td>
<td>B. Participate in class discussion.</td>
<td></td>
</tr>
</tbody>
</table>

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9
MODULE OF INSTRUCTION

Title - Hematology and Urine Analysis

RESOURCE MATERIALS

Books:

Laboratory Procedures in Clinical Hematology
Department of the Army Technical Manual
U.S. Government Printing Office
Washington, D. C.

Laboratory Procedures in Urinalysis
Department of the Army Technical Manual
U. S. Government Printing Office
Washington, D. C.

Approved Laboratory Technique
Kolmer J.A., Spaulding E.H., & H.W. Robinson
Appleton-Century-Crofts, Inc.
New York, New York

Audiovisuals:

The Blood
Encyclopedia Britannica Educational Corp.
Chicago, Illinois

1. White Blood Cells
2. Excretion
   McGraw-Hill Book Co.
   New York, New York
### Teaching Methods

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
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<tbody>
<tr>
<td>A.</td>
<td>Lecture</td>
</tr>
<tr>
<td>B.</td>
<td>Supervised study in collective birth and mature weights for each breed.</td>
</tr>
<tr>
<td>C.</td>
<td>Field trip to farms raising dairy beef.</td>
</tr>
<tr>
<td>D.</td>
<td>Supervised problem solving as to which animals and feeding programs for a project.</td>
</tr>
</tbody>
</table>

### Student Application Activities

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Note taking</td>
</tr>
<tr>
<td>B.</td>
<td>Selected members of the class will chart and prepare a bulletin board display of pictures of animals, their birth, and mature weights.</td>
</tr>
<tr>
<td>C.</td>
<td>Students must select the breed or breeds to use for a dairy beef project.</td>
</tr>
<tr>
<td>D.</td>
<td>Students indicate the feeding program and system.</td>
</tr>
</tbody>
</table>

### Evaluation Procedures

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Test written or oral on reason for specific selections, feeding and housing of dairy beef.</td>
</tr>
<tr>
<td>B.</td>
<td>Note book grade</td>
</tr>
<tr>
<td>C.</td>
<td>Student project grade.</td>
</tr>
</tbody>
</table>

- Agway Dairy Beef Program
- Economics of Tend-R-Leen
- Newspapers
- Local markets
- Local farmers
- Records
- Successful Farming 1/72 Vol. 70, No. 1
- Successful Farming 2/72 Vol. 70, No. 2
- Hoards Dairymen 2/10/72 Vol. 117, No. 3
- Hoards Dairymen 3/10/72 Vol. 117, No. 5
- Agway Cooperator Jan.-Feb. '68
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 2 | A. Feed Program  
- Colostrum - Free access at birth, possibly for (Essential) 2 days of life  
- Milk replacer - Tend-R-Leen Formula as advised by Mfg.  
- Calf grower - Tend-R-Leen Formula - free choice  
- Water - Free access  
- Bedding - Inedible product |
| Objective 3 | A. Special needs  
- 5 sq. ft./100 lbs. of weight  
B. Shelter  
- Draft free) Warm 40° - 50°  
- Dry  
C. Accessibility for cleaning  
- Not extremely important for calf pens  
- Easily disinfected every 6 weeks  
D. Temperature regulation  
- Electricity - Heat lamps for winter  
- Exhaust fans  
E. Handling facilities  
- Chute for restricting  
  - Dehorning  
  - Medicinal purposes |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Outline calf feeding program</td>
<td>A. Test on feeding programs, Essay questions</td>
</tr>
<tr>
<td>B. Review programs in area</td>
<td>B. Define the amounts to be fed of each item</td>
<td></td>
</tr>
<tr>
<td>C. Class discussion</td>
<td>C. Students report if they have animal units in their supervised work experience programs</td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Break class into two groups-</td>
<td>A. Oral or written test on requirements of housing facilities for growing dairy-beef calves.</td>
</tr>
<tr>
<td>B. Field trip to farm raising calves</td>
<td>- Research and record the needs of housing tender-teen calves</td>
<td>B. Grade on student discussion sessions.</td>
</tr>
<tr>
<td>C. Slides or film indicating types of housing facilities</td>
<td>- Research and record the needs of housing for dairy or other beef calves</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Discuss and compare results</td>
<td></td>
</tr>
</tbody>
</table>
## Objectives by Unit

### Unit 2 - Health Programs

**Objective #4**

Identify the causes, symptoms, and controls of calf diseases.

### Content

<table>
<thead>
<tr>
<th><strong>A. Causes of diseases</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Stress factors</td>
</tr>
<tr>
<td>- Low resistance</td>
</tr>
<tr>
<td>- Exposure to infectious disease organisms</td>
</tr>
<tr>
<td>- Wet drafty, contaminated quarters</td>
</tr>
<tr>
<td>- Pneumonia</td>
</tr>
<tr>
<td>- Leptospirosis</td>
</tr>
<tr>
<td>- Influenza</td>
</tr>
<tr>
<td>- Hemorrhagic septicemia</td>
</tr>
<tr>
<td>- Tuberculosis</td>
</tr>
<tr>
<td>- Navel infection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>B. Disease symptoms</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Off feed</td>
</tr>
<tr>
<td>- Nasal discharge</td>
</tr>
<tr>
<td>- Abnormal feces</td>
</tr>
<tr>
<td>- Coughing</td>
</tr>
<tr>
<td>- Listlessness</td>
</tr>
<tr>
<td>- Bloody discharge in urine and feces</td>
</tr>
<tr>
<td>- Abnormal temperatures</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>C. Disease controls</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- vaccinations</td>
</tr>
<tr>
<td>- Nutrition</td>
</tr>
<tr>
<td>- Antibiotics</td>
</tr>
<tr>
<td>- Management</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>D. Parasites - Symptoms and controls</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- Round worms</td>
</tr>
<tr>
<td>- Tape worms</td>
</tr>
<tr>
<td>- Others</td>
</tr>
</tbody>
</table>

---

**361**
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Guest speaker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Slides on common diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Assign two students to each disease. Research and oral report on the specific disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Research and record information to be used in a program for maintaining health in Dairy Beef</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Notes on students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Class discussion on each other students record information in report</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Written report on causes, symptoms, and control of diseases.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Notebook evaluation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Evaluation of students oral reports</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Objectives by Unit

<table>
<thead>
<tr>
<th>Objective</th>
<th>Content</th>
</tr>
</thead>
</table>
| 5         | A. Scours  
            . Symptoms  
            B. Pneumonia  
            . Symptoms |
| 6         | A. Hypodermic injection  
            B. Administering pills and capsules using balling gun  
            C. Temperature |
| 7         | A. Recommended dairy beef calf health program  
            . Immunizations  
            . Antibiotics  
            B. Disease prevention methods  
            . Feeding  
            . Management |

### Content

- **A. Scours**
  - Symptoms
- **B. Pneumonia**
  - Symptoms
- **A. Hypodermic injection**
- **B. Administering pills and capsules using balling gun**
- **C. Temperature**
- **A. Recommended dairy beef calf health program**
  - Immunizations
  - Antibiotics
- **B. Disease prevention methods**
  - Feeding
  - Management
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Field trip to a calf project</td>
<td>A. Practice detecting diseases and malfunctions in calves on the home farm, cooperative farm or animals used in supervised work experience programs.</td>
<td>A. Instructor's evaluation: Oral, Written</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Class discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Field trip to calf project</td>
<td>A. Discuss each procedure</td>
<td>A. Instructor's evaluation and performance grade</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Supervised study</td>
<td>B. Apply knowledge to animal units used in supervised work experience projects.</td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>A. Let each student use information previously acquired to outline a health program to be followed in raising Dairy Beef Calves</td>
<td>A. Instructor's evaluation of students health program</td>
</tr>
<tr>
<td>C. Veterinarian invited to class to discuss health problems.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Objectives by Unit

<table>
<thead>
<tr>
<th>Objective 8</th>
<th>Content</th>
</tr>
</thead>
</table>
| Demonstrate the ability to castrate dehorn, and trim hooves on young animals. | A. Castration  
- Elastration  
- Bridizoo  
- Scalpel or knife  
B. Hoof trimming  
- Snippers  
- Chisel  
C. Dehorning  
- Electric  
- Caustic pencil  
- Gauge |

<table>
<thead>
<tr>
<th>Objective 9</th>
<th>Content</th>
</tr>
</thead>
</table>
| Identify at least ten diseases and their symptoms, common to dairy beef animals from 6 weeks of age to finish. | A. Present value of animal including labor and feed.  
B. Specific diseases of concern  
- Shipping fever  
- Foot rot  
- Pneumonia  
- Warts  
- Pinkeye  
- Ringworm  
- Hardware  
- Tuberculosis  
- Tetanus  
- Eye cancer  
- Deficiencies  
- Bloat/feed-lot  
- Poisons |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Field trip to calf raising operation</td>
<td>A. Perform demonstrated skills of each operation on calves</td>
<td>A. Instructor's evaluation of students performance on animals</td>
</tr>
<tr>
<td>B. Demonstration of each operation and discussion</td>
<td>B. Discuss the problems which occur in actual operation</td>
<td>B. Oral or written test on content</td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>C. Keep notes on field trips, demonstrations and class discussion.</td>
<td></td>
</tr>
<tr>
<td>B. Assign each student to prepare causes symptoms and control - report on one disease.</td>
<td>A. Prepare a report on the disease assigned by each student. Report thoroughly using mimeo handouts, blackboard, film strips or slides.</td>
<td>A. Evaluation of reports and notebook work.</td>
</tr>
<tr>
<td>C. Discussion</td>
<td>B. Take notes on reports, recording causes, symptoms, and controls, of each disease.</td>
<td></td>
</tr>
</tbody>
</table>

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## OBJECTIVES BY UNIT

**Unit 3 - Growing the Animals**

**Objective 10**

Outline a feeding program for Dairy Beef from age 6 weeks to finish.

<table>
<thead>
<tr>
<th>Animals should weigh approximately 200 lbs at 6 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>200-400 lbs</strong> - Feed/animal</td>
</tr>
<tr>
<td>Tenderleen Grower Conc.</td>
</tr>
<tr>
<td>Whole Shell corn, or high moist.</td>
</tr>
<tr>
<td>Water</td>
</tr>
<tr>
<td>Mineral mix-ADF</td>
</tr>
<tr>
<td>Salt and ground limestone</td>
</tr>
<tr>
<td>1 1/2-2 lbs/da.</td>
</tr>
<tr>
<td>Free choice</td>
</tr>
<tr>
<td>Free choice</td>
</tr>
<tr>
<td><strong>400-600 lbs</strong>.</td>
</tr>
<tr>
<td>Tend-R-Leen Steer Finisher Concentrate</td>
</tr>
<tr>
<td>Whole shelled or high moist. con.</td>
</tr>
<tr>
<td>Water</td>
</tr>
<tr>
<td>Mineral mix-ADF</td>
</tr>
<tr>
<td>Salt and ground limestone</td>
</tr>
<tr>
<td>1 1/2-1 lb/da.</td>
</tr>
<tr>
<td>Free choice</td>
</tr>
<tr>
<td>Free choice</td>
</tr>
<tr>
<td><strong>600 lbs</strong>. - Finish</td>
</tr>
<tr>
<td>Tend-R-Leen Steer Finisher Conc.</td>
</tr>
<tr>
<td>Whole shelled or high moist. con.</td>
</tr>
<tr>
<td>Water, mineral mix ADF</td>
</tr>
<tr>
<td>Salt and ground limestone</td>
</tr>
<tr>
<td>1 1/2 lb/da.</td>
</tr>
<tr>
<td>Free choice</td>
</tr>
<tr>
<td>Free choice</td>
</tr>
<tr>
<td>Free choice</td>
</tr>
</tbody>
</table>
### TEACHING METHODS

<table>
<thead>
<tr>
<th>A. Supervised study</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Review records of Dairy Beef Programs in the community</td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

| A. Students select a program that would work in a given farm situation. Give reasons and justification for the selected program. |

### EVALUATION PROCEDURES

| A. Oral quiz on feeding program selected by students. |

---

**Educational Document**

**Title:** RAISING DAIRY BEEF

**Page:** 368

**Code:** 01.01010600-03
Title - RAISING DAIRY BEEF

OBJECTIVES BY UNIT

Objective 11

Select 10 requirements of housing, and lot facilities required for growing Dairy Beef steers 6 weeks to finish.

Unit 4 - Finish and Marketing

Objective 12

Name the proper feeding techniques to be used in finishing Dairy Beef.

CONTENT

A. Special requirements
   - 5-10 sq. ft./100 lbs. of animal (on paved lots)
   - 150-500 sq. ft./head (on unpaved lots)

B. Shelter -
   - 3-sided structure
   - Draft free
   - Not susceptible to wind or elements
   - Accessible for mechanical cleaning
   - Dry

C. Watering
   - Automatic

D. Handling facilities
   - Restricting chute
   - Scales or tape animals
   - Loading ramp

F. Fencing
   - Wood
   - Metal

A. Underfinishing
   - Animals which should have been culled
   - Insufficient feeding conditions
   - Lack of water

B. Overfinishing
   - Overfeeding
   - Early finish lower quality

C. Economy
   - Total cost of raising animals
   - Cost per day of raising animals
   - Profit margin over feed cost
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Research and record requirements of housing, lots, and facilities for Dairy Beef</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Field trip to established operation to observe the structures essential for handling Dairy Beef</td>
<td>B. Calculate special requirements.</td>
<td>B. 3-special requirement problems constructed by the instructor.</td>
</tr>
<tr>
<td></td>
<td>C. Construct a model of a recommended facility for 50 head of livestock (pole barn and fence)</td>
<td>C. Evaluate model plans.</td>
</tr>
<tr>
<td>A. Guest speakers</td>
<td>A. Record notes on class lecture and discussion and speakers.</td>
<td>A. Oral or written test on objective material.</td>
</tr>
<tr>
<td>- Feeder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Livestock marketer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Farmer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Select students to plot a growth curve for</td>
<td>B. Underfinished animals vs. Economy</td>
<td></td>
</tr>
<tr>
<td>- Underfinished animals vs. Economy</td>
<td>B. Overfinished animals vs. Economy</td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
<td></td>
</tr>
</tbody>
</table>
| Objective 13       | **A. Market Outlets**  
| Locate 5 facilities available for marketing Dairy Beef | . Friends and relatives  
|                    | . Locate slaughter and retail facilities  
|                    | . Chain stores  
|                    | . Livestock markets  
|                    | . Dealers  
|                    | **B. Prices**  
|                    | . Supply  
|                    | . Demand  

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Problem solving discussion of actual cases.</td>
<td>A. Students can contact available prospective buyers of the finished product and report findings to class.</td>
<td>A. Instructor's evaluation of students reports.</td>
</tr>
<tr>
<td>B. Let each student locate 2 available facilities used to market Dairy Beef. Report on the advantages and disadvantages of each facility.</td>
<td>B. Make note of projected values.</td>
<td></td>
</tr>
</tbody>
</table>
Title - RAISING DAIRY BEEF

RESOURCE MATERIALS

A. Books - Beef Cattle, Neumann & Snapp, 6th edition, J. Wiley & Sons
   Animal Science, Ensminger, Interstate
   Cattleman's Handbook, Interstate
   Animal Sanitation & Disease Control, Interstate

B. Bulletins -
   1. Economics of Tend-R-Leen, Doby Feeds, New Richmond, Wisc.
   2. Tend-R-Leen Beef Feeding Program, Beacon Feeds
   3. Agway Beef Feeding Program, Agway Coop.
   4. Bulletins from other feed companies

C. Periodicals -
   Hoards Dairyman
   Successful Farming
   Agway Cooperator
   Beacon News
   Farm Journal
   Cattleman's Journal
Title - PLANNING THE CROPPING PROGRAM

DESCRIPTION:

The plan for a cropping program depends on the type of farm enterprises, geographic location, alternative markets, and varieties of crops available. Students will develop skills in planning a suitable cropping program that will provide adequate feed for a particular enterprise.

Analysis of the characteristics of the land, micro-climate, feed requirements or markets of several farms will be conducted in order to determine crop programs best suited to such enterprises or markets.

DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1. Cropping Considerations</td>
</tr>
<tr>
<td>2. Determining the Soil Productivity</td>
</tr>
<tr>
<td>3. Selecting the Crops and Varieties</td>
</tr>
<tr>
<td>4. Crop Inputs</td>
</tr>
<tr>
<td>5. Determining the Crop Requirements for a Specific Enterprise or Market</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Revised January '75
MODULE OF INSTRUCTION

Title - PLANNING THE CROPPING PROGRAM

OBJECTIVES to be obtained:

The student will be able to:

1. Determine the climatic factors that influence a cropping program.
2. Determine the influence of soils on the cropping program.
3. Determine the cropping program as it may be influenced by governmental agencies.
4. Determine the cropping program on the basis of the physical farm situation.
5. Determine the needs for forage and grains by various classes of livestock.
6. Determine the benefit of rotation vs. mono cropping system.
7. Determine the yield of crops on a farm under various situations of management and soil condition.
8. Select crop species and varieties suitable for a cropping program of a given farm on the basis of climate, soil and physical situation.
9. Determine inputs that are required for the production of a crop and the possible anticipated returns.
10. Prepare a comprehensive plan for a farm cropping program.
### Objectives by Unit

<table>
<thead>
<tr>
<th>Unit 1 - Cropping Considerations</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #1</td>
<td></td>
</tr>
<tr>
<td>Determine the climate factors that influence a cropping program.</td>
<td>A. Climate Factors affecting crop production</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective #2</td>
<td></td>
</tr>
<tr>
<td>Determine the influence of soils on the cropping program.</td>
<td>A. Soil conditions to be considered</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective #3</td>
<td></td>
</tr>
<tr>
<td>Determine the cropping program as it may be influenced by governmental agencies.</td>
<td>A. Governmental programs available</td>
</tr>
</tbody>
</table>

#### A. Climate Factors affecting crop production
- Rainfall and moisture
  - monthly and seasonal
  - amount at a given time
  - number of days having 0.1 inch rain a month
- Temperatures
  - variations within month
  - patterns
- Growing season
  - frost dates
  - season
  - growth degrees
- Dry length factors
- Sunshine and cloud cover
- Wind speed and direction
- Micro climatic conditions
  - frost
  - rainfall
  - topographic influence

#### A. Soil conditions to be considered
- Texture
- Structure
- Tilth
- Slope
- Erosion
- Drainage class
- Ease of cultivation
- Fertility level

#### A. Governmental programs available
- Acreage controls
  - wheat
  - corn
  - soybean
- Conservation practices
  - pasture renovation
  - lime program
- Applications for varied programs
  - preparation of farms

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture - Discussion of weather through the year and growing season using weather data from &quot;What's Cropping Up&quot; - Weather, crop reporting service data, and local weather station data.</td>
<td>A. Preparation of charts and graphs of climatic factors. Operation of weather instruments at school and compare observations with those of local weather stations.</td>
<td>A. Written exam on target dates for planting crops and estimate harvest patterns based on weather and climatic conditions.</td>
</tr>
<tr>
<td>B. Student preparation of rainfall graphs for area for growing season. Calculation of Growing Degree Days available for field crops. Determination of critical photo period dates, planting periods for specific crops.</td>
<td>B. Calculation of Daily Heat Degree Days and amount of growing season information.</td>
<td>B. Calculation of Daily Heat Degree Days and amount of growing season information.</td>
</tr>
<tr>
<td>C. Tape recordings of daily weather forecasts for local area, particular emphasis of the agricultural forecast including long range forecast.</td>
<td>C. Preparation of list of crops that can be successfully grown based on climatic information for your area.</td>
<td>C. Preparation of list of crops that can be successfully grown based on climatic information for your area.</td>
</tr>
<tr>
<td>D. Lecture - Discussion and group study of climatic requirements for plant growth.</td>
<td></td>
<td>A. Written report of visit or field trip for evaluation of government programs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A. Oral evaluation of government programs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. Oral evaluation of government programs.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C. Student written reports on the influence of government programs.</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>
## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective #4</th>
<th>Objective #5</th>
<th>Objective #6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine the cropping program on the basis of the physical farm situation.</td>
<td>Determine the needs for forage and grains by various classes of livestock.</td>
<td>Determine the benefit of rotation vs. mono cropping system.</td>
</tr>
</tbody>
</table>

### CONTENT

<table>
<thead>
<tr>
<th>A. Suitability of cropping program based on physical facilities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fields</td>
</tr>
<tr>
<td>location of field in relation to buildings</td>
</tr>
<tr>
<td>shape</td>
</tr>
<tr>
<td>size of fields</td>
</tr>
<tr>
<td>special problems</td>
</tr>
<tr>
<td>wet</td>
</tr>
<tr>
<td>stony</td>
</tr>
<tr>
<td>B. Labor requirements and availability</td>
</tr>
<tr>
<td>Full time</td>
</tr>
<tr>
<td>Part time</td>
</tr>
<tr>
<td>C. Equipment requirements</td>
</tr>
<tr>
<td>Specialized</td>
</tr>
<tr>
<td>General purpose</td>
</tr>
<tr>
<td>D. Storage facilities</td>
</tr>
<tr>
<td>Capacity</td>
</tr>
<tr>
<td>Age and condition</td>
</tr>
<tr>
<td>Convenience</td>
</tr>
</tbody>
</table>

### A. Using the home farm or sample farm:

- Determine number of animal units
- Determine feeding requirements for a unit for feeding season for forage.
- Determine the total amounts of forage needed for feeding season.
  (This can be expressed in terms of tons or H.E.)
Grain requirements may be calculated in a similar manner.

### B. Determination of needs for average animal based on production either in TDN lbs. or converted pounds of grain.

### C. Determination of total needs for the various classes of livestock.

### A. Rotation vs. mono cropping

- Soil structure
- Drainage
- Weed control
- Disease control
- Insect pests
- Plant residue
- Erosion
- Fertility
### TEACHING METHODS

| A. Lecture and group discussion of the physical facilities necessary for various crops. |
| Study farm maps for field conditions. |
| Determination of labor distribution requirements |

| B. Discussion of machines necessary for various crops with emphasis on machine that may be more versatile. |
| C. Comparison of work units required for various crops (compare 10 years ago with present time) |
| D. Field trip to farm to examine storage facilities for capacity - convenience - condition. |

### STUDENT APPLICATION ACTIVITIES

| A. Figure work units for crops grown on farms now and 10 years ago. |
| B. Prepare charts showing labor distribution for various crops. |
| C. Prepare lists of machines necessary for various crops |
| D. Calculate storage capacity of facilities in bins, mows, cribs, silos, and sheds for various crops. |

### EVALUATION PROCEDURES

| A. Written report by the student based on a specific situation. |
| B. A written evaluation of the influence of physical facilities. |
| C. Written quiz on calculation of storage facilities. |

### A. Lecture, discussion, and calculations of:

- Animal units
- Feeding rates
- Length of feeding season
- Calculations of animal units
- Feeding rates and length of feeding season

### B. Using home situations students determine number of animal units, length of feeding season, and tons of forage needed. |

### A. Written notes from readings and from board materials |

### B. Oral participation, as to value of a system in a given situation.
### PLANNING THE CROPPING PROGRAM

#### OBJECTIVES BY UNIT

**Unit 2 - Determining the soil productivity.**

**Objective #7.**

Determine the yield of crops on a farm under various situations of management and soil condition.

- **Determination yields/acre**
  - Silage corn
    - standing in field
    - crop in silo
    - tower
    - bunker
  - Grain corn
    - conversion from silage
    - ear corn
    - grain
    - Small grain
  - Hay

**Unit 3 - Selecting the crops and varieties to use.**

**Objective #8.**

Select crop species and varieties suitable for a cropping program of a given farm on the basis of climate, soil and physical situation.

- **Forage Crops Selection Factors**
  - General
  - Early cutting
  - Seasonal sequence of cutting 1st cut
  - Repeat cuttings
  - Soil condition
  - Yield 1 acre - cut and season
  - Combination compatibility
  - Disease resistance
  - Amount of seed available

- **Legume variety selection**
  - Small grains
    - oats
  - Birdsfoot trefoil
  - Clovers
  - Alfalfa
  - Barley
  - Buckwheat

- **Grasses**
  - Timothy
  - Brome grass
  - Orchard grass

- **Special Situation Materials**
  - Soybeans
  - Sugarbeets
  - Crown vetch

- **Corn**
  - Growth degrees
  - Elevation
  - Soil conditions
  - Standability
  - Disease resistance

- **Summer annuals**
  - Emergency hay

- **Special purpose crops**
  - Forage crops

- **Other local crops**

---

**AGRICULTURAL CONTENT**

Determination yields/acre

- Silage corn
  - standing in field
  - crop in silo
  - tower
  - bunker
- Grain corn
  - conversion from silage
  - ear corn
  - grain
  - Small grain
- Hay

**Determination yields/acre**

- **Unit 2 - Determining the soil productivity.**
  - Objective #7.
  - Determine the yield of crops on a farm under various situations of management and soil condition.

- **Unit 3 - Selecting the crops and varieties to use.**
  - Objective #8.
  - Select crop species and varieties suitable for a cropping program of a given farm on the basis of climate, soil and physical situation.

### CONTENT

<table>
<thead>
<tr>
<th>A. Determination yields/acre</th>
<th>B. Determine yield on basis of soil conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silage corn</td>
<td>Soil name or type</td>
</tr>
<tr>
<td>standing in field</td>
<td>Drainage class</td>
</tr>
<tr>
<td>crop in silo</td>
<td>Slope</td>
</tr>
<tr>
<td>tower</td>
<td>Erosion</td>
</tr>
<tr>
<td>bunker</td>
<td>Fertility level</td>
</tr>
</tbody>
</table>
### Teaching Methods

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>A.</td>
<td>Lecture - Discussion of methods used to determine yields.</td>
</tr>
<tr>
<td>B.</td>
<td>Field trip to sites as crops are being harvested to determine yields/acre under differing conditions.</td>
</tr>
<tr>
<td>C.</td>
<td>Examination of crop record books for yields per acre for area farms by yields.</td>
</tr>
<tr>
<td>D.</td>
<td>Comparison of yields in terms of index number based on soil conditions - comparison with county averages or other.</td>
</tr>
<tr>
<td>E.</td>
<td>Field trips to sites to determine results of soil test information. Cornell soil test results or other agency testing program, Extension demonstration photos for techniques and yield comparisons.</td>
</tr>
</tbody>
</table>

### Student Application Activities

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Determine yields of various crops on the home or cooperative farm.</td>
</tr>
<tr>
<td>B.</td>
<td>Review soil productivity index charts.</td>
</tr>
<tr>
<td>C.</td>
<td>Collect soil samples using soil augers.</td>
</tr>
<tr>
<td>D.</td>
<td>Test samples for pH levels. Sample soil and determine drainage - slope - erosion level.</td>
</tr>
</tbody>
</table>

### Evaluation Procedures

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A.</td>
<td>Written quizzes covering yield determination and index calculations.</td>
</tr>
<tr>
<td>B.</td>
<td>Sampling soil - and testing techniques.</td>
</tr>
<tr>
<td>C.</td>
<td>Lab exercise on soil testing using unknown samples, grade students on lab techniques and accuracy of results.</td>
</tr>
</tbody>
</table>

### Student Application Activities

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A.</td>
<td>Use Cornell Recommends for Forage Crops as primary reference for individual study.</td>
</tr>
<tr>
<td>B.</td>
<td>Identification of seed samples (plant mounts) - slides and pictures.</td>
</tr>
<tr>
<td>C.</td>
<td>Field trip to local seed dealer to discuss prices, availability of seed and recommendations for given years.</td>
</tr>
<tr>
<td>D.</td>
<td>Examination of sales literature of seed from local seed dealers.</td>
</tr>
</tbody>
</table>

### Evaluation Procedures

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>A.</td>
<td>Written report of selection of crop species and varieties that meet the criteria established for a given situation.</td>
</tr>
</tbody>
</table>
## Planning the Cropping Program

### Objectives by Unit

<table>
<thead>
<tr>
<th>Unit</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Crop Inputs</td>
</tr>
<tr>
<td>5</td>
<td>Determining the Crop Requirements for a Specific Enterprise or Market</td>
</tr>
</tbody>
</table>

### Objective 9
Determine inputs that are required for the production of a crop and the possible anticipated returns.

### Objective 10
Prepare a comprehensive plan for a farm cropping program.

### Content

<table>
<thead>
<tr>
<th>Factors to Consider</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Land resources</td>
</tr>
<tr>
<td>B. Labor requirement</td>
</tr>
<tr>
<td>C. Equipment and machinery</td>
</tr>
<tr>
<td>D. Seed</td>
</tr>
<tr>
<td>E. Fertilizer</td>
</tr>
<tr>
<td>F. Chemicals</td>
</tr>
<tr>
<td>G. Total capital requirements</td>
</tr>
<tr>
<td>H. Value of crop return for investments</td>
</tr>
</tbody>
</table>

A. Students are to plan a cropping program for a given farm given a set of conditions or for the home farm that will reflect the mastery of previous work.

- Climate
- Soils
- Physical conditions of the farm
- Governmental programs
- Needs for livestock (if applicable)
- Select varieties and plan seeding rates—reflecting items.
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Using cost account figures for the given crops. Farm management handbook &amp; Extension Service information and data from school demonstration plots - Determine the inputs and costs involved in producing crops under varying conditions.</td>
<td>A. Calculating the costs of inputs and returns of various crops.</td>
<td>A. Observation of student ability to select crops on the basis of inputs to returns in given situations. Oral reasons for selections and inputs used.</td>
</tr>
<tr>
<td>B. Field trip to sites to observe the crop at varying stages from planting, growing through harvesting.</td>
<td>B. Determine profitableness of a given crop in a given situation.</td>
<td>B. Evaluation of field trip reports or demonstration plot projects.</td>
</tr>
<tr>
<td>C. For crop(s) grown on school demonstration area have students calculate the input and returns to determine profitableness of proposed enterprise(s).</td>
<td>C. Complete a crop demonstration cost account project.</td>
<td></td>
</tr>
<tr>
<td>A. Demonstrate using the chalkboard for application of skills in determining the cropping program.</td>
<td>A. Students work out trial cropping programs using appropriate work sheets.</td>
<td></td>
</tr>
<tr>
<td>B. Use a sample farm situation.</td>
<td>B. Preparation of final programs showing justifications for program.</td>
<td></td>
</tr>
<tr>
<td>C. Use Farm SCS Maps</td>
<td>C. Plan a cropping program for the land laboratory or crop demonstration project.</td>
<td></td>
</tr>
<tr>
<td>D. Overhead transparencies of charts and pages from sample farm.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Observation of student ability to select crops on the basis of inputs to returns in given situations. Oral reasons for selections and inputs used.</td>
<td>B. Evaluation of field trip reports or demonstration plot projects.</td>
<td></td>
</tr>
</tbody>
</table>
Title: PLANNING THE CROPPING PROGRAM

RESOURCE MATERIALS

A. Books -
- Crop Production, 3rd edition
  DeLorit and Henry L. Ahlgren, Prentice-Hall Inc.
- Doane's Farm Management Guide
- Farm Crop Production Technology
  OE - 81016
- Yearbook of Agriculture - 1957 Soil
- Modern Farm Management Handbook - Hall & Morrison - Interstate
- Modern Corn Production - Aldrich & Leng - F&W Publishing Corp.
  (Farm Quarterly), Cincinnati, Ohio
- Modern Soybean Production - Aldrich - F&W Publishing Corp. - Cincinnati
- Farm Soils - E.L. Worthen & S.R. Aldrich - Wiley
- Farm Management Handbook - Department of Agricultural Economics, College of Agriculture, I.M.S.
- Producing Farm Crops - Wilson & Richer - Interstate

B. Bulletins -
- Spring Grain - Cornell Ext. Bulletin 1181
- Soil Areas of ——— County - County Agricultural Agents.
- What is Conservation Farm Plan - Leaflet 249 - U.S.D.A.

C. Periodicals -
- Cornell Recommends for Field Crops current publication
- Successful Farming Magazines
- Farm Journal Magazines
- Hoards Dairymen Magazines
- What's Cropping Up - Agronomy Department - College of Agriculture

D. Audiovisuals -
- ASCS or SCS - Aerial View of areas - showing locations of farm, fields, etc.
  Farm Maps and SCS Conservation Plans.
- Plant Hardiness Zone Maps.
MODULE OF INSTRUCTION

Title - GROWING THE CROP

DESCRIPTION:

The student will be involved in the preparation of the soil, timing of planting, planting, and culture of the crop. Conventional tillage and minimum tillage methods will be compared. The care of seeds, planting depth, width of rows, plant population, fertilization, and lime requirements will be discussed.

Controlling insects, diseases, and weeds will be discussed. The use of the proper insecticides and herbicides will be included in this instruction.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Choosing the crops</td>
<td>1</td>
</tr>
<tr>
<td>2. Limiting factors of crop production</td>
<td>2</td>
</tr>
<tr>
<td>3. Preparing to plant the crop</td>
<td>1</td>
</tr>
<tr>
<td>4. Planting the crop</td>
<td>1</td>
</tr>
<tr>
<td>5. Controlling weeds, insects, and diseases</td>
<td>4</td>
</tr>
<tr>
<td>6. Crop records</td>
<td>1 10</td>
</tr>
</tbody>
</table>

Revised February 1975
OBJECTIVES to be obtained:

The student will be able to:

1. Develop reasons or justification for growing a crop or crops.
2. List six limiting factors in the production of given crops without the use of references.
3. List all cultural practices to be used in growing selected crops at the highest profit level, given production data.
4. Select amounts and types of fertilizer and seeds for selected crops, given adequate information.
5. Operate, to the instructor's satisfaction, tillage equipment used to grow selected crops.
6. Clean, calibrate, and operate, to the instructor's satisfaction equipment used to plant selected crops.
7. Identify ten weeds that affect production of selected crops and correctly list two effective methods of controlling each weed.
8. Identify five insects that may affect crop production, and indicate one effective method of controlling each.
9. Identify five diseases that may affect crop production and indicate one effective method controlling each.
10. Keep, to the instructor's satisfaction, cost, materials, and labor records for the crop(s) grown.
11. Use the problem solving method to solve a given problem related to the growing of a specific crop, using necessary references.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Choosing the crops</strong>&lt;br&gt;Objective #1&lt;br&gt;Develop reasons or justification for growing a crop or crops.</td>
<td>A. To grow for sale as <strong>cash</strong> crops&lt;br&gt;B. To use as an animal feed in the farm business (convert to milk or meat).&lt;br&gt;C. To grow for sale at roadside stands&lt;br&gt;D. To have own project for work experience and money.&lt;br&gt;  - Demonstration project&lt;br&gt;  - FFA money raising project&lt;br&gt;  - Family farm&lt;br&gt;  - Individual student project</td>
</tr>
<tr>
<td><strong>Unit 2 - Limiting factors of crop production</strong>&lt;br&gt;Objective #2&lt;br&gt;List six limiting factors in the production of given crops without the use of references.</td>
<td>A. Seed bed preparation&lt;br&gt;B. Plant population - and spacing&lt;br&gt;C. Moisture&lt;br&gt;D. Fertility&lt;br&gt;E. Weeds&lt;br&gt;F. Insects&lt;br&gt;G. Diseases&lt;br&gt;H. Time of planting&lt;br&gt;I. Proper timing of application of chemicals for -&lt;br&gt;  - E - F - G.</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>A. Compare TDN output of forage and grain crops common to school area.</td>
<td>A. Make computations (using Cornell farm business Analysis sheets - (top 10%) to gain TDN output of forage and grain crops.</td>
</tr>
<tr>
<td>B. Show cost accounts of profit ability of cash crops - (Grains-Roughages)</td>
<td>B. Make notes on return/hr of labor if it is a cash crop.</td>
</tr>
<tr>
<td>C. Show summarized crop records from files of other years' record.</td>
<td>C. Determine how crop will fit into present farm business.</td>
</tr>
<tr>
<td>D. Give examples of several cropping programs in school district and how they fit into the farm business.</td>
<td>D. Determine if choice of crop will prove financially rewarding. Anticipated - returns. Less expenses. Probable profit margin</td>
</tr>
</tbody>
</table>

A. Lecture - discussion to present information (slides will be useful). B. Trip to field where the student will plant crop in to evaluate limiting factors. Field trip to FFA demonstration plot or extension service research plots.

A. Take notes on information presented. B. Observe and record limiting factors in field where crop will be planted. C. Have students apply information learned to the home farm or demonstration plot situations.

A. Written or oral test. List 6 limiting factors. B. Evaluate student's ability to detect limiting factors in a selected field. C. Give credit for hands on type work performed by any student involved in supervised work experience programs.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 3 - Preparing to plant the crop</strong></td>
<td></td>
</tr>
<tr>
<td>Objective #3</td>
<td>List all cultural practices to be used in growing selected crops at the highest profit level, given production data</td>
</tr>
<tr>
<td>Objective #4</td>
<td>Select amounts and types of fertilizer and seeds for selected crops, given adequate information</td>
</tr>
</tbody>
</table>

**A. The following will be considered for each of the selected crops:**
- Soil preparation prior to planting
- Planting the crop -
  - time
  - depth
  - seeding rate
  - fertilizer rate
  - plant spacing

**B. Controlling weeds, insects, and diseases**
- Mechanical means
- Chemical means

**C. Special cultural practices**
- Irrigation
- Top dressing

**A. Fertilizer and limitations**
- Taking and interpreting soil tests
- Types of fertilizer to apply - ratios
- Amount of fertilizer to apply - analysis
- Time of application
- Methods of application

**B. Seeds**
- Varieties - and their advantages
- Hybrid seed - explanation of
- Adaptability to climate - growing season
- Sources of seed
- Experiences of local farmers
- Prices
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Prepare a laboratory work sheet(s) on exercise that students can fill out</td>
<td>A. Students complete lab exercise or work sheets on recommended cultural practices. Class discussion to follow.</td>
<td>A. Written test on cultural practices for particular crop will be given.</td>
</tr>
<tr>
<td>B. Teacher discuss above work sheet or lab exercise in class.</td>
<td>B. Students complete work sheets and make necessary changes.</td>
<td></td>
</tr>
<tr>
<td>C. Problem solving to determine cultural practices to use on school demonstration project or on students home farm.</td>
<td>C. Use the problem solving method to determine cultural practices on school demonstration project.</td>
<td></td>
</tr>
<tr>
<td>A. Use prepared lab exercise written by teacher to help students research new information.</td>
<td>A. Students complete study exercise on fertilizer and seeds. Class discussion to follow plus problem solving</td>
<td></td>
</tr>
<tr>
<td>B. Lecture - discussions to present information.</td>
<td>B. Take notes on new information</td>
<td></td>
</tr>
<tr>
<td>C. Demonstration</td>
<td>C. Take soil samples - send in for testing for pH, ( \text{P}_2\text{O}_5 ), ( \text{K}_2\text{O} ) and nitrogen</td>
<td></td>
</tr>
<tr>
<td>D. Field trip to local fertilizer and seed sales.</td>
<td>D. Determine amounts of lime to apply for selected crops.</td>
<td></td>
</tr>
<tr>
<td>E. Field trip to demonstration area to obtain soil samples and map area.</td>
<td>D. Take notes on prices. Recommendations. Methods of application.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Written test on fertilizer analysis prices - best buy and on seed varieties recommended.</td>
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<tr>
<td></td>
<td>B. Evaluate students ability to take soil samples and understand test results.</td>
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<td></td>
<td>C. Evaluate students ability to select correct fertilizer for a given situation.</td>
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<tr>
<td></td>
<td>D. Written or oral test on lime-liming and reading of pH scale.</td>
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</tr>
<tr>
<td></td>
<td>E. Make out a written lab report on selecting seeds and fertilizer.</td>
<td></td>
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<tr>
<td></td>
<td>F. Lab test on unknown soil samples for lime, N.P.K.</td>
<td></td>
</tr>
</tbody>
</table>
## Objectives by Unit

### Objective #5
Operate, to the instructor's satisfaction, tillage equipment used to grow selected crops.

### Objective #6
Clean, calibrate, and operate, to the instructor's satisfaction, equipment used to plant selected crops.

## Content

**A. Purposes of tillage equipment**
- Loosen soil
- Provide air and water spaces
- Develop proper seed bed for seed to germinate
- Provide type of medium adaptable

**B. Types of tillage equipment**

**C. Operating tillage equipment**
- Safety
  - Efficiency
  - Field adjustments
  - Calibration methods

---

**Unit 4 - Planting the Crop**

**Objective #6**
Clean, calibrate, and operate, to the instructor's satisfaction, equipment used to plant selected crops.

**A. Types of planting equipment**
- Grain drills
- Corn planters
- Spreaders
- Broadcasters

**B. Preparing equipment for planting**
- Cleaning equipment
- Lubricating equipment
- Calibrating equipment

**C. Operating planting equipment**
- Safety
  - Efficiency
  - Field adjustments
# GROWING THE CROP

## TEACHING METHODS

<p>| | | |</p>
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</thead>
</table>
| A. Lecture, demonstration to present information. | A. Students will determine what tillage equipment to use for selected crops and report their findings to the class. | A. Observe students operating machinery. Evaluate:  
- Safety  
- Efficiency  
- Ability to make adjustments |
| B. Supervised study to determine tillage equipment used for selected crops. | B. Students will operate tillage equipment used for growing a selected crop. | B. Written report on safety as it relates to operating tillage equipment. |
| C. Student reporting | | |
| D. Demonstration of how to operate equipment | | |
| E. Student practice, supervised work experience at land lab. | | |

## STUDENT APPLICATION ACTIVITIES

<p>| | | |</p>
<table>
<thead>
<tr>
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</thead>
</table>
| A. Field trip to machinery dealer(s) to observe types of planting equipment. | A. Develop list of different planting equipment used in the area and indicate crops planted with each. | A. Written or oral test to determine if student knows:  
- Types of planting equipment and its uses.  
- Calculations to calibrate equipment. |
| B. Demonstration of cleaning, lubricating and operating planting equipment. | B. Clean, lubricate and calibrate at least a corn planter and a grain drill. | B. Evaluate student's ability to clean, lubricate, calibrate and operate at least the corn planter and grain drill, in terms of:  
- Safety  
- Efficiency  
- Accuracy |
| C. Student practice at school, home farm or cooperative farm. | C. Operate planting equipment. | |
## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 5 - Controlling weeds, insects, and diseases</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #7 Identify ten weeds that affect production of selected crops and correctly list two effective methods of controlling each weed.</td>
<td><strong>A. Weeds affecting crop production</strong>&lt;br&gt;. Identification&lt;br&gt;. Methods of control&lt;br&gt;. Herbicides available&lt;br&gt;. Forms - granular - liquid&lt;br&gt;. Application - methods&lt;br&gt;. Timing&lt;br&gt;&lt;br&gt;<strong>Objective #8</strong> Identify five insects that may affect crop production, and indicate one effective method of controlling each.</td>
</tr>
</tbody>
</table>
### TEACHING METHODS

| A. Group consensus to determine ten or more weeds affecting area. Use slides or mounts. |
| B. Supervised study to determine effective control measures. Use work sheets made by teacher. |
| C. Student discussion of work sheets. |
| D. Student practice of weed identification |
| E. Demonstration on sprayer and nozzles, pressures - cleaning and calibrating. |
| F. Review recent Cornell Recommends on latest information and restrictions - lab exercise. |

### STUDENT APPLICATION ACTIVITIES

| A. Determine weeds affecting area by: |
| - Memory of past problems |
| - Field trip to observe current situation |
| - Discussion with area farmers - custom applicators. |
| B. Individually determine methods of controlling selected weeds, and report on work sheet and hold class discussion. |
| C. Study weed specimens for identification. |
| D. If possible apply weed control measures to school crop demonstration or on local crop. |
| E. Complete lab exercise and discuss dilution, rates of application, and timing. |

| A. Determine insects affecting area by: |
| - Memory of past problems |
| - Field trip to observe current situation |
| - Discussion with area farmers or extension agent |
| B. Individually determine methods of controlling insects - complete lab exercise. |
| C. Study insect specimens for identification. |
| D. If possible apply insect control measures to school crop demonstration or on other local crop. Use 1 or 3 gal. spray - outfit |
| E. Complete lab exercise on names of chemicals and their dilution and time of application. |

### EVALUATION PROCEDURES

| A. Weed identification test. |
| B. Written or oral test on methods of controlling selected weeds. |
| C. Observe the students practicing changing nozzles and pressure and checking PSI and gallonage applied. |
| D. Field trip to observe results of weed spraying - students write a field trip report. |

| A. Insect identification |
| B. Written or oral test on chemicals and/or methods of controlling selected insects. |
| C. Class to make field observation if practical. |
| D. Oral test on nozzles PSI - Dilution and timing. |
| E. Oral questions on results of field observations or written field trip report. |
### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective #9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify five diseases that may affect crop production and indicate one effective method of controlling each.</td>
</tr>
</tbody>
</table>

### CONTENT

**A. Field crop diseases**
- Symptoms
- Method of control
- Fungicides available
- Forms
- Application - methods
- Timing

**Unit 6 - Crop Records**

**Objective #10**
Keep to the instructor's satisfaction, cost, materials, and labor records for the crop(s) grown.

### Unit 6 - Crop Records

<table>
<thead>
<tr>
<th>Objective #10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keep to the instructor's satisfaction, cost, materials, and labor records for the crop(s) grown.</td>
</tr>
</tbody>
</table>

### A. Cost records
- Seed bed preparation
- Planting cost
- Fertilizer cost
- Seed cost
- Chemical cost
- Cultivating cost
- Harvesting cost
- Other handling costs
- General farm expenses (overhead)

### B. Materials records
- Amounts of all materials used
- Name and grade of all materials used

### C. Labor records
- Types of labor
- Hours of labor
- Cost of labor

### D. Field observation records
- Observations of deficiencies, weeds, insects or diseases.
- Plant populations

### E. Methods of keeping records
### TEACHING METHODS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>A.</td>
<td>Group consensus to determine major field crop diseases in the area. Use pictures - slides - mounts.</td>
</tr>
<tr>
<td>B.</td>
<td>Supervised study to determine effective control measures. Use work sheets made by teacher.</td>
</tr>
<tr>
<td>C.</td>
<td>Student discussion of work sheets.</td>
</tr>
<tr>
<td>D.</td>
<td>Student practice of disease identification.</td>
</tr>
<tr>
<td>E.</td>
<td>Field trip to farmer who has disease problems. Invite a custom applicator to class for a discussion on diseases.</td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>A.</td>
<td>Determine diseases affecting area by:</td>
</tr>
<tr>
<td></td>
<td>. Memory of past problems</td>
</tr>
<tr>
<td></td>
<td>. Discussion with area farmers or extension agent</td>
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<tr>
<td></td>
<td>. Field study of current situation if possible.</td>
</tr>
<tr>
<td>B.</td>
<td>Individually determine methods of controlling area crop diseases and report on work sheet and hold class discussion.</td>
</tr>
<tr>
<td>C.</td>
<td>Study disease specimens or pictures for identification; make a collection if possible</td>
</tr>
<tr>
<td>D.</td>
<td>If possible apply disease control measures to school crop demonstration or observe custom operator in action.</td>
</tr>
</tbody>
</table>

### EVALUATION PROCEDURES

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A.</td>
<td>Disease identification</td>
</tr>
<tr>
<td>B.</td>
<td>Written or oral test on controlling selected crop diseases.</td>
</tr>
</tbody>
</table>

---

A. Students will keep information on crop throughout module and record it at the end of the module. Use system recommended by Cornell IMS Service and ATANY. 
B. Students will observe different crop record forms which can be displayed in class. 

---

A. Evaluate students completed records. 
B. Written test on crop cost account project.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #11</td>
<td>A. Steps to solving problem to solve.</td>
</tr>
<tr>
<td></td>
<td>B. Identifying problem to solve.</td>
</tr>
<tr>
<td></td>
<td>Examining problem to solve.</td>
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<tr>
<td></td>
<td>Determining amount and analysis of fertilizer</td>
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<tr>
<td></td>
<td>Determining tillage methods</td>
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<tr>
<td></td>
<td>Determining row spacings - plant population</td>
</tr>
<tr>
<td>Use the problem solving method to solve a given problem related to the growing of a specific crop using necessary references.</td>
<td></td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>---------------------------------------------------------</td>
</tr>
<tr>
<td>A. Lecture - discussion to present background information.</td>
<td>A. Record information needed to solve the problem</td>
</tr>
<tr>
<td>B. Teacher develop work sheets with problems.</td>
<td>B. Individually use the problem solving method</td>
</tr>
<tr>
<td></td>
<td>the problems on the home farm, cooperative farm or school demonstration plot.</td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - GROWING THE CROP

RESOURCE MATERIALS

A. Periodicals -
- DeKalb Crop Management
- Successful Farming - Soils and Crops
- Crops and Soils - agronomy society

B. Bulletins -
- Our Land and Its Care - American Potash Inst.
- Cornell Recommends for Field Crops Current Issue
- Cornell Recommend for Vegetable Crops - U.S.D.A.
- Doane's Farm Management Guide
- Field and Crop Record - Cornell bulletin (25c)
- Spring Grains for New York State - Cornell #E1181
- Birdsfoot Trefoil - Cornell #E111D
- Common Foliar Diseases of Alfalfa and Clover - Cornell E1205
- Forages: Production Utilization, Harvesting - Cornell S39
- Potash on Alfalfa Pays - Cornell S81
- Hunger signs in Crops - Cornell IMS $.15
- Minimum Tillage - Cornell IMS $.15
- Weed Control - Cultural and Chemical - Cornell IMS $2.00
- Demonstrations in Farm Crops - Cornell IMS - $1.40

C. Books -
- Hunger Signs and Crops
- Farm Management Handbook 1967 - Cornell Agricultural Economics

D. Audio-Visual -
- DeKalb film strips on Limiting Factors
- American Potash Institute Slides Fertilizer deficiencies
- DeKalb corn achievement forms
- Specimens of weeds, insects and diseases
- Farm Business Chart
- Fundamentals of Plant Identification 18 color slides and script - Cornell IMS $12.25
- Worksheets for slide set - $.25
- Weeds Identification and Control - 77 slides - Cornell IMS - $12.25
- Identification of weeds parts 1+2 - Cornell IMS - $5.15
- Know Your Weeds - Cornell IMS - $15.30
- See IMS catalog for other aids

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Sample of a Worksheet
Fertilizer Applications
Plans of four farmers in our area.

Spring 1973

James Post & Sons

1. Corn on alfalfa sod
   400 lbs of 10-10-10

2. Sweet corn on alfalfa
   15 loads of cow manure
   400 lbs of 10-10-10
   Total nutrients for corn

3. Oats
   200 lbs of 10-10-10

Arnold Duppengieser & Sons

1. Corn
   400 lbs of 32% N. solution
   Total nutrients for corn

2. Oats
   200 lbs of 10-20-20

Gordon Richards & Son

1. Corn
   400 lbs of 15-15-15
   Total nutrients for corn

2. Corn
   Plow down
   250 lbs of 15-15-15
   60 lbs of NH₄NO₃
   Total nutrients

Van Slykes in Gavelle Twp.

1. Corn
   200 lbs of urea
   100 lbs of muriate
   125 lbs of 18-46-0
   Total nutrients

<table>
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</table>
MODULE OF INSTRUCTION

Title - HARVESTING FIELD CROPS

Description:

Students will develop skills in selecting weather conditions favorable to harvesting, determining optimum time to harvest crops, selecting, preparing and adjustment equipment for harvest crops. Students will analyze modern grain and forage crop harvesting systems.

The safe and efficient operation of harvesting equipment will be studied by students. Machinery and equipment adjustments for optimum efficiency will be discussed.

Major Divisions or Units of Content

<table>
<thead>
<tr>
<th>Time Allocations</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Determining when to harvest field crops</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>2. Harvesting methods and procedures</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>3. Adjusting harvesting equipment</td>
<td>3/8</td>
<td>9/22</td>
</tr>
</tbody>
</table>

Revised February, 1975
MODULE OF INSTRUCTION

Title - HARVESTING FIELD CROPS

OBJECTIVES to be obtained:
The student will be able to:

1. Describe with 18% accuracy, four, four-day weather forecasts during a three week period, using all available information.

2. Correctly determine when to harvest five selected field crops to obtain maximum digestible nutrients per acre.

3. List five modern methods used to harvest field crops and list the machinery required for each method.

4. Use the problem solving method to select and justify, to the instructor's satisfaction, equipment used to harvest a crop in a given situation.

5. Determine, to the instructor's satisfaction, the amount of crop loss during harvesting, in a given situation.

6. Perform three adjustments on five harvesting machines to decrease the amount of crop left in the field.
### Objectives by Unit

**Unit 1 - Determining when to harvest field crops**

**Objective #1**
Describe with 80% accuracy four, four-day weather forecasts during a three-week period using all available information.

**Objective #2**
Correctly determine when to harvest five selected field crops to obtain maximum digestible nutrients per acre.

### Content

#### A. Sources of weather information
- Television
- Radio
- Newspaper
- U.S. weather bureau - telephone
- Visual observation
- Other

#### B. Interpreting weather information
- Reading weather maps
- Identifying clouds and their effect
- Interpreting barometric pressure changes
- Interpreting humidity readings
- Evaluating satellite pictures
- Predicting frontal movements

#### C. Agricultural weather forecasting
- Applying information to local situation

#### A. Effect of maturity on digestible nutrients per acre
- Corn silage
- Hay
- Grain
- Haylage

#### B. Measuring maturity in field crops
- Stage of flowering
- Stage of seed development
- Moisture content
- Color
- Total yield
- Digestibility
- Other
### Harvesting Field Crops

#### Teaching Methods

| A. Lecture discussion to present information |
| B. Demonstrations on interpreting weather information |
| C. Outdoor classes to obtain weather readings |
| D. Student practice using equipment and information to forecast weather. |

#### Student Application Activities

| A. Take notes on new information |
| B. Use information to make weather forecasts for four four-day periods |

#### Evaluation Procedures

| A. Evaluate student forecasts for accuracy. |
| B. Written test on key words used in her forecasting. |

| A. Students practice determining when to harvest various crops. |
| B. Students use references to calculate nutrient differences at various stages of maturity for various crops. |

| A. Test students ability to determine if given crops should be harvested either on field trips or from samples in class. |
**Unit 2 - Harvesting Methods and Procedures**

**Objective #3**
List five modern methods used to harvest field crops and list the machinery required for each method.

**Objective #4**
Use the problem solving method to select and justify, to the instructor's satisfaction, equipment used to harvest a crop in a given situation.

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Factors to consider in selecting methods of harvesting crops.</strong></td>
</tr>
<tr>
<td>Cost per acre harvested</td>
</tr>
<tr>
<td>Use of the crop</td>
</tr>
<tr>
<td>Equipment available</td>
</tr>
<tr>
<td>Time required</td>
</tr>
<tr>
<td>Field loss acceptable</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td><strong>B. Methods of harvesting field crops</strong></td>
</tr>
<tr>
<td>Making hay</td>
</tr>
<tr>
<td>Making haylage</td>
</tr>
<tr>
<td>Use of the crop</td>
</tr>
<tr>
<td>Chopping</td>
</tr>
<tr>
<td>Harvesting grain</td>
</tr>
<tr>
<td>High moisture corn</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td><strong>C. Equipment required for various methods of harvesting</strong></td>
</tr>
</tbody>
</table>

**A. Steps in problem solving method**

**B. Description of situation (should be an actual situation)**
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture discussion to present information</td>
<td>A. Students take note of new information.</td>
<td>A. Written test listing 5 modern methods of harvesting crops.</td>
</tr>
<tr>
<td>B. Problem solving method to demonstrate the process of selecting a harvesting method.</td>
<td>B. Students assist in problem solving method.</td>
<td>Machinery required for each method.</td>
</tr>
<tr>
<td>C. Individual supervised study student reporting to determine the equipment required for harvesting method.</td>
<td>C. Each student select a method of harvesting crops and determine all the equipment that could be used to harvest it then report findings to class.</td>
<td>B. Written reports on methods used to harvest forages and grains on the home farm.</td>
</tr>
<tr>
<td>D. Field trip(s) to farm or machinery dealership.</td>
<td>D. Observe equipment and its uses during field trip(s).</td>
<td></td>
</tr>
</tbody>
</table>

| A. Individual instruction | A. Solve given problem during supervised study | A. Evaluate student's completed problem. |
| B. Supervised study | | B. Oral report regarding a specific crop and situation. |

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### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective #5</th>
<th>Determine to the instructor's satisfaction, the amount of crop loss during harvesting, in a given situation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective #6</td>
<td>Perform three adjustments on five harvesting machines to decrease the amount of crop left in the field</td>
</tr>
</tbody>
</table>

### CONTENT

A. Types of crop loss during harvesting
   - Crop left standing
   - Crop cut then dropped by harvester in field
   - Losses from cutting too high
   - Losses between field and storage area

B. Measuring field loss
   - Estimate total crop - sample and weigh a given area.
   - Sample and weigh amount left in given representative area after harvesting.
   - \( \text{Amount left} \times \frac{100}{\text{total amount}} = \% \text{ loss} \)

C. Determining causes of field loss
   - Improper equipment adjustment
   - Improper equipment operation
   - Defective equipment
   - Crop too mature
   - Weather conditions
   - Other

A. Adjusting harvesting to decrease field loss (using operators manuals)
   - Speed changes
   - Sharpening cutters
   - Adjusting pickup teeth
   - Adjusting fans, sieves, and shakers
   - Adjusting knotters
   - Adjusting rollers
   - Other

B. Using operators manual to troubleshoot causes of incomplete harvesting
   - Mowers
   - Rakes
   - Clippers
   - Choppers
   - Balers
   - Combines

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture discussion to present information</td>
<td>A. Take notes on new information</td>
<td>A. Have students determine field loss in a crop working in teams of two.</td>
</tr>
<tr>
<td>B. Demonstration of technique and calculations</td>
<td>B. Practice determining crop losses during field trips and/or home farm</td>
<td></td>
</tr>
<tr>
<td>C. Student practice on field trips.</td>
<td></td>
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</tr>
</tbody>
</table>

**A. Demonstration of adjustments on farms or at dealerships**

**B. Student practice**

**C. Films showing machinery adjustments and operations.**

**D. Adult farm field days to demonstrate harvesting:**
- Hay
- Haylage
- Cornsilage
- High moisture corn
- Ear corn
- Small grains

**A. Students practice making adjustments on harvesting machinery in the field.**

**B. Calculate decrease in field loss after making adjustments.**

**A. Observe students as they make adjustments - use a check sheet to record each students progress.**

**B. Written report on major types of equipment used for specific crop enterprises. Students should explain the major adjustments and key points in operating the equipment.**
RESOURCE MATERIAL:

A. Periodicals -

Soils and Crops
Successful Farming - Soils and Crops

Books -

Doanes Farm Management Guide.
Combines and Combining, Ohio, available from IMS for $2.05

Audio-Visual -

Slides - American Potash Institute
Wheat Grading Factors, Oat Kernel Damage, Corn Kernel Damage
colored pictures from IMS - 10c each

B. Bulletins -

Cornell Extension bulletins: #E1059, #1107, S39, S67
Operators Manuals for Harvesting Equipment
MODULE OF INSTRUCTION

Title - STORING THE FIELD CROP  

Code - 01.01020103-04

DESCRIPTION:

The farmer must insure that he has adequate storage facilities to store the crops he produces. He must select the storage facility that will maintain the quality of feed stored. Crops must be protected from weather damage, excessive moisture, heat build-up, and rodents. The student will investigate the types of bins, cribs, and storage facilities as each is related to a specific crop. The advantages and limitations of storage facilities will be investigated. The economics involved in selecting storage facilities will be emphasized.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Selecting Storage Facilities</td>
<td>Class</td>
</tr>
<tr>
<td>2. Hazards Encountered in Storing Crops</td>
<td>3</td>
</tr>
<tr>
<td>3. Methods of Storing Field and Forage Crops</td>
<td>3</td>
</tr>
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<td>3</td>
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<td></td>
<td>9</td>
</tr>
</tbody>
</table>

Revised April 1974
MODULE OF INSTRUCTION

Title - STORING THE FIELD CROP

OBJECTIVES to be obtained:

The student will be able to:

1. Correctly recommend and describe, to the instructors satisfaction, five types of facilities used to store field crops grown in the local area. Determine relative costs and returns of five types of storage facilities.

2. Correctly calculate the volume and weights of crops in storage areas shaped as a square, rectangle, pyramid, cylinder, cone or irregular given the dimensions of the structure and unit weights of the crop.

3. Use the problem solving method to correctly select safe, protective, and economical storage facilities for given field crops in a given situation.

4. List ten safety hazards associated with storing selected field crops, and describe the preventative steps that may be taken for each hazard listed.

5. Demonstrate to the instructors satisfaction, ability to properly perform the mechanical operations involved in storing hay, silage, and grain in their respective structures.

6. Demonstrate to the instructors satisfaction the ability to make at least ten recommended adjustments on equipment used in the process of storing field crops.

7. Determine the relative quality of silage, hay, and grain taken from storage facilities given several samples.
## OBJECTIVES BY UNIT

### Unit 1 - Selecting storage facilities

**Objective 1**
Correctly recommend and describe, to the instructors satisfaction, five types of facilities used to store field crops grown in the local area. Determine the relative costs and returns of five types of storage facilities.

<table>
<thead>
<tr>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td><strong>A. Types of storage facilities</strong></td>
</tr>
<tr>
<td>Mow storage</td>
</tr>
<tr>
<td>Silos</td>
</tr>
<tr>
<td>Upright</td>
</tr>
<tr>
<td>Air tight</td>
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<tr>
<td>Conventional</td>
</tr>
<tr>
<td>Trench</td>
</tr>
<tr>
<td>Bunker</td>
</tr>
<tr>
<td>Corn cribs</td>
</tr>
<tr>
<td>Bins</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

| B. Construction of storage facilities       |
| Materials used                              |
| Strength                                     |
| Longevity                                    |
| Versatility                                  |
| Protection given stored crop                |
| Other                                        |

<p>| C. Advantages and limitations of types of storage facilities |
| Cost per unit of crop stored                  |
| Keeping quality of contents                   |
| Ease of handling materials                    |
| Versatility of structure                      |
| Deterent to rodents and pests                 |
| Other                                         |</p>
<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and discussion to present new information.</td>
<td>A. Take notes on new information presented.</td>
<td>A. Written and/or oral test.</td>
</tr>
<tr>
<td>B. Supervised study and student reporting.</td>
<td>B. Select a storage facility and use references to find information concerning structure (A-H) and advantages and limitations (A-H) then report findings to the class.</td>
<td>B. Write report on field trips.</td>
</tr>
<tr>
<td>C. Visit farmer who likes glass lined silos.</td>
<td>C. Take notes on field trip.</td>
<td>C. Instructors to checks students' progress in this study. Grade notebooks.</td>
</tr>
<tr>
<td>E. Visit a farm where there is new construction - storage.</td>
<td>E. Determine the cost to go from a mow system to an all haylage (silo) system including - automatic unloaders and feeders.</td>
<td></td>
</tr>
<tr>
<td>F. Visit a farm that has no silos - hay is stored in mow.</td>
<td>F. Students make notations and comparisons - list types of storages - and under each give - advantages, disadvantages.</td>
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<tr>
<td>G. Teacher to get cost data for storage facilities for silages and for grains.</td>
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<td></td>
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<tr>
<td>H. Invite resource people in Extension Service and field men from companies that sell storage facilities and equipment.</td>
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<td></td>
</tr>
</tbody>
</table>
## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective 2</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correctly calculate the volume and weights of crops in storage areas shaped as a square, rectangle, pyramid, cylinder, cone or irregular given the dimensions of the structure and unit weights of the crop.</td>
<td></td>
</tr>
</tbody>
</table>

### A. Finding Volumes of storage Facilities (Pages 53-64: Arithmetic in Agriculture):
- **Square or rectangle**
  - Volume = length \( \times \) width \( \times \) height
- **Cylinders**
  - Volume = \( \pi r^2 \times \) height
- **Cones and pyramids**
  - Volume = area of base \( \times \) height \( \div \) 3
- **Irregular volumes**
  - Break into squares, rectangles, cylinders, cones or pyramids.

### B. Determining Weight of material in facilities
- **Amount** = No. of units in structure \( \times \) weight per unit.
- **Weights per unit of crops** as found in references - Farm Management Handbook (Cornell) or Arithmetic in Agriculture.
- Sample calculating found in references.

<table>
<thead>
<tr>
<th>Objective 3</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use the problem solving method to correctly select safe, protective, and economical storage facilities for given field crops in a given situation.</td>
<td></td>
</tr>
</tbody>
</table>

### A. Steps in problem solving method
- **B. Factors to consider in selecting storage facilities from Objective 1**
- **C. Information pertinent to problem students will solve - preferably an actual situation.**
### TEACHING METHODS

| A. | Lecture-discussion to present information. |
| B. | Demonstration to show methods. Teacher use overhead projector for calculations. |
| C. | Student practice solve problems. |
| D. | Field trip to determine volume of storage area. |

### STUDENT APPLICATION ACTIVITIES

| A. | Take notes of new information. |
| B. | Solve practice problem. |
| C. | Solve problems during field trip. |

### EVALUATION PROCEDURES

| A. | Written test on volume problems. |
| B. | Evaluation of problems solved on field trip. |

---

### Problem

Solve given problem using problem solving method. Assume you need storage to feed herd of 100 dairy cows plus replacements. Determine hay equivalent needed per cow - total tons storage needed - determine crops to be grown, yields and storage capacity needed.

Evaluate results of problem student has solved.

Make a chart of storage facilities on your farm and for each, give dimensions, storage capacity in tons and/or bushels.

Develop a plan for changes in storage facilities or methods you would like to see in the future.

---

415
### Title - STORING THE FIELD CROP

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 2 - Hazards encountered in storing crops.</strong>&lt;br&gt;Objective 4&lt;br&gt;List ten safety hazards associated with storing selected field crops, and describe the preventative steps that may be taken for each hazard listed.</td>
<td><strong>A. Safety hazards in storing field crops.</strong>&lt;br&gt;. Sources of information about potential hazards&lt;br&gt;. operators manuals&lt;br&gt;. bulletins&lt;br&gt;. periodicals&lt;br&gt;. farmers&lt;br&gt;. agencies - extension, safety councils&lt;br&gt;. personal experience&lt;br&gt;. other&lt;br&gt;. Types of Hazards&lt;br&gt;. running machinery&lt;br&gt;. falls&lt;br&gt;. poisonous gases&lt;br&gt;. fires&lt;br&gt;. suffocation&lt;br&gt;. respiratory infections from dust&lt;br&gt;. other&lt;br&gt;. Preventative steps to decrease hazards</td>
</tr>
<tr>
<td><strong>Unit 3 - Methods of storing field and forage crops.</strong>&lt;br&gt;Objective 5&lt;br&gt;Demonstrate to the instructors satisfaction, ability to properly perform the mechanical operations involved in storing hay, silage, and grain in their respective structures.</td>
<td><strong>A. Hay Storage</strong>&lt;br&gt;. Working with elevators&lt;br&gt;. Stacking hay&lt;br&gt;. Other&lt;br&gt;<strong>B. Silage storage</strong>&lt;br&gt;. Operating the blower&lt;br&gt;. Distribution of silage&lt;br&gt;. Other&lt;br&gt;<strong>C. Grain storage</strong>&lt;br&gt;. Working with elevators&lt;br&gt;. Providing ventilation&lt;br&gt;. Determining moisture content&lt;br&gt;. Other&lt;br&gt;<strong>D. Ear Corn storage</strong>&lt;br&gt;. Providing ventilation&lt;br&gt;. Controlling rodents and pests&lt;br&gt;. Other</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>------------------------------------------------------</td>
</tr>
<tr>
<td>A. Lecture - discussion.</td>
<td>A. Take notes on new information.</td>
</tr>
<tr>
<td>B. Demonstration of literature</td>
<td>B. Each student develop a list</td>
</tr>
<tr>
<td>concerned with farm safety.</td>
<td>of hazards associated with</td>
</tr>
<tr>
<td></td>
<td>crop storage on his farm,</td>
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<td></td>
<td>work experience station,</td>
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<tr>
<td></td>
<td>or a neighboring farm and</td>
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<td></td>
<td>indicate preventative steps for each hazard.</td>
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<tr>
<td>C. Resource personnel if available.</td>
<td>C. Discuss hazards and</td>
</tr>
<tr>
<td>D. Supervised study and</td>
<td>preventative steps in class</td>
</tr>
<tr>
<td>student reporting.</td>
<td>group discussion.</td>
</tr>
<tr>
<td>E. Group consensus.</td>
<td>D. Keep a classroom bulletin</td>
</tr>
<tr>
<td></td>
<td>board on accidents and farm</td>
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<tr>
<td></td>
<td>safety.</td>
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<tr>
<td>A. Demonstrations</td>
<td>A. Observe demonstrations</td>
</tr>
<tr>
<td>B. Field trips to observe and</td>
<td>B. Practice storing crops</td>
</tr>
<tr>
<td>practice proper procedure.</td>
<td>during field trips.</td>
</tr>
<tr>
<td>C. Visit custom grain drying</td>
<td>C. Observe operation -</td>
</tr>
<tr>
<td>operation</td>
<td>- Make notes on costs</td>
</tr>
<tr>
<td></td>
<td>based on moisture percentages.</td>
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<td></td>
<td>- Determine moisture content</td>
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<tr>
<td></td>
<td>of several grain samples</td>
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<td></td>
<td>brought in by students.</td>
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<tr>
<td>D. Teacher prepare work sheet</td>
<td>D. Determine value of storing</td>
</tr>
<tr>
<td>that will illustrate the returns</td>
<td>grain vs. selling it at</td>
</tr>
<tr>
<td>that may be gained by storing grain</td>
<td>harvest. Consider ASCS -</td>
</tr>
<tr>
<td>and selling next spring.</td>
<td>government loan storage.</td>
</tr>
<tr>
<td>OBJECTIVES</td>
<td>CONTENT</td>
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<tr>
<td>------------</td>
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</tr>
<tr>
<td>Objective 6</td>
<td>Adjustments on equipment as given in operators manual.</td>
</tr>
<tr>
<td></td>
<td>- Drying fans</td>
</tr>
<tr>
<td></td>
<td>- Elevators - hay, auger and paddle type</td>
</tr>
<tr>
<td></td>
<td>- Unloading wagons</td>
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<td></td>
<td>- Forage blowers</td>
</tr>
<tr>
<td></td>
<td>- Forage harvestors</td>
</tr>
<tr>
<td>Objective 7</td>
<td>Factors to consider in evaluating field crop quality.</td>
</tr>
<tr>
<td></td>
<td>- Maturity of sample</td>
</tr>
<tr>
<td></td>
<td>- Color</td>
</tr>
<tr>
<td></td>
<td>- Odor</td>
</tr>
<tr>
<td></td>
<td>- Freedom of disease or insect damage</td>
</tr>
<tr>
<td></td>
<td>- Freedom of weather damage</td>
</tr>
<tr>
<td></td>
<td>- Foreign particles present</td>
</tr>
<tr>
<td></td>
<td>- Size of sample</td>
</tr>
<tr>
<td></td>
<td>- Digestibility and nutrient content - (forage testing)</td>
</tr>
<tr>
<td></td>
<td>- Other</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>A. Demonstration</td>
<td>A. Observe and take notes during demonstrations.</td>
</tr>
<tr>
<td>B. Student practice on home farm or cooperative farm.</td>
<td>B. Practice making adjustments recommended in operator's manuals.</td>
</tr>
<tr>
<td>C. Field trips.</td>
<td></td>
</tr>
</tbody>
</table>

- A. Lecture-discussion to present factors to consider.
- B. Demonstration of differences.
- C. Student practice at evaluating quality.
  - Visit a farmer or borrow his reports on complete analysis of several of his feeds.
- D. Use IMS sheet - Forage Crop Judging (FFA Contest) - and set up a lesson in judging.
- E. Use IMS sheet on wheat - oat or corn kernel damage.
- F. Lab exercise on determining quality of roughages and grains.

A. Take notes on factors to consider in evaluating crop samples.
   - B. Practice determining relative quality of crop samples.
   - C. Send sample for complete analysis to college of agriculture - Study the report.
   - D. Discussion of samples set up by teacher after student evaluation.
   - E. Observe pictures shown and quality of grains - make a list of U.S.D.A. grades for two grains - get prices on different grain grades.

A. Crop sample placement test based on quality.
   - B. Use IMS Sheet Forage Crop Judging.
   - C. Oral exam on what a complete feed analysis shown.
   - D. Judge 10 samples of forages and/or grains. Use FFA Forage Crop Judging Sheets.
MODULE OF INSTRUCTION

Title - STORING THE FIELD CROP

RESOURCES MATERIAls

A. Periodicals - Soils and Crops
   Successful Farming - Soils and Crops and Harvesting issues
   Farm Safety - Rural Safety Council

B. Books -
   Doanes Farm Management Guide.
   Farm Management Handbook - Cornell
   "Arithmetic in Agriculture" - Interstate Printers and Publishers

C. Audio-Visalis -
   Wheat grading Factors, Oat kernel damage, corn kernel damage,
   colored pictures from I.M.S., $10 each
   Slides - American Potash Institute
   Slides - Harvesting and Storing Medium Moisture Hay Crop
   Silage, 30 slides - $5.75 - I.M.S.
   Harvesting and Storing High moisture Corn -
   38 slides - $6.00 - I.M.S.

D. Bulletins -
   Operator's Manuals for equipment used in teaching module.
   Cornell Extension Bulletins #0008, E1057, E373, E994, E353.
   Drying Shelled Corn - $20 from I.M.S.
   IMS - Cornell - Forage Crops Judging Sheet - FFCA Contest Form
   used at State Fair.
Plan a new storage facility for this farmer who is unhappy using a bunker silo for silage and he has lost his labor force who has helped him mow hay.

He plans to grow:
A. 150 acres of corn - for silage
B. 50 acres of corn - for grain
C. 150 acres of corn - for alfalfa hay
D. 50 acres of corn - for oats

Using top 10% yields from Cornell Business Analysis Sheet - develop an upright silo system for:
- a) Corn silage
- b) Corn grain (high moisture)
- c) Haylage
- d) Grain (steel bin)

Assume dry hay will be used in feeding young calves to one year of age.

Alternatives - determine advantages and limitations of each. He will use two self unloading wagons to do the feeding in a bunk.

<table>
<thead>
<tr>
<th></th>
<th>Harvestor</th>
<th>Concrete Stove</th>
<th>Steel Bin</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>tons storage</strong></td>
<td>= $</td>
<td>=</td>
<td>=</td>
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<tr>
<td>** tons storage**</td>
<td></td>
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<tr>
<td>** Glass lined silo system **</td>
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<tr>
<td>** Combination - harvestor - concrete stove or continuous poured concrete silos - unloaders included **</td>
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<tr>
<td>** All concrete silos **</td>
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</tr>
<tr>
<td>** All wood silos **</td>
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</tbody>
</table>

Oats

421
Storing the Field Crop Lab Worksheet Field Trip Objective #1

NAME OF STUDENT

1. Farm of ________________________________ Visited ___________________________ (DATE)

2. Kind of operation dairy beef cash crop other.

3. Animals carried next fall and winter -  
   ___________________ cows  ___________________ replacements  
   ___________________ animals  ___________________ other

4. Crops grown past growing season -  

<table>
<thead>
<tr>
<th>Acres</th>
<th>Name of Crop</th>
<th>Yield Acre</th>
<th>Total Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

5. Storage facilities on this farm - get sizes

<table>
<thead>
<tr>
<th>Name of Crop</th>
<th>How Stored</th>
<th>Size of Storage</th>
<th>Tonnage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</table>

6. Farmers comments - advantages and disadvantages of each facility -


422
MODULE OF INSTRUCTION

Title - WEED CONTROL IN FIELD CROPS

DESCRIPTION:

The super production of most crops is usually expected in American agriculture. For this reason our society has been able to enjoy an abundance of available nourishment exceeded by no other country in the world. Extensive knowledge in the areas of soils, fertilization, pesticides and herbicides has greatly assisted our farmers in their successful crop production.

This module deals with the control of weeds through proper tillage and use of herbicides.

The student will be involved with weed identification and categorization and the selection of chemical and mechanical weed control methods available today to facilitate greater production.

Emphasis will be placed upon proper selection of herbicides and safe handling of the chemicals and equipment used in weed control.

<table>
<thead>
<tr>
<th>MAJOR DIVISIONS OR UNITS OF CONTENT</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Identification of weeds</td>
<td>2</td>
</tr>
<tr>
<td>2. Mechanical weed control</td>
<td>0</td>
</tr>
<tr>
<td>3. Chemical weed control</td>
<td>1</td>
</tr>
<tr>
<td>4. Safe use of machinery and chemicals</td>
<td>$\frac{1}{4}$</td>
</tr>
</tbody>
</table>

Revised April, 1974
OBJECTIVES to be obtained:

The student will be able to:

1. Prepare a working definition of the term Weed.

2. Prepare a list of 25 weeds common to the area and categorize each as a broad or narrow leaf variety and whether they are annuals, biennials or perennials.

3. Collect and preserve 15 different specimens of weeds found in the area.

4. Identify, by using a key, and to the instructor's satisfaction each of 15 specimens collected.

5. List and compare reasons for using mechanical weed control.

6. List ten different chemicals used to control weeds and note any government regulations pertaining to each.

7. Make a chart including each of the ten chemicals in Objective 5 and show which weeds each is effective against and the crops each protects.

8. Select a control which has been proven effective on each of the 15 specimens collected and note the proper stage of growth to apply the control.

9. List and demonstrate 15 precautions to use when working with weed control chemicals and machinery.

10. Calibrate to the instructor's satisfaction a sprayer which will be used to apply a herbicide.

11. Demonstrate to the instructors satisfaction the procedure to use when applying a chemical herbicide.
# Objective 1
Prepare a working definition of the term Weed.

## Objective 2
Prepare a list of 25 weeds common to the area and categorize each as a broad or narrow leaf variety and whether they are annuals, biennials or perennials.

## Objective 3
Collect and preserve 15 different specimens of weeds found in the area.
### TEACHING METHODS

<table>
<thead>
<tr>
<th>A. Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Supervised study of weeds</td>
</tr>
<tr>
<td>- Weeds--presentation of filmstrips, mounts, slides, movies.</td>
</tr>
<tr>
<td>- Weeds--of the North Central States--go through 20 pictures and point out difference in structure.</td>
</tr>
<tr>
<td>- Develop vocabulary on leaf characteristics.</td>
</tr>
</tbody>
</table>

| A. Supervised study |
| B. Slide presentation |
|   - Weed Identification and control |
|   - film strips |
| C. Classroom mounts |
| D. Slides made by teacher |
| E. Weed charts |

| A. Supervised collection |
| B. Field trip |
| C. Teacher demonstrate collection and preservation |
| D. Weed charts |

### STUDENT APPLICATION ACTIVITIES

| A. Write notes in notebook |
| B. Write definitions from three different references in notebook and from these three extrapolate a definition which can be used in weed control. |
| C. Make drawings of--leaf characteristics from new vocabulary. |

| A. Use Cornell IMS - FFA Contest Field & Forage and Vegetable Crop - Weed sheets to select the weeds to use |
|   - Check those known by student first |
|   - Question farmers and herbicide sales companies to acquire the weeds most common to the area. |
| B. Observe slides, pictures or mounts and learn special characteristics as pointed out in class discussion. |

A. Select and collect different weeds discovered on the field trip. (use newspaper or magazines)  
B. Preserve specimens for further use and observation.  
C. Student collection of weeds from home farms or demonstration area.

### EVALUATION PROCEDURES

| A. Collect and evaluate each student's definition. |
| B. Notebook evaluation |

| A. Teacher and student evaluation of the list compiled. |
| B. Written quiz at end of each period. Final quiz on 25 weeds. Use IMS forms. |

<p>| A. Teacher evaluation of collection and preservation. |</p>
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 4</td>
<td>A. Weed identification key</td>
</tr>
<tr>
<td>Identify by using a key and to the instructors satisfaction each of 15 specimens collected.</td>
<td>. Leaf shapes</td>
</tr>
<tr>
<td></td>
<td>. Leaf sizes</td>
</tr>
<tr>
<td></td>
<td>. Colors</td>
</tr>
<tr>
<td></td>
<td>. Stem shapes</td>
</tr>
<tr>
<td></td>
<td>. Presence of hairs</td>
</tr>
<tr>
<td>B. Identification of common weeds</td>
<td>. Agri-business company charts</td>
</tr>
<tr>
<td>Objective 5</td>
<td>A. Tillage</td>
</tr>
<tr>
<td>List and compare reasons for using mechanical weed control.</td>
<td>B. Mulching</td>
</tr>
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<td></td>
<td>C. Mowing</td>
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<tr>
<td></td>
<td>. Time</td>
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<tr>
<td></td>
<td>. Cost</td>
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<tr>
<td></td>
<td>. Results</td>
</tr>
<tr>
<td>Objective 6</td>
<td>A. Chemicals</td>
</tr>
<tr>
<td>List ten different chemicals used to control weeds and note any government regulations pertaining to each.</td>
<td>. 2,4-D</td>
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<tr>
<td></td>
<td>. Cyanamid</td>
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<td>. Pre-emergence sprays</td>
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<td>. 2, 4-5T</td>
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<td></td>
<td>. Silvex</td>
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<td></td>
<td>. Methoxychlor</td>
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<td></td>
<td>. Paraquat</td>
</tr>
<tr>
<td></td>
<td>. Malathion</td>
</tr>
<tr>
<td>B. Safety procedures involved when working with chemicals.</td>
<td>. 4 - (2,4-DB)</td>
</tr>
<tr>
<td></td>
<td>. Ammonium sulfate</td>
</tr>
<tr>
<td></td>
<td>. Sodium arsenite</td>
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<tr>
<td></td>
<td>. Simazine</td>
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<td></td>
<td>. Amitrol-T</td>
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<td></td>
<td>. Atrazine</td>
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<td></td>
<td>. DiNitro</td>
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<td>. Dowpon</td>
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<td>. Sutan</td>
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<td>. Eptam</td>
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</tbody>
</table>

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### Teaching Methods

<table>
<thead>
<tr>
<th>A. Lecture on use of key</th>
<th>A. Note taking</th>
<th>A. Teacher evaluation of students identifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Demonstration of the use of the key</td>
<td>B. Panel discussion--three people for mechanical methods vs chemical sprays</td>
<td>A. Teacher and student evaluation of discussion</td>
</tr>
<tr>
<td>C. Supervised student use of the weed identification key</td>
<td>C. Supervised study</td>
<td>B. Written essay questions on mechanical weed control</td>
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<tr>
<td>D. Lab exercise</td>
<td>C. Prepare costs per acre for using chemicals vs mechanical tillage</td>
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</tbody>
</table>

### Student Application Activities

<table>
<thead>
<tr>
<th>A. Demonstration. Calculate cost per acre to control specific weeds in corn and forage crops. Use work sheet.</th>
<th>A. Take notes and fill in work sheet on costs. Calculate cost of various chemicals</th>
<th>A. Oral quiz on demonstration</th>
</tr>
</thead>
</table>
| B. Guest speakers  
  - Cooperating agricultural chemical companies  
  - Extension specialist | B. Note taking and questions from guest speakers | B. Have each student prepare a plan for his farm for using herbicides. Give dilutions, names of chemicals, rates of application and costs |
| C. Supervised study  
  - Use Cornell Recommends to complete a work sheet  
  - Discuss ecological aspects of herbicides | C. Prepare a list of chemicals, the weeds they control and specific regulations on each. | C. Quiz on chemical safety. |
| D. Invite field man of agribusiness to class. Discuss mechanical and chemical weed control | D. Hold class discussion on dangers of some herbicides. | |

### Evaluation Procedures

<table>
<thead>
<tr>
<th>A. Teacher evaluation of students identifications</th>
<th>A. Teacher and student evaluation of discussion</th>
<th>B. Written essay questions on mechanical weed control.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture on economics of weed control cost per acre</td>
<td>A. Oral quiz on demonstration</td>
<td>B. Have each student prepare a plan for his farm for using herbicides. Give dilutions, names of chemicals, rates of application and costs.</td>
</tr>
<tr>
<td>B. Panel discussion</td>
<td>B. Note taking and questions from guest speakers</td>
<td>C. Quiz on chemical safety.</td>
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<tr>
<td>C. Supervised study</td>
<td>C. Prepare a list of chemicals, the weeds they control and specific regulations on each.</td>
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</tr>
<tr>
<td>D. Invite field man of agribusiness to class. Discuss mechanical and chemical weed control</td>
<td>D. Hold class discussion on dangers of some herbicides.</td>
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</tbody>
</table>
### Objectives by Unit

#### Objective 7
Make a chart including each of the 10 chemicals in Objective 6 and show which weeds each is effective against and the crops each protects.

#### Objective 8
Select a control which has been proven effective on each of the 15 specimens collected and note the proper stage of growth to apply the control.

#### Unit 4 - Safe use of machinery
Objectives 9
List and demonstrate 15 precautions to use when working with weed control chemicals and machinery.

### Content

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<th>A. Chemicals</th>
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<td>. Attrex</td>
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<td>. 2,4-D</td>
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<tr>
<td>. Silvex</td>
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<td>. Eptam</td>
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<td>. Sutan</td>
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<tr>
<td>. Simazine</td>
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<tr>
<td>. Malathion</td>
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<tr>
<td>. Sodium arsenite</td>
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<tr>
<td>. Methoxychlor</td>
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<table>
<thead>
<tr>
<th>B. Weeds killed</th>
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<tbody>
<tr>
<td>C. Crop protected</td>
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<table>
<thead>
<tr>
<th>A. Categories</th>
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<tr>
<td>. Tractor operation</td>
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<td>. Calibration of equipment (residual effect)</td>
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<td>. Labeling</td>
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<td>. Storage</td>
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<th>B. Safety</th>
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<td>. Handling of chemicals</td>
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<td>. Storage of chemicals</td>
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<td>. Disposal of containers</td>
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<tr>
<th>C. Chemical applicator certification</th>
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<td>. Commercial</td>
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<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
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<tbody>
<tr>
<td>A. Supervised study common weeds</td>
<td>A. Make the chart and file in notebook</td>
<td>A. Teacher evaluation of the chart</td>
</tr>
<tr>
<td>B. Supervised study common crops grown in the area</td>
<td></td>
<td>B. Written test on 10 chemicals used to control weeds in forage and grain crops grown in the area.</td>
</tr>
<tr>
<td>C. Supervised study chemical weed controls for crops</td>
<td></td>
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<tr>
<td>D. Film strips and movies on weed control</td>
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</tr>
<tr>
<td>A. Lecture</td>
<td>A. Note taking</td>
<td>A. Teacher evaluation of chart and notes</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td></td>
<td>B. Oral quiz on major weed controls for forage and grain crops common in the area.</td>
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<td>C. Field trip to farm using herbicides</td>
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<tr>
<td>D. Slide presentation on common weed controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervised study using booklet: Agriculture Chemical Safety</td>
<td>A. Record in notebook the precautions to be used when using chemicals.</td>
<td>A. Oral or written exam on 15 precautions when using agricultural chemicals.</td>
</tr>
<tr>
<td>B. Review in discussion of safe tractor operation</td>
<td></td>
<td>B. Test on safe use of machinery when applying chemicals.</td>
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<tr>
<td>C. Equipment safety</td>
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<tr>
<td>D. Cooperative extension educational program</td>
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<tr>
<td>E. Environmental Conservation Department examination for chemical certification permits.</td>
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<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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<tr>
<td>Objective 10</td>
<td>A. Spray equipment</td>
<td></td>
</tr>
<tr>
<td>Calibrate, to the instructor's satisfaction, a sprayer which will be used to</td>
<td>B. Hand operated--small</td>
<td></td>
</tr>
<tr>
<td>apply a herbicide.</td>
<td>C. Machine operated--large</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Safety</td>
<td></td>
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<tr>
<td>Objective 11</td>
<td>A. Setting up equipment</td>
<td></td>
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<tr>
<td>Demonstrate to the instructors satisfaction, the procedure to use when applying</td>
<td>B. Check calibration</td>
<td></td>
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<tr>
<td>a chemical herbicide</td>
<td>C. Prepare chemical solutions</td>
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<tr>
<td></td>
<td>D. Safety</td>
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</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
<td>EVALUATION PROCEDURES</td>
</tr>
<tr>
<td>------------------</td>
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</tr>
<tr>
<td>A. Demonstration by teacher. Run sprayer at three different tractor road speeds and at different psi settings. Note gallonage delivered, change nozzle size and repeat above.</td>
<td>A. Observe demonstration and repeat later by student teams or groups.</td>
<td>A. Teacher evaluation of student operation.</td>
</tr>
<tr>
<td>B. Demonstration on mixing a liquid with water to get proper dilution.</td>
<td>B. Make a chart showing gal/acre delivered in six different situations using a calibrating jar.</td>
<td>B. Collect worksheets and evaluate.</td>
</tr>
<tr>
<td>C. Demonstration on mixing a wettable powder.</td>
<td>C. Observe demonstration by class members, repeat later. Have students work in small groups or teams.</td>
<td>C. Oral test on sprayer.</td>
</tr>
<tr>
<td>D. Demonstration and trouble shooting--plugged sprayer lines, tips, or bad pump.</td>
<td>D. Written test. Have students determine how much chemical and how much water is needed to spray X acres for X crop to kill X variety of weeds.</td>
<td>. Nomenclature</td>
</tr>
</tbody>
</table>

A. Observe demonstration of each type by machinery dealer, or farmer who uses this equipment.

B. Prepare a worksheet of steps to be used in operation.

C. Supervised work experience.

D. Learn parts of a sprayer, run the pump, calibrate water: expended using the calibrating jar.

A. Demonstration of use of each type by machinery dealer, or farmer who uses this equipment.

B. Prepare a worksheet of steps to be used in operation.

C. Supervised work experience.

D. Learn parts of a sprayer, run the pump, calibrate water: expended using the calibrating jar.

A. Observation of demonstration.

B. Question any poorly understood parts.

C. Complete the worksheet.

D. Label drawing, showing sprayer parts, study nozzle size, psi and output.

A. Teacher evaluation of student operation.

B. Collect worksheets and evaluate.

C. Oral test on sprayer.

D. Written test. Have students determine how much chemical and how much water is needed to spray X acres for X crop to kill X variety of weeds.

C. Performance grading on students' work in their demonstrations in applying chemical herbicides.
MODULE OF INSTRUCTION

Title - WEED CONTROL IN FIELD CROPS

RESOURCE MATERIALS

Books:
- Weed Control: as a science, Klingman, John Wiley & Sons, Inc.
- Approved Practices in Pasture Mgt., McVikar and McVikar, Interstate
- Weeds, Muenscher, Macmillan Co.
- Weeds of the North Central States, Agric. Exp. Station, Univ. of Ill., Circular 1
- Weeds of the North East, Phillips, Univ of Del., Ag. Exper. Station, Newark Delaware

Bulletins:
- Cornell Ext. Bull. 1147 - Killing Undesirable Vegetation with Chemicals
- Cornell Ext. Bull. 769 - Chemical Weeding
- Cornell Ext. Bull. 1154 - Poison Ivy, Poison Sumac
- 4-H Leaders' Guide L-10-1 Know Your Weeds
- Agway Chemical Guide - Current Year

Audio Visuals:
1. Quack Grass Control, Slide set
   IMS Cornell University, Stone Hall
2. Weed Ident. and Control, Slide Series
   IMS Cornell University, Stone Hall
3. Kodachrome Slide sets - (loan or purchase) Visuals Office
   Roberts Hall - Cornell University or Film Library
4. Weed Mounts (on loan) - Vegetable Crops Specialist
   New York State College of Agriculture
5. Movie - Battle Report - The Underground War on Weeds
   Public Relations Department - Elanco Products Co. P.O. Box 1968
   Indianapolis, Indiana 46206

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Operation of a Low Gallonage Sprayer
Lab Work Sheet

Example

1. A low gallonage sprayer will deliver about ____ to ____ gallons of water per acre.
2. An _______ is used to keep chemicals in suspension.
3. A _______ will keep foreign particles out of the pressure lines.
4. The pumps are made of ______________________ (material).
5. In an 8004 tip the first 80 stands for ________.
6. Extra solution that doesn't go to the nozzles is fed back to the tank through a ________ ________ ________.
7. A _______ is held within the female body of a nozzle.
8. Atrazine is used to ______________________ in ________ (crop).
9. 2, 4-D is used to ______________________ in ________ (crop).
10. Chemical which will control mosquitoes around the home
11. _______ ounces of this chemical to _______ gal water is a good dilution for insect control.
12. _______ is a chemical which will clean out a sprayer with 2, 4-D residue.
13. _______ will clean out a sprayer that had atrazine in it.
14. 15, 16 - List below three separate ways to control amount of solution applied per acre.
15. _______ a kind of metal that will not corrode.
16. The 200 gal. tank we saw was made of ________
17. When using a calibrating jar - a practice runway ________ feet long is used as a test strip.
18. If I want to apply 40 gallons of solution per acre I must use __________ tip at ______ lbs psi at ______ mph.
(See a booklet.)
1. Name the material used to control broad leaved weeds in corn and in lawns.

2. An 8004 tip means something. What does the first 80 mean?

3. What does the 04 mean?

4. The amount of liquid applied per acre increases or decreases as the tip is changed from an 8002 to an 8004 tip.

5. Name the material which will control grasses in corn?

6. In what form does his material come in?

7. In what form is it applied?

8. To get a solution down close to the corn weeds are used on the sprayer.

9. In calibrating a sprayer a strip rods long is used.

10. A jar is used to measure the amount of liquid being applied.

11. The spacing between the nozzles may be _____ or _____ inches.

12. The sprayer we used yesterday sprayed the solution in a broadcast or bands.

13. One gallon of water weighs about _____ lbs while one gallon of liquid nitrogen weighs _____ lbs.

14. If I sprayed 18 gallons of liquid nitrogen per acre how many pounds of this material was I putting on per acre?

15. If liquid nitrogen tests 32% how much actual nitrogen was I putting on in problem 14 above?

16. What kinds of material should I use to remove the 2, 4-D residue from a tank which I want to use to spray beans for insects?

17. How can I remove atrazine residue from a tank which I want to clean so I can spray alfalfa for insects. Atrazine residue will kill alfalfa.

18. A farmer chooses to spray corn for grasses before the corn is up this is called a treatment.

19. The sprayer we used yesterday will spray any liquid. Name three kinds of different materials which may be sprayed out.

20. On the back of this sheet solve for the following problems:

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Continued

a. What nozzle size, mph, and psi will I need to apply 300 lbs of liquid N per acre?

b. What nozzle size, mph, and psi will I need to apply 12 gal. of water and 1 pint of 2, 4-D per acre?

c. I want to get a tank of atrazine ready for 20 acres of corn. How much water will I need to put into the tank. How much atrazine will I need to put into the tank?
MODULE OF INSTRUCTION

Title - THE CULTURAL AND MANAGEMENT PRACTICES OF THE APPLE ORCHARD

Code - 01.01020105-01

DESCRIPTION:

The apple producer must always keep his orchard healthy to produce at maximum capacity. Trees that no longer produce must be removed and new trees established. Students will be involved with the selection of apple varieties, planting systems and rootstocks based on soil and climatic conditions. They will develop plans to maintain orchard nutrition and practice method of pollination, pruning, training and tree propagation.

MAJOR DIVISIONS OR UNITS OF CONTENT

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<th>Time Allocations</th>
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<td>Class</td>
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<td>1. Planting systems and rootstocks</td>
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<tr>
<td>2. Variety Selection</td>
<td>2</td>
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<tr>
<td>3. Fruit Tree Nutrition and Orchard Soils</td>
<td>2</td>
</tr>
<tr>
<td>4. Basic Pollination Procedures</td>
<td>1</td>
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<tr>
<td>5. Pruning and Training</td>
<td>2</td>
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<tr>
<td>6. Basic methods of tree propagation</td>
<td>1</td>
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<tr>
<td>7. Orchard Pest Control</td>
<td>1/12</td>
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</tbody>
</table>

Revised March, 1975
MODULE OF INSTRUCTION

Title - THE CULTURAL AND MANAGEMENT PRACTICES OF THE APPLE ORCHARD

OBJECTIVES to be obtained:

The student will be able to:

1. Evaluate orchard planting systems and select a planting system based upon given conditions.
2. Compare characteristics of common rootstocks and make selections based upon managerial factors.
3. Identify primary varieties of apples and make selections for local planting.
4. Identify the physical characteristics of orchard soils.
5. Identify physical limitations of orchard soils and be able to make recommendations for improving drainage.
6. Take soil samples, interpret the results of a comprehensive soil analysis and make necessary recommendations for nutrient requirements.
7. Develop a pollination schedule.
8. Prune young and established trees.
9. Reproduce demonstrated methods of grafting.
10. Discuss additional methods of tree propagation
11. Make pest control recommendations based upon accepted standards and outline a program for the orchard*

* Additional pest control covered in modules 01.01020105-2 (Controlling Apple Diseases) and 01.01020105-3 (Controlling Apple Insects)
## OBJECTIVES BY UNIT

### Unit 1 - Planting systems and rootstocks

**Objective #1**
The student will be able to evaluate orchard planting systems and select a planting system based upon given conditions.

**Objective #2**
The student will be able to compare characteristics of common rootstocks and make selection based on managerial factors.

### Unit 2 - Selection of apple varieties

**Objective #3**
The student will be able to identify primary apple varieties and make selections for local planting.

## CONTENT

### A. Location of Orchards

- Climatic factors
  - temperature
  - wind
  - sun
  - hail
  - rainfall
- Topographic factors
  - air flow
  - buffers

### B. Planting Systems

- Low Density (75-150 trees/acre)
- Medium density (200-300 trees/acre)
- High density (400-800 trees/acre)
- Ultra High density (over 800 trees/acre)

### A. Rootstock characteristics

- Nursery
  - propagation
  - disease problems
  - insect problems
  - growth character
- Field
  - anchorage
  - growth character
  - soil conditions
  - disease problems
  - insect problems
  - spacing

### A. Variety characteristics

- Fruit
  - size
  - color
  - quality
  - storage ability

### B. Structure - growth habit

### C. Ripening

### D. Bearing character

### E. Disease resistance

### F. Spacing
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<td>A. Lecture</td>
<td>A. Students will develop a site plan for model orchard with factors supplied by teacher based on local conditions.</td>
<td>A. Compare student plans with working sites.</td>
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<td>B. Demonstration</td>
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<td>C. Field trips</td>
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<td>D. Supervised student research</td>
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<td>A. Lecture outline</td>
<td>A. Field trips to various density planting sites</td>
<td>A. Written report</td>
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<tr>
<td>A. Lecture - demonstration</td>
<td>A. Students collect variety specimens for class display.</td>
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<tr>
<td>B. Field trip to orchard</td>
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<tr>
<td>C. Compile basic comparison chart (Rootstock vs factors)</td>
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<td>D. Assign students research for class reports.</td>
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<tr>
<td>A. Written report</td>
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<tr>
<td>A. Identification test of main commercial varieties and varieties of local importance.</td>
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<td>B. Oral report</td>
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<td>C. Written quiz on related material</td>
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### OBJECTIVES BY UNIT

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<td>Objective #4</td>
<td>A. Soil requirements of orchards</td>
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<tr>
<td>The student will be able to identify the physical characteristics of orchard soils.</td>
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<tr>
<td>Objective #5</td>
<td>B. Physical characteristics of orchard soils</td>
</tr>
<tr>
<td>The student will be able to recognize physical limitations of orchard soils and be able to make recommendations for improving drainage.</td>
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<tr>
<td>Objective #6</td>
<td>A. Soil Characteristics affecting productivity</td>
</tr>
<tr>
<td>The student will be able to take soil samples, interpret the results of a comprehensive soil analysis and make necessary recommendations for nutrient requirements.</td>
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</tbody>
</table>
### Unit 4 - Basic pollination procedures

| Objective #7                                  | A. Soil Testing |
| The student will be able to develop a pollination schedule. |  
|  
### CONTENT

**A. Soil requirements of orchards**
- Drainage
- Water holding capacity
- Aeration
- Depth favorable to roots

**B. Physical characteristics of orchard soils**
- Texture
- Structure
- Color
- Stoniness
- Tilth
- Slope
- pH
- Mottling

**A. Soil Characteristics affecting productivity**
- Permeability (drainage class)
- Depth favorable to roots
- Moisture holding capacity
- Ease of cultivation

**B. Treatments to improve drainage and productivity**
- Diversion ditches
- Open ditches
- Tile

**A. Soil Testing**
- pH
- Comprehensive soil analysis
  - sample collection
  - handling
  - results
  - recommendations
- Fertilizer application

**A. Principles of pollination**
- Methods
- Flower parts
- Fertilization
- Problems
- cross pollination
- timing
- Aids

**B. Causes of poor fruit set**
<table>
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<th>EVALUATION PROCEDURES</th>
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<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Using &quot;Land Judging Scorecard&quot; have students check characteristics on demonstration sites</td>
<td>A. Test - list physical characteristics.</td>
</tr>
<tr>
<td>B. Outline apple tree soil requirements</td>
<td>A. List physical characteristics of soil (Slide series)</td>
<td>A. Compare student scorecards to standards</td>
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<td></td>
<td>A. Field demonstration</td>
<td>A. Student report on problem situation</td>
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<tr>
<td>A. Lecture</td>
<td>A. Hold soil judging contest</td>
<td>A. Comparison to test site with extra credit possible for individual plans</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>A. Visit orchards</td>
<td>A. Compile pollination schedule for a working orchard with several varieties</td>
</tr>
<tr>
<td>C. SCS soil specialist</td>
<td>A. Gather cost information and maintenance facts</td>
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</tr>
<tr>
<td>D. Field trip - tile installation, ditches</td>
<td>A. Each student collect samples from local farms</td>
<td></td>
</tr>
<tr>
<td>A. Field demonstration by teacher or fertilizer company fieldman</td>
<td>A. Each student interpret results of test and develop a fertilizer program based on his samples</td>
<td></td>
</tr>
<tr>
<td>B. Lecture - demonstration</td>
<td>A. Lecture - demonstration</td>
<td></td>
</tr>
<tr>
<td>A. Field demonstration by teacher or fertilizer company fieldman</td>
<td>A. Bulletin (CU 1146)</td>
<td>A. Visit orchards</td>
</tr>
<tr>
<td>B. Lecture - demonstration</td>
<td>A. Class visit bookkeeper</td>
<td>A. Gather cost information and maintenance facts</td>
</tr>
<tr>
<td>A. Class visit bookkeeper</td>
<td>A. Film - pollination</td>
<td>A. Each student interpret results of test and develop a fertilizer program based on his samples</td>
</tr>
<tr>
<td>D. Film - pollination</td>
<td>A. Check orchard layout observe and/or open working hive</td>
<td>A. Comparison to test site with extra credit possible for individual plans</td>
</tr>
</tbody>
</table>
# THE CULTURAL AND MANAGEMENT PRACTICES OF THE APPLE ORCHARD

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 5 - Pruning and Training**  
Objective #8  
The student will be able to prune young and established apple trees | A. Function of pruning  
- Stimulate growth  
- Shaping  
- Tree strength  
- Harvest ease  
B. Heading  
C. Leader training  
D. Timing  
- Young trees  
- Established trees  
- tender varieties  
- hardy varieties  |
| **Unit 6 - Basic methods of tree propagation**  
Objective #9  
The student will be able to reproduce demonstrated methods of grafting  

Objective #10  
Students will be shown and be able to discuss additional methods of tree propagation | A. Principles of grafting  
B. Types of grafting  
- Bridge  
- Cleft  
- Bud  
- Others  
C. Procedures  

- Types  
  - Inlay  
  - Whip  
  - Others  |
| **Unit 7 - Orchard Pest Control**  
Objective #11  
Students will be able to make pest control recommendations based upon accepted standards and outline a program for the apple orchard | A. Major Disease problems  
B. Major insect problems  
C. Spray or Control scheduling  
D. Animal Pest  

*Complete coverage in modules #91.01020105-02 and # 01.01020105-03 - Controlling apple diseases and controlling apple insects*
## The Cultural and Management Practices of the Apple Orchard

<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture illustration with prepared examples</td>
<td>A. Supervised pruning by students in a working orchard</td>
<td>A. Identification quiz on tools and explanation of use</td>
</tr>
<tr>
<td>B. Demonstration - in class and in field</td>
<td>B. Pruning of school or nearby trees.</td>
<td>B. Individual demonstration on a tree in need of pruning</td>
</tr>
<tr>
<td>C. Ditto worksheet on pruning problems</td>
<td></td>
<td>C. Student will mark wood to be pruned on printed example</td>
</tr>
</tbody>
</table>

(IMS AV 216 Pruning Masters)

A. Lecture - field demonstration of mechanical pruners.
B. Trade or extension programs

<table>
<thead>
<tr>
<th>A. Demonstration</th>
<th>A. Observe operation and take notes: operating principles</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Field trip to commercial nursery</td>
<td>. cost</td>
</tr>
<tr>
<td></td>
<td>. labor</td>
</tr>
<tr>
<td></td>
<td>. time</td>
</tr>
<tr>
<td></td>
<td>. tree damage</td>
</tr>
</tbody>
</table>

A. Notes - practice

A. A. Student managerial report

A. Field trip to commercial nursery

A. Notes - practice

<table>
<thead>
<tr>
<th>A. Lecture</th>
<th>A. Chart basic spray program for a local or the student's orchard-CLASS-DI-SCUSSION-OF PLANS.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Cornell recommendations</td>
<td></td>
</tr>
<tr>
<td>C. Trade recommendations</td>
<td></td>
</tr>
<tr>
<td>D. Pesticide fieldman</td>
<td></td>
</tr>
</tbody>
</table>

A. Class reports

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9
RESOURCE MATERIALS

Books: Modern Fruit Science, Norman Childers Horticultural Publ.
Apple Planting Systems, R.L. Norton Extension Specialist $2.00
Pruning Handbook

Bulletins: Tree Fruit Recommendations N.Y.S. College of Agriculture
Planting and Early Care of the Apple Orchard CU 384
Cultural Practices in the Bearing Orchard CU 1212
Apple Varieties of New York State CU 1174
Pollination and Fruit Development of Tree Fruits CU 1146
Control of Wildlife Damage in Orchards CU 1055
Orchard Soils Land Judging in New York CU 904
Factors Affecting Chemical Thinning of Apples Geneva Search, Vol 1 # 2 Apple Cultivars Geneva
Propagating Fruit Trees
Plant Science Information Bulletins CU
Special Research Reports CU and Geneva
Top-working and Bridge-grafting Fruit Trees CU 832
Establishing and Managing Young Apple Orchards USDA 1897

Masters: AV 216 Pruning CU IMS

Field Trips: NYS Horticultural Society Winter Show Rochester
Kingston Extension Demonstration Plots and Plantings
Trade Field Demonstrations
Nurseries

Films - available from trade sources
Title - CONTROLLING APPLE DISEASES

DESCRIPTION:

This module will enable the student to identify both major and minor diseases of the apple orchard. The student will develop a working knowledge of primary recommendations to control major disease problems at the proper time and be able to safely handle and operate application equipment.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th></th>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Identification of apple diseases</td>
<td>3</td>
</tr>
<tr>
<td>2. Disease life cycles</td>
<td>3</td>
</tr>
<tr>
<td>3. Spray recommendations (fungicides)</td>
<td>2</td>
</tr>
<tr>
<td>4. Spray application-preparation and equipment operation</td>
<td>4</td>
</tr>
<tr>
<td>5. Safety</td>
<td>1/13</td>
</tr>
</tbody>
</table>

Revised March, 1975
OBJECTIVES to be obtained:

The student will be able to:

1. Identify the following major apple diseases at important stages of their development:
   - Apple scab
   - Brown rot
   - Cherry viruses
   - Fireblight
   - Root knot nematode
   - Powdery Mildew

2. Discuss minor apple diseases.

3. Outline the life cycle of the above diseases.

4. Identify field damage of apple diseases and make recommendations to correct or control the problem.

5. Develop a spray program to control problem orchard diseases based upon acceptable recommended materials.

6. Mix spray materials safely, calibrate equipment and apply materials at proper rate.
### Objectives by Unit

#### Unit 1 - Identification of apple diseases

**Objective #1**

The student will be able to identify the following apple diseases at important stages of their development:

- Apple scab cherry viruses
- Brown rot powdery mildew
- Fireblight rootknot nematode

**Objective #2**

The student will be able to discuss minor apple diseases.

#### Unit 2 - Disease life cycles

**Objective #3**

The student will be able to outline the life cycle of all major apple diseases.

#### Unit 3 - Spray recommendations (fungicides)

**Objective #4**

The student will be able to identify field damage of apple diseases and make recommendations to correct or control the problem.

**Objective #5**

The student will be able to develop a spray program to control problem orchard diseases based upon acceptable recommendations.

### Content

#### A. Apple Disease Classification

- Fungus
- Bacterial
- Virus

#### B. Disease Conditions (growth and development)

#### C. Disease Identification

- Damage
  - tree
  - fruit
- Development
  - conditions
  - appearance
- Transmission

#### A. Diseases, Life Cycles

- Dormant
- Active
  - characteristics
  - conditions
  - timing
- Period of effective control

#### A. Materials classification

#### B. Compatibility

#### C. Legal restrictions (pesticide laws)

#### D. Effectiveness of control

---

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### CONTROLLING APPLE DISEASES

<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Take notes</td>
<td>A. Identification quiz</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>B. Visit orchard and conduct</td>
<td>all major or locally</td>
</tr>
<tr>
<td>C. Prepared</td>
<td>C. Collect disease samples</td>
<td>important diseases</td>
</tr>
<tr>
<td>disease mounts</td>
<td>or commercial advertisements</td>
<td>. damage</td>
</tr>
<tr>
<td>or illustrations</td>
<td>of diseases.</td>
<td>. type</td>
</tr>
<tr>
<td></td>
<td>D. Plot life cycle chart for</td>
<td>. transmission</td>
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<tr>
<td></td>
<td>each major disease</td>
<td></td>
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</tbody>
</table>

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<tr>
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<th></th>
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</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Complete disease ditto</td>
<td>A. Grade completed</td>
</tr>
<tr>
<td>B. Prepare ditto handout for each disease</td>
<td>B. Student reports on each disease</td>
<td>ditto and notes</td>
</tr>
<tr>
<td>C. Orchard observation</td>
<td>C. Collect five field samples</td>
<td>B. Field samples</td>
</tr>
<tr>
<td>D. Slides</td>
<td>D. Inventory a diseased orchard</td>
<td>C. Quiz</td>
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</tbody>
</table>

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<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Compare material ingredients</td>
<td>A. Grade schedule</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>using Cornell Recommendations</td>
<td>and selection of</td>
</tr>
<tr>
<td>C. Resource person</td>
<td>and trade guides develop a</td>
<td>materials</td>
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<tr>
<td></td>
<td>spray program using accept-</td>
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<tr>
<td></td>
<td>able materials for a test</td>
<td></td>
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<tr>
<td></td>
<td>orchard.</td>
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</tbody>
</table>

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5
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 4 - Spray application - preparation and equipment operation</td>
<td>A. Pesticide Safety</td>
</tr>
<tr>
<td>Objective #6</td>
<td>. Storage</td>
</tr>
<tr>
<td></td>
<td>. Handling</td>
</tr>
<tr>
<td></td>
<td>. Mixing</td>
</tr>
<tr>
<td></td>
<td>. First Aid</td>
</tr>
<tr>
<td></td>
<td>B. Pesticide mixing procedure</td>
</tr>
<tr>
<td></td>
<td>C. Calibration of spray application equipment</td>
</tr>
<tr>
<td></td>
<td>D. Operation of spray application equipment</td>
</tr>
<tr>
<td></td>
<td>. Types</td>
</tr>
<tr>
<td></td>
<td>. Principles of operation</td>
</tr>
<tr>
<td></td>
<td>. Service and maintenance</td>
</tr>
<tr>
<td></td>
<td>. Operation</td>
</tr>
</tbody>
</table>

The student will be able to mix spray materials safely, calibrate equipment and apply materials at the proper rate.
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Pesticide safety program</td>
<td>A. Outline safety procedures and list hazards</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>B. Present safety demonstration</td>
<td>B. Each student demonstrate pesticide mixing</td>
</tr>
<tr>
<td>C. Resource Person</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Film</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Lecture - Demonstration</td>
<td>A. Students measure and mix sample materials.</td>
<td>A. Observation of student safety habits and procedure</td>
</tr>
<tr>
<td>B. Lecture - Demonstration</td>
<td>B. Calibrate main types</td>
<td>B. Check accuracy</td>
</tr>
<tr>
<td>C. Lecture - Demonstration</td>
<td>C. Prepare applicator for operation performing all service and maintenance operations.</td>
<td>C. Compare to check list</td>
</tr>
<tr>
<td>D. Field trip</td>
<td>D. Operate equipment under field conditions</td>
<td>D. Observe operation</td>
</tr>
<tr>
<td>. Equipment dealer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>. Orchard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>. Trade shows</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Operation and Service checklist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Film</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A. Observation of student safety habits and procedure
B. Check accuracy
C. Compare to check list
D. Observe operation
E. Quiz
Title - Controlling Apple Diseases

RESOURCE MATERIALS

Books:
- Modern Fruit Science, Norman Childers Horticultural Publ.
- Approved Practices in Fruit Production, Scheer and Juergenson Interstate Publ.

Bulletins:
- Tree Fruit Recommendations N.Y.S. College of Agriculture
- Cultural Practices in the Bearing Apple Orchard CU 1212
- Planting Practices for Control of Cherry Yellows
- Virus Complex CU 1066
- Combating Replant Problems in Orchards CU 1169
- Five-Year Study of Fire Blight CU 963
- Insects and Diseases of Stone Fruit Trees CU 1113
- Aircraft for Orchard Disease Control Geneva 8
- Petroleum Oils for Control of Orchard Pest USDA 814
- Besticides and You Chemical-Pesticides Publ 6
- Pesticide register G.L. Mack (Geneva)
- Power Sprayers and Dusters USDA 2223
- Establishing and Managing Young Apple Orchards USDA 1897

Field Trips:
- NYS Horticultural Society Winter Show
- Demonstration Programs
- Local Orchards

Films available from trade sources
MODULE OF INSTRUCTION

Title - CONTROLLING APPLE INSECTS

DESCRIPTION:

This module will enable the student to identify the primary insect pest of apples. In addition, life cycles of these insects will be studied and the damage caused by them. The student will develop a working knowledge of spray materials and recommendations with skills necessary to operate equipment and apply insecticides. Students will be able to identify field injury resulting from insects and be exposed to new techniques in insect-control.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocations</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identification of apple insects and their damage</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>2. Insect life cycles</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>3. Spray recommendations</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>4. Spray application - preparation and equipment operation</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>5. Safety</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>6. Insect trap techniques and monitoring</td>
<td>1 1/2</td>
<td>1 1/2</td>
</tr>
</tbody>
</table>

Revised June, 1974
MODULE OF INSTRUCTION

Title - CONTROLLING APPLE INSECTS

OBJECTIVES to be obtained:

The student will be able to:

1. Identify the following major insect pests of the apple orchard at important stages of their life cycles:
   - Apple maggot
   - Mites - E.R.M. & 2 spotted
   - Red-banded leaf roller
   - Coddling moth
   - Aphids - green and rosy
   - Oriental fruit moth
   - Plum curculio
   - Peach tree borer

2. Discuss minor apple insect pests and effective measures of control.

3. Recognize field damage caused by problem insects in the apple orchard.

4. Outline the life cycles of the above insects and be able to specify optimum periods for effective control.

5. Categorize spray materials and compile or organize a program to control orchard insect pests based on accepted recommendations.

6. Mix spray materials safely, calibrate application equipment and apply materials at proper rate.

7. Discuss biological control of insect pests and methods of monitoring.
CONTROLLING APPLE INSECTS

OBJECTIVES BY UNIT

Unit 1 - Identification of apple insects
Objective #1
The student will be able to identify the following major insect pest of the apple orchard at important stages of their life cycle:
- Apple maggot
- Mites - E. R. M. & 2 spotted
- Red banded leaf roller
- Coddling moth
- Aphid - green and rosy
- Oriental fruit moth
- Plum curculio
- Peach tree borer

Objective #2
The student will be able to identify the following major insect pest of the apple orchard at important stages of their life cycle:

Objective #3
The student will be able to discuss minor or other insect pest of local importance and effective measures of control.

Objective #4
The student will be able to recognize field damage caused by problem insects in the apple orchard.

Unit 2 - Insect life cycles
Objective #4
The student will be able to outline the life cycle of the above insects and be able to specify optimum periods for effective control.

CONTENT

A. Basic Entomology (General Introduction)
B. Insect Characteristics
   - Head
   - Thorax (legs & wings)
   - Abdomen
C. Types of Orchard Insect Pests
   - Chewing
   - Sucking
   - Lapping
D. Insect Development (Metamorphosis)
   - Egg
   - Larvae
   - Pupa
   - Adult

A. Types of field damage
   - Trees
   - Fruit
B. Characteristics of Damage
C. Economic Effect

A. Life Cycles
B. Feeding Habit
C. Field Damage
### Teaching Methods

| A. Lecture - using chalkboard and overhead |
| B. Lead class discussion to select major pest |
| C. Prepared mounts or trade illustrations on display |
| D. Movie |
| E. Demonstration |
| F. Field trip |

### Student Application Activities

| A. Complete picture of typical insect identifying parts |
| B. Each collect five insect specimens |
| C. Collect five examples of insect field damage |

### Evaluation Procedures

| A. Identification quiz |
| B.movie |
| C. Demonstration |

| A. Inventory orchard for insect damage |
| B. Compare fruit damage and discuss effect on price |
| C. Hold insect and insect damage contest |

| A. Chart life cycle of all major insect pest indicating optimum time of control |

<p>| A. Collect notes |
| B. Quiz |</p>
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 3 - Spray recommendations**  
Objective #5  
The student will be able to categorize spray material and to compile or organize a program to control orchard insect pest based on accepted recommendations | **A. Types of Spray Materials**  
- Adjuvants  
  - wetting agents  
  - spreaders  
  - stickers  
  - penetrants  
  - emulsifiers  
  - dispersants  
- Insecticides  
  - petroleum oils (dormant)  
  - lead arsenate (inorganic)  
  - phosphate (contact or internal)  
- Acaricides (mites)  
- Organic Compounds |
| **Unit 4 - Spray application - preparation and equipment operation**  
Objective #6  
The student will be able to mix spray materials safely, calibrate application equipment and apply materials at proper rate. | **B. Physical compatibility**  
**C. Application period**  
**A. Pesticide Safety**  
- Storage  
- Handling  
- Mixing  
- First Aid  
**B. Pesticide mixing procedure**  
**C. Calibration of spray application equipment**  
**D. Operation of pesticide application equipment**  
- Types  
- Principles of operation  
- Service and maintenance  
- Operation |
| **Unit 6 - Insect trap techniques and monitoring**  
Objective #7  
The student will be able to discuss biological control of insect pest and methods of monitoring | **A. Biological controls**  
- Predators  
- Set pheromone trap  
**B. Insect monitoring** |
## Teaching Methods

<table>
<thead>
<tr>
<th>A. Lecture</th>
<th>A. Develop worksheet comparing materials.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Demonstration</td>
<td>B. Each student report on an assigned material</td>
</tr>
<tr>
<td>C. Movie</td>
<td>C. Obtain trade materials for comparison and evaluation</td>
</tr>
<tr>
<td>D. Worksheet</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Demonstration</th>
<th>A. Develop program using local conditions with compatible materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Lecture-Demonstration</td>
<td>B. Mix simulated materials under supervision</td>
</tr>
<tr>
<td>C. Lecture</td>
<td>C. Pesticide safety contest or program</td>
</tr>
<tr>
<td>D. Demonstration</td>
<td>D. Demonstration</td>
</tr>
<tr>
<td>E. Resource person</td>
<td>E. Calibrate equipment under test and field conditions</td>
</tr>
<tr>
<td>F. Field trip:</td>
<td>F. Compare types of equipment, operation and service</td>
</tr>
<tr>
<td>. Dealer</td>
<td></td>
</tr>
<tr>
<td>. Orchard</td>
<td></td>
</tr>
<tr>
<td>. Equipment show or demonstration</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Resource person</th>
<th>G. Field operation of equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td>. Spray representative</td>
<td></td>
</tr>
<tr>
<td>B. Lecture</td>
<td></td>
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<tr>
<td>C. Demonstration</td>
<td></td>
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<tr>
<td>D. Demonstration</td>
<td></td>
</tr>
<tr>
<td>E. Field Trip:</td>
<td></td>
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<td>. Dealer</td>
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<tr>
<td>. Orchard</td>
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<tr>
<td>. Equipment show or demonstration</td>
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## Student Application Activities

<table>
<thead>
<tr>
<th>A. Lecture</th>
<th>A. Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Organized class discussion</td>
<td>B. Prepare written report</td>
</tr>
<tr>
<td>C. Demonstration</td>
<td>C. Visit location or place monitoring or trap device for class observation.</td>
</tr>
<tr>
<td>D. Resource person</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Worksheets</th>
<th>A. Quiz</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Reports</td>
<td>B. Reports</td>
</tr>
<tr>
<td>C. Quiz</td>
<td></td>
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</tbody>
</table>

## Evaluation Procedures

<table>
<thead>
<tr>
<th>A. Student program</th>
<th>A. Student program using local conditions with compatible materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Quiz</td>
<td>B. Mix simulated materials under supervision</td>
</tr>
</tbody>
</table>
| C. Grade student demonstra
tion | C. Pesticide safety contest or program                               |
| Grade student performance | D. Demonstration                                                      |
| Grade student performance | E. Calibrate equipment under test and field conditions                |
| Grade student performance | F. Compare types of equipment, operation and service                  |
| Grade student performance | G. Field operation of equipment                                        |
|                        |                                                                      |

<table>
<thead>
<tr>
<th>A. Quiz</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Reports</td>
<td></td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - Controlling Apple Insects

Code - 01.01020105-03

RESOURCE MATERIALS

Books:
- Modern Fruit Science, Norman Childers, Horticultural Publ.
- Approved Practices in Fruit Production, Scheer & Juergensen
- Insects Identification Manual, California State Polytechnic
- Insects The Yearbook of Agriculture 1952

Bulletins:
- Cultural Practices in the Bearing Orchard, CU 1212
- Insects and Diseases of Stone Fruit Trees, CU 1113
- Petroleum Oils for the Control of Orchard Pest, Geneva 814
- Apple Maggot Control, Research Circular 5
- Apple Maggot Fly Emergence, Geneva 789
- Red-banded Leaf Roller and Its Control, Geneva 755
- Pesticides and You, Chemicals-Pesticides, 6
- Pesticide Register, Geneva
- Power Sprayers and Dusters, USDA 2223
- Tree Fruit Recommendations, N.Y.S. College of Agriculture

A great deal of trade material is available from manufacturer.

Film: First aid - poisons
Trade Films
Title - HARVEST, MARKETING, AND STORAGE OF THE APPLE CROP

Code - 01.01020105-04

DESCRIPTION:

New York State apples are available during most of the year because of effective harvesting, storing, and marketing methods. This module is designed to consider both the technical and skill aspects of these factors. The student will examine the industry and production cost factors.

The student will be able to determine apple maturity and evaluate methods of harvest. Methods of storage will be compared and grading standards discussed with consideration given to marketing channels. The student will be able to identify the primary problems of the apple industry and pose solutions.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
<td>1. Understanding the Apple Industry</td>
</tr>
<tr>
<td>2. Apple Harvest</td>
</tr>
<tr>
<td>3. Apple Storage</td>
</tr>
<tr>
<td>4. Apple Marketing and Grading</td>
</tr>
<tr>
<td>5. Identification of Industry Problems and Consideration of Solutions</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Revised March 1975
OBJECTIVES to be obtained: The student will be able to:

1. Collect economic data materials: prices, production cost, etc., and interpret the factors which have resulted in the local, state, and national apple markets.

2. Outline both the process and fresh fruit marketing channels available to the producer.

3. Harvest fresh market and process apples and demonstrate an understanding of the principles of mechanical apple harvest.

4. Compare methods of apple storage and make a selection based on local business factors.

5. Investigate institutions which affect the marketing of the apple crop and evaluate the role played by each.


7. Analyze the problems facing the apple industry and pose researched solutions.
# Title
Harvest, Marketing and Storage of the Apple Crop

## Objectives by Unit

### Unit 1 - Understanding the Apple Industry

**Objective 1**
Collect economic data materials: prices, production cost, etc., and to interpret the factors which have resulted in the local, state, and national apple market.

**Objective 2**
Outline both the process and fresh fruit marketing channels available to the producer.

### Unit 2 - Apple Harvest

**Objective 3**
Harvest fresh market and process apples and demonstrate an understanding of the principles of mechanical apple harvest.

## Content

### A. Apple production regions

### B. Product characteristics

### C. Production and consumption data
- Local
- State
- National

### D. Basic economics
- A. The apple market
  - Fresh
    - Direct
    - Wholesale
  - Process
    - Contract
    - Open market
- B. Cooperative
- C. Agencies
  - Commission houses
  - Brokers
  - Jobbers

### A. Time of apple harvest
- Flesh firmness
- Ground color
- Ease of separation
- Lays in full bloom
- Calendar date
- Sugar content

### B. Methods of apple harvest
- Hand
  - Preparation
  - Equipment
  - Containers
  - Labor
  - Procedure
  - Mechanical

### C. Crop handling

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Harvest, Marketing and Storage of the Apple Crop

<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture outline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Resource person</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Field trip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Survey local fruit industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Prepare exhibit to show characteristics of the apple and the apple industry</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Oral or written test on prices</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| A. Lecture outline |
| B. Field trips |
| C. Resource people |
| D. Marketing representative |
| A. Outline local marketing channels |
| B. Develop a plan to market apples given a local situation |
| C. Class reports |
| A. Oral or written test on fresh markets |
| B. Teacher evaluation of plan and report evaluation |

| A. Lecture outline |
| B. Demonstration |
| C. Field trips |
| D. Resource person |
| A. Students check orchard using various methods of determining ripeness |
| B. Pickup drops for fund raising activity |
| C. Harvest apples in orchard |
| A. Check each student's harvest - sample |
| B. Oral or written test on the principles of mechanical harvest |

| E. Field trial or demonstration |
| F. Panel discussion: hand vs. mechanical harvest |
| G. Demonstration |
| D. Review trade material |
| C. Class presentation |
| E. Compare damage with various handling procedures |

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# Harvest, Marketing and Storage of the Apple Crop

## Objectives by Unit

### Unit 3 - Apple Storage

**Objective 4**

Compare methods of apple storage and make a selection based on local business factors.

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Types of apple storage</td>
</tr>
<tr>
<td>- Common</td>
</tr>
<tr>
<td>- Refrigerated</td>
</tr>
<tr>
<td>- Controlled atmosphere</td>
</tr>
<tr>
<td>- Freezer</td>
</tr>
<tr>
<td>B. Factors affecting storage life</td>
</tr>
<tr>
<td>- Climate</td>
</tr>
<tr>
<td>- Orchard management</td>
</tr>
<tr>
<td>- Variety</td>
</tr>
<tr>
<td>- Size</td>
</tr>
<tr>
<td>- Maturity</td>
</tr>
<tr>
<td>- Handling</td>
</tr>
<tr>
<td>- Temperature</td>
</tr>
<tr>
<td>- Market</td>
</tr>
<tr>
<td>C. Storage problems</td>
</tr>
<tr>
<td>- Temperature</td>
</tr>
<tr>
<td>- Disease</td>
</tr>
<tr>
<td>- Rodent</td>
</tr>
</tbody>
</table>

### Unit A - Apple Marketing and Grading

**Objective 5**

Investigate institutions which affect the marketing of the apple crop and be able to evaluate the role played by each.

**Objective 6**

Restate apple grading standards and grade a standard sample to USDA specifications.

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Market outlets</td>
</tr>
<tr>
<td>- Individuals - open market</td>
</tr>
<tr>
<td>- Contracts</td>
</tr>
<tr>
<td>- Cooperative</td>
</tr>
<tr>
<td>B. Marketing orders</td>
</tr>
<tr>
<td>C. Market controls</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Apple grade standards</td>
</tr>
<tr>
<td>B. Mechanical grading</td>
</tr>
<tr>
<td>C. Hand grading</td>
</tr>
</tbody>
</table>

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464
<table>
<thead>
<tr>
<th><strong>TEACHING METHODS</strong></th>
<th><strong>STUDENT APPLICATION ACTIVITIES</strong></th>
<th><strong>EVALUATION PROCEDURES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture outline</td>
<td>A. Fill in comparison chart</td>
<td>A. Oral quiz</td>
</tr>
<tr>
<td>B. Field trips</td>
<td>B. Visit at least two types of storage</td>
<td>B. Collect charts</td>
</tr>
<tr>
<td>C. Ditto handout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Outline factors affecting storage life—allow students to research areas.</td>
<td>C. Compile factor — affect chart</td>
<td></td>
</tr>
<tr>
<td>E. Supervised study</td>
<td>D. Oral report to class</td>
<td></td>
</tr>
<tr>
<td>F. Resource person</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Lecture outline</td>
<td>A. Review mounts and specimen samples</td>
<td>A. Identification quiz</td>
</tr>
<tr>
<td>B. Resource person</td>
<td></td>
<td>B. Report grade</td>
</tr>
<tr>
<td>C. Field trip</td>
<td>A. Have students market an apple crop as a managerial exercise</td>
<td></td>
</tr>
<tr>
<td>D. Prepared mounts and specimens</td>
<td>C. Have students record daily apple market prices</td>
<td></td>
</tr>
<tr>
<td>E. Lecture outline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Field trip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Resource person</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Students will grade field samples of apple-crop using grade standards and sizing rings</td>
<td>A. Quiz on grade standards each grade one bushel</td>
</tr>
<tr>
<td></td>
<td>B. Students will observe mechanical grader in operation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A. Oral quiz
B. Collect charts
C. Grade report

A. Identification quiz
B. Report grade

A. Quiz on grade standards each grade one bushel
### OBJECTIVES BY UNIT

**Unit 5 - IDENTIFICATION OF INDUSTRY PROBLEMS AND CONSIDERATION OF SOLUTIONS**

**Objective 7**

Analyze the problems facing the apple industry and be able to pose researched solutions

### CONTENT

A. Primary apple industry problems
   - Efficiency
   - Production
   - Labor
   - Market
   - Education
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture outline of managerial decision</td>
<td>A. Develop managerial plan</td>
<td>A. Each student will present the topic individually or as part of a group</td>
</tr>
<tr>
<td>B. Resource person and interviews</td>
<td>B. Present panel discussion to social studies class or local service club</td>
<td>Grade managerial plan</td>
</tr>
<tr>
<td></td>
<td>C. Have students examine new market channels</td>
<td></td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - Harvest, Marketing and Storage of the Apple Crop

Code - 01.01020105-04

RESOURCE MATERIALS

Books:
Modern Fruit Science, Norman Childers Horticultural Publ.
Approved Practices in Fruit Production Sheer and
Juergensen Interstate
Apple Planting Systems R.L. Norton Extension Specialist

Bulletins:
Tree Fruit Recommendations N.Y.S. College of Agriculture
Cultural Practices of the Bearing Orchard CU 1212
Apple Varieties of New York State CU 1174
The Storage of Apples CU 440
Controlled Atmosphere Storage of Apples CU 759
Harvesting, Handling and Packing Apples CU 750
Apple Grade Standards USDA
Directions for Judging Apples Cornell Dept. of Pomology
**GRADES**

**U.S. Extra Fancy** consists of apples of one variety which are mature (1) but not overripe (2), carefully hand-picked (3), clean (4), well formed (5), free from decay, internal browning, internal breakdown, scald, scab, bitter pit, Jonathan spot, freezing injury, broken skins, and bruises (except those that are slight and incident to proper handling and packing), and visible water core. The apples shall also be free from injury (6) caused by russetting (6a), sunburn or spray burn (6b), limb rubs (6c), hail (6d), drought spots (6d), scars (6d), stem or calyx cracks (6e), other diseases (6f), insects (6g), or mechanical or other means (6). Each apple of this grade shall have the amount of color specified hereinafter for the variety. (see Color Requirements, Tolerances and Condition after Storage and/or Transit.)

**U.S. Fancy** consists of apples of one variety which are mature (1) but not overripe (2), carefully hand-picked (3), clean (4), fairly well formed (7), free from decay, internal browning, internal breakdown, scab, bitter pit, Jonathan spot, scald, freezing injury, broken skins, and bruises (except those that are slight and incident to proper handling and packing), and visible water core. The apples shall also be free from damage (8) caused by russetting (8a), sunburn or spray burn (8b), limb rubs (8c), hail (8d), drought spots (8d), scars (8d), stem or calyx cracks (8e), other diseases (8f), insects (8g), or mechanical or other means (8). Each apple of this grade shall have the amount of color specified hereinafter for the variety. (See Color Requirements, Tolerances and Condition after Storage or Transit.)

**U.S. No. 1** The requirements for this grade are the same as U.S. Fancy except for the color and russetting. In this grade less color is required for all varieties except yellow and green varieties, for which the requirements for both grades are the same. Apples of this grade shall be free from excessive damage caused by russetting which means that they shall meet the russetting requirements for U.S. Fancy as defined under the definitions of "damage by russetting" (8a) provided, that, the aggregate area of an apple which may be covered by net-like russetting shall not exceed 25 per cent, and further provided, that the aggregate area of an apple which may be covered by smooth solid russetting shall not exceed 10 per cent. (See Color Requirements, Tolerances and Condition after Storage or Transit.)

**U.S. No. 1 Cookers** consists of apples of one variety which meet the requirements of U.S. No. 1 grade except as to color. This grade is provided for apples which are mature but which may not have sufficient color or meet the specifications of U.S. No. 1 (see Tolerances and Condition after Storage or Transit.)

1. Numbers and letters in parentheses following grade terms indicate where such terms are defined under Definitions.

**U.S. Utility** consists of apples of one variety which are mature (1) but not overripe (2), carefully hand-picked (3) not seriously deformed (9), free from decay, internal browning, internal breakdown, scald and freezing injury. The apples shall also be free from serious damage (10) caused by dirt or other foreign matter, broken skins, bruises, russetting (10a), sunburn (10b), spray burn (10b), limb rubs (10c), hail (10d), drought spots (10d), scars (10d), stem or calyx cracks (10e), visible water core (10f), other diseases (10g), insects (10h), or mechanical or other means (10). (See Tolerances and Condition after Storage or Transit.)

**U.S. Hail Grade** consists of apples which meet the requirements of U.S. No. 1 grade except that hail marks where the skin has not been broken and well healed hail marks where the skin has been broken shall be permitted, provided the apples are fairly well formed. (see Color Requirements, Tolerances and Condition after Storage or Transit.)
1. **Score Card:** The type of score card used, the points considered and their relative importance varies in different exhibits or contests. The score card considered here is used by the New York State Horticultural Society and considers the following points and values.

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>15</td>
</tr>
<tr>
<td>Size</td>
<td>15</td>
</tr>
<tr>
<td>Color</td>
<td>25</td>
</tr>
<tr>
<td>Condition or Maturity</td>
<td>15</td>
</tr>
<tr>
<td>Freedom from Blemish</td>
<td>30/100</td>
</tr>
</tbody>
</table>

2. **Interpretation of terms:**

   (1) **Form:** The shape and conformation of apples on any one plate should be typical for the variety, the region of growth being considered somewhat. All specimens on a plate should be uniform in shape. When competition is close, a careful comparison of the minute characteristics of the basin, cavity and stem are made when considering uniformity.

   (2) **Size:** The specimens on any one plate should be uniform in size and of the size that is most acceptable on the market for the variety. A plate should be scored down if the specimens are either under or over the accepted commercial size.

   (3) **Color:** All specimens on the plate should be uniformly colored in the way that is considered ideal for the variety in the district grown. In judging color consider: (a) the attractiveness of the ground color, (b) the brightness and attractiveness of the over-color, (c) the amount of over-color. In a yellow or green apple the yellow or green color should be clear and even all over, not dull or muddy. In varieties that are typically blushed (e.g., Maiden Blush) the specimens should show a distinct tinge of red on the cheek exposed to the sun. With apples like the Rhode Island Greening that are only sometimes blushed the apples on a given plate should be either uniformly blushed or uniformly green. In western New York preference is given to green Rhode Island Greenings over the blushed type provided the plates in question are equally good otherwise.

   With apples typically with a red over-color, an intense color for the variety is desirable. In general, the more color the better the plate, provided the color is typical. Apples may be polished, but in no case should polished specimens be given the preference.

   Under this heading is included the somewhat indefinite characteristic known as "finish." This refers to the brightness and clearness of the over-color and ground color and the smoothness of the skin. Finish is particularly important in green varieties like Rhode Island Greening. The finish may be bright and reflective or "muddy" though the actual shade of green may be the same.
(4) **Condition or Maturity:** This refers to the degree of ripeness. An apple to be in excellent condition should be mature, but firm for the variety. It should be free from withering that comes when apples are picked too green or have not been stored properly. The fruit should not be overripe so as to be mealy or show physiological breakdown.

(5) **Freedom from Blemish:** Specimens should be free from blemishes of all sorts. The judges should look particularly for (a) marks of fungus or physiological disease, including worm and watercore; (b) injury from insects of all kinds, (c) mechanical injury, including loss of stem. Unmistakable evidence of codling moth injury or San Jose Scale may disqualify a plate. Other blemishes are considered important in about the following order: side worms, scab, other fungous blemishes, stippin, curculio or red bug, skin punctures, bruises, stem broken or out, russet (not typical for variety) and limb rub. The extent of scab spots should be considered. Minute spots are not as serious as some other blemishes, whereas spots which would throw the apple out of fancy grade should disqualify the plate.

Attention is called to the fact that on this score card **uniformity** is not considered as a separate heading but that it is scored under each of the headings, form, size, and color. Some score cards give uniformity as a separate heading, but this is not considered advisable, because such a practice usually results in a double cut for uniformity.

3. **Other Information:** Five specimens constitute a plate for judging, and either four or six specimens disqualify a plate in a contest.

**Caution:** Avoid pressing the specimens with the thumb and finger so as not to bruise the fruit. The degree of firmness can be determined by gentle pressure with the inside of the whole hand.

**Defects,** apparent or otherwise should not be probed with finger nail or other hard object. This disfigures the fruit and makes the contest unfair for those who judge the fruit later.

Special care should be used to replace all specimens on the right plate.

Be prepared if necessary to defend your judgment in the placing of the plates.

If the variety is incorrectly named the plate is disqualified and if possible the correct name indicated on the plate card. If a synonym is used the plate is judged and the accepted name indicated.
# Score Card for Plates of Apples

**Student's Name**

**Variety**

### Plate I

<table>
<thead>
<tr>
<th>Perfect Score</th>
<th>Score</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Freedom from Blemish</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

### Plate II

<table>
<thead>
<tr>
<th>Perfect Score</th>
<th>Score</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freedom from Blemish</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Score**

### Plate III

<table>
<thead>
<tr>
<th>Perfect Score</th>
<th>Score</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Freedom from Blemish</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

**Placing:** 1st

### Plate IV

<table>
<thead>
<tr>
<th>Perfect Score</th>
<th>Score</th>
<th>Reasons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Freedom from Blemish</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
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</tr>
</tbody>
</table>

**Placing:** 2nd

**Placing:** 3rd

**Placing:** 4th

---

**Score:** 472
# Methods of Storing Apples

<table>
<thead>
<tr>
<th>Description</th>
<th>Controlled Atmosphere</th>
<th>Refrigerated</th>
<th>Common or Air Cooled</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discription</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advantages</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disadvantages</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Principles of Operation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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474
MODULE OF INSTRUCTION

Title: Producing Vegetable Crops for Processing

Code: 01.01020107-01

DESCRIPTION:

The costs and returns of producing vegetable crops for processing will be reviewed by students enrolled in this module as they develop skills in the selection of vegetable varieties in demand by vegetable processors. Cultural practices for the production of high quality vegetables will be discussed.

Processor contracts, quality of vegetables to be harvested, and types of equipment needed to economically produce processing vegetables are areas in which students will work.

Special services such as grading and packing the raw vegetable products will be performed by students.

<table>
<thead>
<tr>
<th>Divisions or Units of Content</th>
<th>Time Allocation</th>
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<tbody>
<tr>
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<td>Class</td>
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<tr>
<td>1. The Costs of and Returns on Vegetable Crops Raised for Processing</td>
<td>3</td>
</tr>
<tr>
<td>2. Negotiating Contracts with Vegetable Processors</td>
<td>2</td>
</tr>
<tr>
<td>3. Cultural Practices for Vegetable Production</td>
<td>4</td>
</tr>
<tr>
<td>4. Harvesting and Packing Techniques for Processing Vegetables</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title: Producing Vegetable Crops for Processing

Code: 01.01020107-01

OBJECTIVES to be obtained:

The student will be able to:

1. Determine the feasibility of establishing a vegetable enterprise for a processing market.

2. Select 8 vegetable crops which can be grown for processing in a specific region. Determine the factors to consider for producing each crop selected.

3. Determine the costs involved in producing a specific vegetable crop.

4. Research a list of prices received by producers over the past 5 years for each crop listed in objective 2. Present the information in graph form.

5. Determine which of the vegetable crops selected would be the most profitable in a given region. Rank each in order of the amount of highest economical returns.

6. Determine 4 factors used in negotiating a growing contract with processors.

7. List 10 items which need to be considered in developing a bonified written contract.

8. Develop a growing and marketing contract for a specific vegetable crop.

9. Demonstrate acceptable techniques for the operation of equipment needed to fit soil, plant and produce vegetable crops.

10. Identify 2 acceptable means of weed control for each vegetable listed in objective 2.

11. List 2 insecticides which are permissible for use on each crop listed in objective 2.

12. Identify 6 pests which can attack each vegetable listed in objective 2.

13. Determine if irrigation will be needed for the production of crops selected in objective 2.

14. List market grades used to evaluate each crop listed in objective 2.

15. Compare the cost of mechanical harvesting and hand labor for each crop listed in objective 2.
Title - Producing Vegetable Crops for Processing  

OBJECTIVES to be obtained: Cont.

16. Demonstrate the ability to operate in a live situation at least one mechanical harvester for a specific vegetable crop produced in your region.

17. Determine the optimum time to harvest vegetable crops that will insure a high quality package after the vegetable is processed.

18. Determine the techniques used by the farmer to handle vegetable crops in preparing for and transporting them to the processor.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1 - The costs of and returns on vegetable crops raised for processing</td>
<td>A. Factors affecting production</td>
</tr>
<tr>
<td></td>
<td>. Soil</td>
</tr>
<tr>
<td></td>
<td>. type</td>
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<tr>
<td></td>
<td>. drainage</td>
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<td></td>
<td>. fertility</td>
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<tr>
<td></td>
<td>. Climate</td>
</tr>
<tr>
<td></td>
<td>. Topography</td>
</tr>
<tr>
<td>Objective 1</td>
<td>B. Labor</td>
</tr>
<tr>
<td>Determine the feasibility of establishing a vegetable enterprise for a processing</td>
<td>. Availability</td>
</tr>
<tr>
<td>market.</td>
<td>. Cost</td>
</tr>
<tr>
<td></td>
<td>C. Markets</td>
</tr>
<tr>
<td></td>
<td>. Locations</td>
</tr>
<tr>
<td></td>
<td>. distance</td>
</tr>
<tr>
<td>Objective 2</td>
<td>A. Equipment</td>
</tr>
<tr>
<td>Select 8 vegetable crops which can be grown for processing in a specific region.</td>
<td>. Soil preparation</td>
</tr>
<tr>
<td>Determine the factors to consider for producing each crop selected.</td>
<td>. Planting</td>
</tr>
<tr>
<td></td>
<td>. Harvesting</td>
</tr>
<tr>
<td></td>
<td>B. Fertilizers</td>
</tr>
<tr>
<td></td>
<td>. Amounts needed (from test)</td>
</tr>
<tr>
<td></td>
<td>. Cost</td>
</tr>
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<td></td>
<td>. Methods of applications</td>
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<td></td>
<td>C. Herbicides</td>
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<td></td>
<td>. Cost</td>
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<td>. Applicability</td>
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<td>D. Pesticides</td>
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<td>. Costs</td>
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<td>. Applicability</td>
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<td>E. Labor</td>
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<td>. Availability</td>
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<td>. Adaptability to the crop</td>
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<td>. Cost</td>
</tr>
<tr>
<td></td>
<td>F. Custom work</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Lecture/discussion</td>
<td>A. Take notes on lecture and class discussions.</td>
</tr>
<tr>
<td>B. Supervised study on land use capability maps</td>
<td>B. Secure land use capability map of the geographic area of particular interest.</td>
</tr>
<tr>
<td>C. Field trip to land laborato to farm and commercial growers</td>
<td>C. Test soil for fertility and pH.</td>
</tr>
<tr>
<td>D. Invite speakers from Soil Conservation Service, Cooperative Extension, Personnel from processing plants.</td>
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<tr>
<td>E. Demonstrate how to secure soil samples, test samples, and determine fertilizer requirements.</td>
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<tr>
<td></td>
<td>A. Class discussion of the factors involved.</td>
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<tr>
<td></td>
<td>B. Supervised study of crops which are adaptable to New York State, and to the geographical locations selected.</td>
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<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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<td>------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Objective 3</td>
<td>A. Equipment</td>
</tr>
<tr>
<td></td>
<td>• Depreciation</td>
</tr>
<tr>
<td></td>
<td>• Operation</td>
</tr>
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<td>B. Fertilizer</td>
</tr>
<tr>
<td></td>
<td>• Season purchased</td>
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<tr>
<td></td>
<td>• In season cost - high</td>
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<td>• Off season cost - lower</td>
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<td>C. Herbicides</td>
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<td>• Cost of product</td>
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<td>• Cost of application</td>
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<td></td>
<td>D. Pesticides</td>
</tr>
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<td></td>
<td>• Cost of product</td>
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<td>• Cost of application</td>
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<td>E. Labor</td>
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<td>• Wages</td>
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<td>• Insurance</td>
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<td>• Social security</td>
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<td>• Housing</td>
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<td>• Union activities</td>
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<td>F. Custom work</td>
</tr>
<tr>
<td>Objective 4</td>
<td>A. Market Prices</td>
</tr>
<tr>
<td></td>
<td>• Income for vegetable crops</td>
</tr>
<tr>
<td></td>
<td>• Prices received for each type of crop over the past 5 years</td>
</tr>
<tr>
<td>Objective 5</td>
<td>A. Cost of producing</td>
</tr>
<tr>
<td></td>
<td>• Machinery</td>
</tr>
<tr>
<td></td>
<td>• Labor</td>
</tr>
<tr>
<td></td>
<td>• Seed</td>
</tr>
<tr>
<td></td>
<td>• Fertilizer</td>
</tr>
<tr>
<td></td>
<td>• Herbicides</td>
</tr>
<tr>
<td></td>
<td>• Insecticides</td>
</tr>
<tr>
<td></td>
<td>• Transportation</td>
</tr>
<tr>
<td></td>
<td>B. Income Factors</td>
</tr>
<tr>
<td></td>
<td>• Prices received</td>
</tr>
<tr>
<td></td>
<td>• Quality</td>
</tr>
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<td></td>
<td>C. Profit</td>
</tr>
<tr>
<td></td>
<td>• Net profit</td>
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<tr>
<td></td>
<td>• Income</td>
</tr>
<tr>
<td></td>
<td>• Expenses</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. Compile notes for the notebook.</td>
</tr>
<tr>
<td>B. Supervised study of costs related to each factor</td>
<td>B. Actively research cost factors assigned to a particular group.</td>
</tr>
<tr>
<td>C. Group activity researching factors. Select a group leader.</td>
<td>C. Prepare the item researched for presentation to the total class.</td>
</tr>
<tr>
<td>D. Allow each group to report its results to the class.</td>
<td></td>
</tr>
<tr>
<td>E. Have Extension Service specialists report on cost items of specific crops.</td>
<td></td>
</tr>
</tbody>
</table>

A. Supervised study
B. Class discussion
C. Guest speaker from a vegetable processing plant - topic: prices paid.
D. Analysis of crop reporting service data agriculture and markets.
E. Group activity - set up group for each crop, select a group leader.

A. Participate in class discussion
B. Question the speaker
C. Compile information in the notebook.

A. Oral or written test on cost, income, and profit calculation.
B. Teacher evaluation of prepared information in notebook.

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 2 - Negotiating contracts with vegetable processors** | **Objective 6**  
Determine 4 factors used in negotiating a growing contract with processors. |
| | A. Needs of the processor  
B. Needs of the grower  
C. Needs of the consumer  
D. Legality of contract  
E. Individuals involved |
| **Objective 7**  
List 10 items which need to be considered in developing a honified written contract. | A. Names of producer and buyer  
B. Dates of contract  
C. Terms of contract  
D. Producer  
E. Variety of vegetable  
F. Time of planting  
G. Quality  
H. Grade  
I. Processor  
J. Grades  
K. Amount contracted  
L. Open market  
M. Prices |
| **Objective 8**  
Develop a growing and marketing contract for a specific vegetable crop. | A. Amounts to be delivered  
B. Date of delivery  
C. Transportation  
D. Quality of product  
E. Price |
| **Unit 3 - Cultural practices for vegetable production** | **Objective 9**  
Demonstrate techniques needed to operate equipment used to fit soil, plant, and produce vegetable crops. |
| | A. Safety and operation  
B. Tillage equipment  
C. Planting equipment  
D. Spraying equipment  
E. Dusting equipment |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>A. Participate in class discussion</td>
<td>A. Oral or written test on factors and reasoning for the development of contracts.</td>
</tr>
<tr>
<td>B. Field trip to processing plant</td>
<td>B. Participate in field trip</td>
<td>B. Field trip report grade</td>
</tr>
<tr>
<td>C. Guest speaker - contractor from processing plant</td>
<td>C. Compile notes</td>
<td></td>
</tr>
</tbody>
</table>

| | | |
| A. Class discussion | A. Participate in class discussion | A. Teacher evaluation of students' notes |
| B. Panel discussion | B. Prepare for panel discussion | B. Students prepare a written contract for a specific commodity. |
| C. Supervised study | C. Compile notes | |

| A. Supervised study | A. Prepare the contract | A. Teacher evaluation of the prepared contract |
| B. Class discussion of the contract | | B. Students prepare a written contract for a specific commodity. |

<p>| A. Lecture/discussion | A. Participate in class discussion | A. Teacher evaluation of student's ability to operate equipment used in vegetable production. |
| B. Demonstration of equipment | B. Observe demonstration | B. Quiz on safety procedures. |
| C. Field trip to observe equipment being operated | C. Participate in field trip | |
| D. Supervised practice | D. Operate equipment | |</p>
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td>Objective 10</td>
<td>A. Chemical</td>
</tr>
<tr>
<td></td>
<td>Certification requirements</td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
</tr>
<tr>
<td></td>
<td>Availability</td>
</tr>
<tr>
<td></td>
<td>Cost</td>
</tr>
<tr>
<td>Objective 11</td>
<td>B. Mechanical</td>
</tr>
<tr>
<td></td>
<td>Equipment</td>
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<tr>
<td></td>
<td>Labor</td>
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<tr>
<td></td>
<td>Cost</td>
</tr>
<tr>
<td>Objective 12</td>
<td>A. Insecticides affect on</td>
</tr>
<tr>
<td></td>
<td>Chewing</td>
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<td></td>
<td>Sucking</td>
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<tr>
<td></td>
<td>Contact</td>
</tr>
<tr>
<td>Objective 13</td>
<td>B. Collection of insects</td>
</tr>
<tr>
<td>Objective 13</td>
<td>A. Families</td>
</tr>
<tr>
<td></td>
<td>B. Classification</td>
</tr>
<tr>
<td></td>
<td>C. Categorization according to crop attacked</td>
</tr>
<tr>
<td>Objective 13</td>
<td>A. Average yearly rainfall</td>
</tr>
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<td>B. Rainfall required for the crop</td>
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<td>C. Irrigation</td>
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<td>Costs</td>
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<td>Types of systems</td>
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<td></td>
<td>Pump</td>
</tr>
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<td>Gravity</td>
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</tbody>
</table>

Unit 4 - Harvesting and packing techniques for processing vegetables.

Objective 14

List the quality evaluations used in selecting and grading the vegetables listed in objective 2.

A. State grades
B. Federal grades
### Producing Vegetable Crops for Processing

**TEACHING METHODS**

<table>
<thead>
<tr>
<th>Method 1</th>
<th>Method 2</th>
<th>Method 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>B. Class discussion</td>
<td>C. Invite a grower and Extension Service to discuss chemical and mechanical weed control for specific crops in the region.</td>
</tr>
</tbody>
</table>

**STUDENT APPLICATION ACTIVITIES**

<table>
<thead>
<tr>
<th>Activity 1</th>
<th>Activity 2</th>
<th>Activity 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Participate in class discussion.</td>
<td>B. Compile notes</td>
<td>C. List methods of weed control.</td>
</tr>
</tbody>
</table>

**EVALUATION PROCEDURES**

<table>
<thead>
<tr>
<th>Procedure 1</th>
<th>Procedure 2</th>
<th>Procedure 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Teacher evaluation of student list of acceptable means of weed control.</td>
<td>A. Compile notes</td>
<td>A. Teacher evaluation of student list of acceptable means of weed control.</td>
</tr>
</tbody>
</table>

**TEACHING METHODS**

<table>
<thead>
<tr>
<th>Method 4</th>
<th>Method 5</th>
<th>Method 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>B. Insect collection and laboratory demonstration and practice.</td>
<td></td>
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</tbody>
</table>

**STUDENT APPLICATION ACTIVITIES**

<table>
<thead>
<tr>
<th>Activity 4</th>
<th>Activity 5</th>
<th>Activity 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Compile notes</td>
<td>B. Collect insects</td>
<td>C. Recommend insecticide to use in controlling insects.</td>
</tr>
</tbody>
</table>

**EVALUATION PROCEDURES**

<table>
<thead>
<tr>
<th>Procedure 7</th>
<th>Procedure 8</th>
<th>Procedure 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Oral or written test on types of, and effects of, insecticides on the vegetables selected.</td>
<td>A. Teacher evaluation of student list of acceptable means of weed control.</td>
<td>A. Teacher evaluation of student identification of pests.</td>
</tr>
</tbody>
</table>

**TEACHING METHODS**

<table>
<thead>
<tr>
<th>Method 10</th>
<th>Method 11</th>
<th>Method 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>B. Demonstration of identifying pests</td>
<td>C. Supervised practice</td>
</tr>
</tbody>
</table>

**STUDENT APPLICATION ACTIVITIES**

<table>
<thead>
<tr>
<th>Activity 13</th>
<th>Activity 14</th>
<th>Activity 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Compile notes</td>
<td>B. Observe demonstration</td>
<td>C. Categorize crop with pests</td>
</tr>
</tbody>
</table>

**EVALUATION PROCEDURES**

<table>
<thead>
<tr>
<th>Procedure 16</th>
<th>Procedure 17</th>
<th>Procedure 18</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Teacher evaluation of student's reasoning for selecting or rejecting irrigation.</td>
<td>A. Compile notes</td>
<td>A. Oral or written test listing the quality of vegetable grades used for 6 specific vegetables.</td>
</tr>
</tbody>
</table>

**TEACHING METHODS**

<table>
<thead>
<tr>
<th>Method 19</th>
<th>Method 20</th>
<th>Method 21</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study market grades</td>
<td>B. Field trip to vegetable processing plant</td>
<td>C. Invite field personnel from processing plant to school, discuss producing quality vegetables, grading standards and maintaining quality from farm to plant.</td>
</tr>
</tbody>
</table>

**STUDENT APPLICATION ACTIVITIES**

<table>
<thead>
<tr>
<th>Activity 22</th>
<th>Activity 23</th>
<th>Activity 24</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Compile notes</td>
<td>B. Participate in the field trip.</td>
<td></td>
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</table>

**EVALUATION PROCEDURES**

<table>
<thead>
<tr>
<th>Procedure 25</th>
<th>Procedure 26</th>
<th>Procedure 27</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Oral or written test listing the quality of vegetable grades used for 6 specific vegetables.</td>
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<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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</tr>
</tbody>
</table>
| Objective 15       | A. Farmer owned equipment  
|                    | B. Custom work             |
| Objective 16       | A. Safety  
|                    | B. Alertness  
|                    | C. Efficiency  
|                    | D. Maintenance of equipment  
|                    | E. Servicing of equipment  |
| Objective 17       | A. Quality indicated in the contract  
|                    | B. Estimation of maturity  
|                    | C. Using tenderometer  |
| Objective 18       | A. Immediate delivery  
|                    | B. Refrigeration  
<p>|                    | C. Care in handling  |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Compile notes</td>
<td>A. Teacher evaluation of the written comparison.</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Class discussion B. Teacher demonstration C. Supervised practice</td>
<td>A. Participate in class discussion. B. Observe demonstrations. C. Practice operating the machine.</td>
<td>A. Teacher evaluation of student progress in learning to operate the harvesting equipment. B. Oral or written test</td>
</tr>
<tr>
<td>A. Guest speaker from processing company</td>
<td>A. Compile notes</td>
<td>A. Teacher evaluation of student ability to determine the optimum time to harvest.</td>
</tr>
<tr>
<td>B. Field trip to field to observe crop ready to be harvested.</td>
<td>B. Participate in field trip</td>
<td></td>
</tr>
<tr>
<td>A. Field trip B. Class discussion</td>
<td>A. Compile notes B. Participate in field trip C. Prepare a report on how to handle crops for presentation of quality.</td>
<td>A. Oral or written test on methods of handling crops for the least damage in handling and transport.</td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - Producing Vegetable Crops for Processing

RESOURCE MATERIALS:

A. Periodicals
Cropping Up
Cooperative Extension mailings

I.I.S. Rm. 19, Stone Hall, Cornell University, Ithaca, New York 14853

Film Strips
F202 Soil Structure
F203 Soil Color
F204 Soil Texture
F206 Collecting and Preparing Soil Samples
F207 Soil Acidity and Testing pH
F201S Soil and Its Properties
F201F Fertilizer Elements
F303 Weed Control - Cultural and Chemical
F301S Weeds

B. Bulletins
Common Insects C903
Common Insects of Vegetables C.E.B. 1035
Vegetable Diseases C.E.B. 1034
Field Crops Cost and Returns Ag. Econ. Res. Yearly
Cost and Returns on Snap Beans Production, Ag Econ. Res. Yearly
Cornell Recommends for Veg. Crops, yearly
Farm Management Handbook, Ag Econ. Ext. 440 (yearly)

Books
Snowden & Donahoo
Profitable Farm Marketing, Prentice Hall, Englewood Cliff, N.Y.

Ware McCallum
Producing Vegetable Crops, 2nd edition,
The Interstate Printers and Publishers, Inc., Danville, Ill.

C. Processing Plant Personnel  Gerbers Baby Foods  Curtis Burns
     Beechnut Baby Foods  Profac

438
TITLE: Anesthesia and Euthanasia

DESCRIPTION:

The student will learn to assist a veterinarian or doctor give anesthesia to an animal. The student will learn how to hold an animal in a state of anesthesia while assisting a veterinarian. The anesthesia methods will include not only the topical and inhalation system but also the injectable methods.

The student will learn the humane methods of killing an animal at the directions of the veterinarian. The methods of euthanasia include both the physical techniques such as cervical fractures and the chemical methods including both the overdose of anesthesia and use of approved gases.

Emphasis will be placed on the importance of the proper use of the methods being taught and that they should be used under the supervision of a veterinarian or supervisor.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Factors Governing Choice of Anesthetic</td>
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<tr>
<td>2. Mode of Administration</td>
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<tr>
<td>3. Stages of General Anesthesia</td>
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<tr>
<td>4. Euthanasia</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2</strong></td>
</tr>
</tbody>
</table>

Revised August '75

439
OBJECTIVES to be obtained:
The student will be able to:

1. Administer local or general anesthesia under the directions of a veterinarian or supervisor.
2. Hold an animal in the state of anesthesia under the guidance of a veterinarian or supervisor.
3. Use inhalation and injection methods of administering anesthesia.
4. Terminate an animal using the humane methods and physical techniques of cervical fractures and the chemical methods such as overdoses of anesthesia or use of approved gases.
# Anesthesia and Euthanasia

## Objectives by Unit

### Unit 1 - Factors Governing Choice of Anesthetic

**Objective 1**
Administer local or general anesthesia under the directions of a veterinarian or supervisor.

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Species of animal</td>
</tr>
<tr>
<td>B. Surgical site</td>
</tr>
<tr>
<td>C. Duration of anesthesia</td>
</tr>
<tr>
<td>D. Post-operative fate</td>
</tr>
<tr>
<td>E. Health of animals</td>
</tr>
</tbody>
</table>

### Unit 2 - Mode of Administration

**Objective 2**
Hold an animal in the state of anesthesia under the guidance of a veterinarian or supervisor.

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Topical</td>
</tr>
<tr>
<td>B. Inhalation</td>
</tr>
<tr>
<td>C. Injection</td>
</tr>
<tr>
<td>D. Duration</td>
</tr>
</tbody>
</table>

#### Inhalation
- Chamber system
- Open system
- Closed system

#### Injection
- Subcutaneous
- Intravenous
- Spinal

#### Duration
- Short term
- Long term

### Unit 3 - Stages of General Anesthesia

**Objective 3**
Use inhalation and injection methods of administering anesthesia

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Analgesia</td>
</tr>
<tr>
<td>B. Excitement</td>
</tr>
<tr>
<td>C. Surgical anesthesia</td>
</tr>
<tr>
<td>D. Asphyxia</td>
</tr>
<tr>
<td>Teaching Methods</td>
</tr>
<tr>
<td>------------------------------------</td>
</tr>
<tr>
<td>A. Lecture/Discussion</td>
</tr>
<tr>
<td>B. Demonstration of anesthesia equipment</td>
</tr>
<tr>
<td>A. Field trip to operating room to observe demonstration.</td>
</tr>
<tr>
<td>B. Supervised practice</td>
</tr>
<tr>
<td>A. Class discussion</td>
</tr>
<tr>
<td>B. Demonstrations on various stages of anesthesia</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>A. Participate in class discussion</td>
</tr>
<tr>
<td>B. Observe demonstration</td>
</tr>
<tr>
<td>C. Practice the demonstrated techniques</td>
</tr>
</tbody>
</table>

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### OBJECTIVES BY UNIT

#### Unit 4 - Euthanasia

**Objective 4**
Terminate an animal using the humane methods and physical techniques of cervical fractures and the chemical methods such as overdoses of anesthesia or use of approved gases.

### CONTENT

<table>
<thead>
<tr>
<th>Physical</th>
<th>Chemical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Captive</td>
<td>Injectable agents</td>
</tr>
<tr>
<td>Vacuum</td>
<td>Barbiturates</td>
</tr>
<tr>
<td></td>
<td>Magnesium sulfate</td>
</tr>
<tr>
<td></td>
<td>Inhalable agents</td>
</tr>
<tr>
<td></td>
<td>ether, chloroform</td>
</tr>
<tr>
<td></td>
<td>carbon dioxide</td>
</tr>
<tr>
<td></td>
<td>carbon monoxide</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Compile notes</td>
</tr>
<tr>
<td>B. Demonstration</td>
<td>B. Observe demonstration</td>
</tr>
<tr>
<td>C. Field trip</td>
<td>C. Participate in field trip</td>
</tr>
<tr>
<td>D. Supervised practice</td>
<td>D. Practice demonstrated techniques</td>
</tr>
</tbody>
</table>
Title: Anesthesia and Euthanasia

RESOURCE MATERIALS

Books:

The I.A.T. Manual of Laboratory Animal Practice and Techniques
D. J. Short and Dorothy P. Woodruff
Charles C. Thomas
Springfield, Illinois

Experimental Animal Anesthesiology
U.S.A.F.
Brooks Air Force Base, Texas

An Introduction to the Anesthesia of Laboratory Animals
UFAW
London, England

Films:

Equine Anesthesia
Abbott Universal
Chicago, Illinois

Fire and Explosion Hazards from Flammable Anesthesia
Abbott Universal
Chicago, Illinois

Epidural Anesthesia in the Hog
American Veterinary Medical Association
Chicago, Illinois
DESCRIPTION:

The student will learn to obtain blood from small animals from both capillaries and veins. The veins from which the student will learn to draw blood include tail veins of rats and mice, the orbital venous plexus of rats and mice, as well as ear (marginal) veins of rabbits and leg and jugular veins of other small animals such as cats and dogs. The student will also learn to draw both capillary and venous blood from birds.

The student will learn to inject animals including, intravenous, intraperitoneal, intranasal, as well as intramuscular and subcutaneous. Other methods of injecting such as intranasal, intraocular and percutaneous will be included. In order to give proper injections the student will learn to calculate weights and measurements along with learning to convert temperature scales.

The student will learn to handle new, unhandled animals and learn to use normal animal responses to train small animals such as birds and rats.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Obtaining Blood Specimens from Small Animals</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>2. Injecting Animals</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>3. Calculations in Animal Care</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>4. Conditioning Small Animals</td>
<td>0 ( \frac{3}{27} ), ( \frac{5}{27} )</td>
<td></td>
</tr>
</tbody>
</table>
OBJECTIVES to be obtained:
The student will be able to:

1. Obtain capillary blood from the tail of rats and mice.
2. Obtain capillary blood from rabbits, birds and other small animals.
3. Obtain venous blood from both the tail and orbital venous plexes of rats and mice.
4. Obtain venous blood from rabbits, birds, cats and dogs, and other small animals.
5. Obtain heart blood from birds and small mammals.
6. Inject animals orally or by stomach tube.
7. Administer subcutaneous injections to small animals.
8. Administer intravenous injections to small animals.
9. Administer intraperitoneal injections to small animals.
10. Administer intradermal, intramuscular and intracerebral injections to small animals.
11. Administer intranasal, intracutaneous or percutaneous injections to small animals.
12. Calculate the different weights and measurements used in animal care.
13. Convert temperature scale readings from centigrade to Fahrenheit and Fahrenheit to centigrade.
14. Handle new previously unhandled animals.
15. Use normal animals responses to train small animals such as birds and rats.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Obtaining Blood Specimens from Small Animals</strong>&lt;br&gt;Objective 1&lt;br&gt;Obtain capillary blood from the tail of rats and mice</td>
<td>A. Capillary Bleeding&lt;br&gt;  - Rats&lt;br&gt;  - Mice</td>
</tr>
<tr>
<td>Objective 2&lt;br&gt;Obtain capillary blood from rabbits, birds and other small animals</td>
<td>A. Capillary Bleeding&lt;br&gt;  - Rabbits&lt;br&gt;  - Birds&lt;br&gt;  - Small animals</td>
</tr>
<tr>
<td>Objective 3&lt;br&gt;Obtain venous blood from both the tail and orbital venous plexes of rats and mice</td>
<td>A. Obtaining venous blood from:&lt;br&gt;  - Rats&lt;br&gt;  - Mice&lt;br&gt;  - tail veins&lt;br&gt;  - orbital venous plexus</td>
</tr>
<tr>
<td>Objective 4&lt;br&gt;Venous blood from rabbits, birds, cats, dogs and other small animals</td>
<td>A. Obtaining venous blood from:&lt;br&gt;  - Rabbits&lt;br&gt;  - ear veins&lt;br&gt;  - Primates&lt;br&gt;  - Avian species&lt;br&gt;  - Cats&lt;br&gt;  - Dogs&lt;br&gt;  - Other animals</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------</td>
</tr>
</tbody>
</table>
| A. Supervised study  
B. Demonstrations  
C. Movies and film strips  
D. Laboratory exercises  | A. Classroom and laboratory notes  
B. Laboratory exercises in obtaining capillary blood from rats and mice  | A. Laboratory exercise grade  
B. Performance on laboratory techniques and obtaining blood  
C. Oral grade on laboratory procedures  |
| A. Demonstrations  
B. Laboratory exercises  
C. Film strips  | A. Complete laboratory exercises  
B. Notes on demonstrations and laboratory exercises  | A. Performance grade on laboratory exercises obtaining capillary blood  |
| A. Supervised study  
B. Classroom discussion  
C. Demonstrations  
D. Laboratory exercises  
E. Film strips  | A. Laboratory exercises in bleeding small animals obtaining venous blood  
B. Classroom demonstrations and laboratory notes  | A. Written test  
B. Laboratory exercise test. Performance grade  |
| A. Supervised study  
B. Classroom discussion  
C. Demonstrations  
D. Laboratory exercises  
E. Film strips  | A. Laboratory exercises in bleeding small animals obtaining venous blood  
B. Classroom demonstrations and laboratory notes  | A. Written test  
B. Laboratory exercise test. Performance grade  |
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td>Objective 5</td>
<td>A. Obtaining heart blood</td>
</tr>
<tr>
<td>Obtain heart blood from birds and small animals</td>
<td>. Rats and mice</td>
</tr>
<tr>
<td></td>
<td>. Guinea pigs</td>
</tr>
<tr>
<td></td>
<td>. Rabbits</td>
</tr>
<tr>
<td></td>
<td>. Birds</td>
</tr>
<tr>
<td></td>
<td>. Other animals</td>
</tr>
<tr>
<td>B. Locate and identify the pericardium heart chambers and valves, major arteries and veins in preserved dissection specimen</td>
<td></td>
</tr>
<tr>
<td>C. Anatomy of the heart</td>
<td>. Chambers</td>
</tr>
<tr>
<td></td>
<td>. Valves</td>
</tr>
<tr>
<td></td>
<td>. Blood flow patterns</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Unit 2 - Injecting Animals</th>
<th>A. Internal injections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 6</td>
<td>. Orally</td>
</tr>
<tr>
<td>Inject animals orally or by stomach tube</td>
<td>. Stomach catheter</td>
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</table>

<table>
<thead>
<tr>
<th>Objective 7</th>
<th>A. Parenteral injections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administer subcutaneous injections to small animals</td>
<td>B. Subcutaneous injections</td>
</tr>
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</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Laboratory exercises in locating and identifying the pericardium, heart chambers and valves, master arteries and veins.</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Demonstrations</td>
<td>B. Obtain heart blood samples from laboratory specimens.</td>
<td>B. Oral test</td>
</tr>
<tr>
<td>C. Laboratory exercises</td>
<td>C. Notes on supervised study, demonstrations, guest speakers and laboratory work.</td>
<td>C. Performance grade on laboratory work</td>
</tr>
<tr>
<td>D. Film strips and movies</td>
<td></td>
<td>D. Notebook grade</td>
</tr>
<tr>
<td>E. Field trip to state or private small animal laboratory</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Invites veterinarian to class as a resource person to lecture and demonstrate obtaining heart blood</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A. Demonstrations
B. Film strips
C. Laboratory exercises

A. Demonstrations
B. Laboratory exercises

A. Demonstrations
B. Laboratory exercises

A. Administer oral and stomach internal injections using small animals in the schools laboratory

A. Administer subcutaneous injections in small animals

A. Performance test--laboratory procedures, techniques and methods
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENTS</th>
</tr>
</thead>
</table>
| Objective 8       | A. Intravenous injections  
|                   |   . Rats                 
|                   |   . Mice                 
|                   |   . Rabbits              
|                   |   . Birds                |
| Objective 9       | A. Intraperitoneal injections  
|                   |   . Rats                 
|                   |   . Mice                 |
| Objective 10      | A. Intradermal injections  
|                   | B. Intramuscular injections |
|                   | C. Intracerebral injections |
| Objective 11      | A. Other sites of injections  
|                   |   . Intranasal            
|                   |   . Intraocular           
|                   |   . Percutaneous          |

A. Intravenous injections
B. Intraperitoneal injections
C. Intradermal injections
B. Intramuscular injections
C. Intracerebral injections
A. Other sites of injections
   . Intranasal
   . Intraocular
   . Percutaneous
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study for basic information related to anatomy and procedures</td>
<td>A. Perform intravenous injections using small animals in the school laboratory</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Demonstrations</td>
<td></td>
<td>B. Laboratory performance test</td>
</tr>
<tr>
<td>C. Laboratory exercises</td>
<td></td>
<td>C. Work experience grade</td>
</tr>
<tr>
<td>D. Invite veterinarian to laboratory as a guest speaker and to demonstrate techniques</td>
<td>B. If possible, use skills acquired in work experience programs under the supervision of qualified personnel</td>
<td>D. Notebook grade</td>
</tr>
<tr>
<td>A. Demonstrations</td>
<td>A. Perform intraperitoneal injections using school laboratory animals</td>
<td>A. Laboratory exercises</td>
</tr>
<tr>
<td>B. Laboratory exercises</td>
<td></td>
<td>B. Laboratory performance test</td>
</tr>
<tr>
<td>C. Overlays</td>
<td>A. Notes on demonstrations, laboratory exercises and teacher-student discussions</td>
<td>C. Notes on demonstrations and laboratory exercises</td>
</tr>
<tr>
<td>D. Film strips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Demonstrations</td>
<td>A. Perform intradermal, intramuscular and intracerebral injections in small animals</td>
<td>A. Performance test</td>
</tr>
<tr>
<td>B. Laboratory exercises</td>
<td></td>
<td>B. Laboratory exercise test</td>
</tr>
<tr>
<td>C. Overlays</td>
<td></td>
<td>C. Notebook grade</td>
</tr>
<tr>
<td>D. Film strips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Demonstrations</td>
<td>A. Perform intranasal, intraocular and percutaneous injections using small animals in the school laboratory</td>
<td>A. Performance test</td>
</tr>
<tr>
<td>B. Laboratory exercises</td>
<td></td>
<td>B. Laboratory exercise test</td>
</tr>
<tr>
<td>C. Overlays</td>
<td></td>
<td>C. Notebook grade</td>
</tr>
<tr>
<td>D. Film strips</td>
<td>B. Notes on demonstrations and laboratory exercises</td>
<td></td>
</tr>
</tbody>
</table>
OBJECTIVES BY UNIT

Unit 3 - Calculations used in Animal Care
Objective 12
Calculate the different weights and measurements used in animal care

Objective 13
Convert temperature scale readings from centigrade to Fahrenheit and Fahrenheit to centigrade

Unit 4 - Conditioning Small Animals
Objective 14
Handle new, previously unhandled animals

Objective 15
Use normal animals responses to train small animals such as birds and rats

CONTENT

A. Weights and measures
B. Equivalents
   - Weights
   - Volumes
   - Linear measurements
C. Metric units
D. Temperatures

A. Temperature conversions
   - Fahrenheit to centigrade
   - Centigrade to Fahrenheit

A. Taming new animals
   - Handling new animals
   - Feeding new animals
   - Management of new animals

A. Teaching small animals
   - Response to noise
   - Response to colors
   - Use of reactions for teaching small animals to react

504
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Notes on supervised study, classroom discussion, demonstration, and laboratory exercises</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Classroom discussion</td>
<td>B. Calculate the different weights and measurements used in small animal care</td>
<td>B. Notebook grade</td>
</tr>
<tr>
<td>C. Demonstrations</td>
<td>C. Laboratory exercise test</td>
<td>C. Laboratory exercise test</td>
</tr>
<tr>
<td>D. Laboratory exercises</td>
<td></td>
<td>. Oral</td>
</tr>
<tr>
<td></td>
<td></td>
<td>. Written</td>
</tr>
</tbody>
</table>

| A. Laboratory exercises | A. Notes on laboratory exercise | A. Written quiz |
| B. Demonstrations | B. Assign students to record outdoor temperatures for several days and convert the readings to opposite scale readings | |
| | | |

| A. Supervised study | A. Handle new, previously unhandled animals in the school's laboratory | A. Performance grade on handling new unhandled animals |
| B. Demonstrations | | |
| C. Field trip to facilities that work with small animals | | |
| D. Laboratory exercises | | |

| A. Laboratory exercises | A. Use normal animal responses to train small animals such as birds and rats | A. Oral quiz |
| B. Demonstrations | | B. Laboratory exercise test |
| C. Supervised study | | C. Performance grade |

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11
RESOURCE MATERIALS

A. Books -

The I.A.T. Manual of Laboratory Animal Practice and Techniques
F.J. Short & Dorothy P. Woodnott
Springfield, Ill.

B. Periodicals

Laboratory Animal Care
Official Publication of the American Association for Laboratory Animal Science.
Joliet, Illinois

C. Refer to package for data
DESCRIPTION:

The student will relate the legal requirements of maintaining animals in captivity as well as the laws protecting other animals. The laws governing the transportation, laboratory use, showing and sale of animals will be covered. The student will demonstrate how to package an animal for shipment and insure that there is sufficient moisture available to supply the animals needs for water without endangering the health of the animal.

The students will practice the various methods of keeping records on animals required by law as well as those used in business or laboratory use. In keeping records it is important that the individual animals be identifiable. Therefore, the student will practice the various methods of marking the different species of animals. The marking will include the temporary methods such as collars, stains and bands and the permanent methods such as tattooing and ear and toe clipping.

<table>
<thead>
<tr>
<th>MAJOR DIVISIONS OR UNITS OF CONTENT</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Welfare laws affecting animals</td>
<td>3</td>
</tr>
<tr>
<td>2. Housing animals</td>
<td>1</td>
</tr>
<tr>
<td>3. Transporting animals</td>
<td>1</td>
</tr>
<tr>
<td>4. Marking animals and cages</td>
<td>(\frac{1}{6})</td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS

Code - 01.0101010705-01

OBJECTIVES to be obtained:

The student will be able to:

1. List the basic concepts of the laws governing the welfare of animals.
2. List the basic concepts of the laws affecting animals used in laboratories.
3. List the advantages and disadvantages of various types of caging and cage materials.
4. Properly sanitize all types of laboratory caging.
5. Properly house animals.
6. Set up cartons or cages for transport and plan safe shipment.
7. Receive animals and handle them to insure complete animal safety.
8. Label all types of laboratory caging.
9. Mark animals using collars, leg bands, ear tags, tattooing, ear and toe clipping.
10. Use the markings and keep records on all laboratory animals.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Welfare laws affecting animals</strong></td>
<td><strong>A.</strong> Federal and State laws affecting animal protection, hunting, fishing, and trapping.</td>
</tr>
</tbody>
</table>
| Objective 1. List the basic concepts of the laws governing the welfare of animals. | - Protecting animals in the fields  
- Preventing cruelty to animals  
- Dealing with slaughter and slaughtering  
- Dealing with work animals  
- Dealing with show animals |
| Objective 2. List the basic concepts of the laws effecting animals used in laboratories. | **A.** Laws effecting laboratories.  
**B.** Transportation of laboratory animals.  
**C.** Laws effecting dealers of laboratory animals.  
**D.** Animal Welfare Act as applied to other areas. |
### EDUCATION

**LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS**

<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Classroom lecture and discussion</td>
<td>A. Students will list what actions they would be able to take to correct 10 infractions of laws affecting:</td>
<td>A. Written test on:</td>
</tr>
<tr>
<td>B. Movies</td>
<td>. Protection of animals</td>
<td>. The basic concepts of the laws affecting:</td>
</tr>
<tr>
<td>C. Supervised study to review state and federal laws</td>
<td>. Prevention of cruelty</td>
<td>. animals in the field</td>
</tr>
<tr>
<td>D. Field trips to the local conservation headquarters and fields to see how the laws governing animals in the fields operate.</td>
<td>. Slaughter and slaughtering</td>
<td>. prevention of cruelty</td>
</tr>
<tr>
<td>E. Guest speakers--animal conservationist, zoologist, game wardens, ASPCA representatives</td>
<td>. Work animals</td>
<td>. slaughter and slaughtering animals</td>
</tr>
<tr>
<td>F. Use of specific legal cases concerning animals as examples.</td>
<td>. Show animals</td>
<td>. work animals</td>
</tr>
<tr>
<td>G. Field trip to zoo, university, ASPCA.</td>
<td>B. Use past legal cases regarding legal infractions. Record notes.</td>
<td>. show animals</td>
</tr>
</tbody>
</table>

| | | B. Essay question on the steps that may be taken to start the correction of an illegal action connected with animals. |

| | | A. Essay questions on: |
| | | . Laws affecting laboratory animals |
| | | . Laws governing the sale of animals for laboratory use. |
| | | . Laws governing the transportation of laboratory animals. |
| | | B. Notebook grade |

- A. State and federal publications, texts, movies.
- B. Student notes on movies.
- C. Guest speaker--ASPCA inspectors, laboratory veterinarian, breeding farm representative, animal transport person.
- D. Field trips to laboratories and dealers of laboratory animals to see the effect of the laws.

A. Students will record notes regarding specific legal problems dealing with laboratory animals.

B. Have students discuss experiences of past legal cases in their community.

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<table>
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<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td>Unit 2 - Housing animals</td>
<td>A. Types of cages:</td>
</tr>
<tr>
<td>Objective 3</td>
<td>- Materials used</td>
</tr>
<tr>
<td>List the advantages and disadvantages</td>
<td>- Cage functions</td>
</tr>
<tr>
<td>of various types of caging and cage</td>
<td>- Cage sizes</td>
</tr>
<tr>
<td>materials.</td>
<td>- Number of animals permitted in</td>
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<td></td>
<td>enclosures.</td>
</tr>
<tr>
<td></td>
<td>C. Types of beddings and cage floors.</td>
</tr>
<tr>
<td>Objective 4</td>
<td>A. Methods of cleaning cages</td>
</tr>
<tr>
<td>Properly sanitize all types of</td>
<td>- Equipment required</td>
</tr>
<tr>
<td>laboratory caging.</td>
<td>- Water</td>
</tr>
<tr>
<td></td>
<td>- Sanitizers</td>
</tr>
<tr>
<td>Objective 5</td>
<td>A. Selecting proper housing</td>
</tr>
<tr>
<td>Properly house animals</td>
<td>- Environmental considerations</td>
</tr>
<tr>
<td></td>
<td>- Types of animals</td>
</tr>
<tr>
<td></td>
<td>- Housing requirements</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Demonstration of various types of cages and cage materials.</td>
<td>A. Students will maintain animals in all types of cages made of various materials.</td>
</tr>
<tr>
<td>B. Discussion of advantages and disadvantages of each.</td>
<td>A. The student will demonstrate his ability to sanitize 5 different types of laboratory caging.</td>
</tr>
<tr>
<td>C. Field trips</td>
<td>A. Students will clean all cages properly, using various disinfectants and bedding whenever required to maintain proper sanitation.</td>
</tr>
<tr>
<td>A. Demonstration of proper cleaning techniques for caging</td>
<td>A. Perform experiments in changing the environment of animals and</td>
</tr>
<tr>
<td>- Exhibit and discuss different disinfecting agents</td>
<td>B. Keep records on animal behavior, animal health, and animal disposition</td>
</tr>
<tr>
<td>- Exhibit and discuss various types of bedding.</td>
<td>C. Keep animals under the best possible environmental condition at all times.</td>
</tr>
<tr>
<td>A. Discussion and demonstration of proper environmental control</td>
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<td>- Numbers of animals housed in a given area</td>
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<tr>
<td>- Types of housing facilities</td>
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<tr>
<td>B. Movies</td>
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<tr>
<td>C. Discussion on state and federal publications of laboratory animal housing regulations</td>
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</table>

Temperature
Humidity
Ventilation
# OBJECTIVES BY UNIT

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<tr>
<th>Unit 3 - Transporting animals</th>
<th>Objective 6</th>
<th>Set up cartons or cages for transport and plan safe shipment</th>
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</thead>
<tbody>
<tr>
<td>Objective 7</td>
<td></td>
<td>Receive animals and handle them to insure complete animal safety</td>
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</table>

<table>
<thead>
<tr>
<th>Unit 4 - Marking animals and cages</th>
<th>Objective 8</th>
<th>Label all types of laboratory caging.</th>
</tr>
</thead>
</table>

## CONTENT

- **A. Shipping cartons or cages for shipping animals.**
  - Disposable containers
  - Returnable cages
- **B. Methods of shipping and requirements**
  - **A. Air**
  - **B. Truck or rail**
  - **C. Temperature and space/animal**
  - **D. Laws on interstate**
    - Shipping
    - Receiving
  - **A. Marking cages**
    - Tags or cards
    - Records
<table>
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<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Classroom discussion</td>
<td>A. Laboratory exercises in packaging animals for shipment.</td>
<td>A. Laboratory performance test.</td>
</tr>
<tr>
<td>B. Speakers—animal breeders and shippers, technicians dealing with receiving animal shipments.</td>
<td>B. Laboratory exercises in making shipping cartons and cages.</td>
<td>. Prepare property transport cages for 5 different species of animals.</td>
</tr>
<tr>
<td>A. Field trip to places where animals are shipped and received, animal holding areas at airports and train stations.</td>
<td>A. Laboratory exercises in receiving shipments of animals.</td>
<td>A. Written test on steps to take to ship 3 different species to 3 different locations in the U.S.A. including:</td>
</tr>
<tr>
<td></td>
<td>B. Student notes on field trips</td>
<td>. Caging</td>
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<tr>
<td></td>
<td></td>
<td>. Shipped-truck or rail</td>
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<tr>
<td></td>
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<td>. When to be shipped</td>
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<td>. Temperature and space/animal</td>
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<td></td>
<td>. Laws affecting shipment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>. Date and appropriate time animals should be received.</td>
</tr>
<tr>
<td>A. Laboratory demonstrations</td>
<td>A. Laboratory exercises in marking cages.</td>
<td>A. Laboratory performance test.</td>
</tr>
<tr>
<td>B. Supervised study</td>
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<td>OBJECTIVES BY UNIT</td>
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<tr>
<td>Objective 9</td>
<td>A. Marking animals</td>
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<tr>
<td>Mark animals using collars, leg bands, ear tags, tattooing, ear and toe clipping.</td>
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<tr>
<td></td>
<td>B. Tattooing</td>
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<td></td>
<td>C. Ear and toe clipping</td>
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<td></td>
<td>D. Stains and dyes</td>
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<tr>
<td>Objective 10</td>
<td>A. Records required for various types of laboratory animals.</td>
<td></td>
</tr>
<tr>
<td>Use the markings and keep records on all laboratory animals.</td>
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</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
<td>EVALUATION PROCEDURES</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
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<td>--------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Demonstrate the function and use of</td>
<td>A. Marking animals individually by as many methods as possible. The student must keep proper</td>
<td>A. Properly fill out a cage tag for any species of lab animals</td>
</tr>
<tr>
<td>. All types cage marking systems</td>
<td>records on all resident animals at all times</td>
<td>B. Use all types of marking equipment safely</td>
</tr>
<tr>
<td>. Collars, leg bands, ear tags, tattooing, ear and toe</td>
<td></td>
<td>C. Keep records and find information on a particular animal efficiently. 80% accuracy</td>
</tr>
<tr>
<td>clipping</td>
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<tr>
<td>. Records in proper animal handling</td>
<td></td>
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<tr>
<td>B. Field trips to laboratories, pet stores, hospitals</td>
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<td>where animals must be marked and records kept.</td>
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<tr>
<td></td>
<td>A. Students will keep proper records on all resident animals.</td>
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<tr>
<td></td>
<td>B. Notes from classroom discussion, field trips and guest speakers.</td>
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</tr>
<tr>
<td>A. Classroom discussion</td>
<td></td>
<td>A. Grade students on accuracy, neatness and completeness of records kept.</td>
</tr>
<tr>
<td>B. Evaluate sample records acquired from laboratory</td>
<td></td>
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<tr>
<td>facilities, pet stores and areas where animals are</td>
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<tr>
<td>kept</td>
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<td>C. Invite resource people to the classroom to discuss</td>
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<tr>
<td>the importance of records.</td>
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<tr>
<td>D. Field trips to private and state facilities that</td>
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<tr>
<td>work with laboratory animals.</td>
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</tbody>
</table>

Properly fill out a cage tag for any species of lab animals.

Use all types of marking equipment safely.

Keep records and find information on a particular animal efficiently. 80% accuracy.

Students will keep proper records on all resident animals.

Notes from classroom discussion, field trips and guest speakers.

Grade students on accuracy, neatness and completeness of records kept.

Field trip reports.

Notebook grades.
Title - LEGAL RIGHTS, TRANSPORTING AND HOUSING OF ANIMALS

RESOURCE MATERIALS

Books:
4. Animals and Animal Products (Title 9) - Regulations and Standards - U. S. Department of Agriculture, Washington, D. C.

Bulletins:
1. Small Animal Bulletins - Ralston Purina, St. Louis, Missouri
DESCRIPTION:

The student will learn to establish and maintain the various types of small animal breeding programs. This will include the ability to breed a given number of offspring of a species for delivery on a given date. In order to accomplish this the student must be familiar with the general reproduction of animals. Here the student will learn to identify the various parts of the male and female reproductive systems of the small animals. This knowledge will be further used by the students who will then be able to take and read vaginal smears from small animals for purposes of determining the di-oestrous cycles of the animal.

In order to understand the different types of breeding programs the student will study genetics by breeding homozygotes, heterozygotes and various combinations of each using fruit flies, fish and small mammals. This will enable the student to better understand the inbreeding, line-breeding, and crossbreeding programs that he will be maintaining. The student will learn the gestation times and weaning ages for the various species of small animals being studied as well as some of the common problems encountered in breeding programs. As needed in all breeding programs the student will learn to keep careful records of each program.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
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<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Genes and Chromosomes</td>
<td>1</td>
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<tr>
<td>2. Genetics</td>
<td>0</td>
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<tr>
<td>3. Mammalian Reproduction</td>
<td>1</td>
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<tr>
<td>4. Di-oestrous Cycles</td>
<td>1</td>
</tr>
<tr>
<td>5. Breeding Small Animals</td>
<td>0</td>
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<tr>
<td>6. Records</td>
<td>0</td>
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<tr>
<td>7. Breeding Programs</td>
<td>1</td>
</tr>
<tr>
<td>8. Problems of Breeding Animals</td>
<td>1</td>
</tr>
</tbody>
</table>

Revised August '75
OBJECTIVES to be obtained:

The student will be able to:

1. Properly use a microscope.
2. Distinguish chromosomes in cells.
3. Know the normal number of chromosomes for the different species of small animals.
4. Work out the genetic patterns of offspring resulting from matings of homozygotes and heterozygotes and combinations of each.
5. Know the difference between genotypes and phenotypes.
6. Understand the different types of breeding systems such as inbreeding, linebreeding, crossbreeding as well as hybrids and mutations.
7. Identify the different parts of the male and female reproductive organs of small animals.
8. Outline the development of the germ cell to the fetus.
9. Know the gestation times and weaning ages for the various species of small animals.
10. Collect vaginal smears from small animals.
11. Determine the stage of dioestrous cycles of small animals from vaginal smears.
12. Establish and maintain the various types of breeding programs for small animals.
13. Maintain records for the various types of breeding programs.
14. Establish a breeding program to deliver given numbers of offspring on given days.
15. Be made aware of some of the problems of breeding small animals.
<table>
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<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td><strong>Unit 1  Genes and Chromosomes</strong></td>
<td><strong>A. Microscope</strong></td>
</tr>
<tr>
<td></td>
<td>- Parts of the microscope</td>
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<tr>
<td></td>
<td>- Adjusting the microscope</td>
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<td></td>
<td>- low power</td>
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<tr>
<td></td>
<td>- high power</td>
</tr>
<tr>
<td></td>
<td><strong>B. Preparing slides</strong></td>
</tr>
<tr>
<td></td>
<td><strong>C. Using prepared slides</strong></td>
</tr>
<tr>
<td>Objective 1</td>
<td><strong>Distinguish chromosomes in cells</strong></td>
</tr>
<tr>
<td>Properly use a microscope.</td>
<td><strong>A. Chromosomes</strong></td>
</tr>
<tr>
<td></td>
<td><strong>B. Division of chromosomes</strong></td>
</tr>
<tr>
<td></td>
<td>- Cell division</td>
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<td>- Diploid and haploid cells</td>
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<td></td>
<td><strong>C. Sex determination</strong></td>
</tr>
<tr>
<td><strong>Objective 2</strong></td>
<td><strong>Distinguish chromosomes in cells</strong></td>
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<tr>
<td><strong>Objective 3</strong></td>
<td><strong>Know the normal number of chromosomes for the different species of small animals.</strong></td>
</tr>
<tr>
<td><strong>Unit 2  Genetics</strong></td>
<td><strong>A. Number of chromosomes in different species of animals.</strong></td>
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<tr>
<td></td>
<td>- Mice</td>
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<td></td>
<td>- Cats</td>
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<td>- Dogs</td>
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<td></td>
<td>- Large animals</td>
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<td></td>
<td>- Birds</td>
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<td></td>
<td>- Fish</td>
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<td></td>
<td>- Fruit flies</td>
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<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
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<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Laboratory demonstrations</td>
<td>A. Complete laboratory exercises on the use of a microscope.</td>
</tr>
<tr>
<td>B. Use drawings of a microscope for identifying parts of a microscope.</td>
<td>B. Students prepare slides for microscope studies.</td>
</tr>
<tr>
<td>A. Transparencies related to chromosomes, cell division and sex determination.</td>
<td>A. Complete laboratory exercises</td>
</tr>
<tr>
<td>B. Teacher demonstrations using laboratory equipment and facilities.</td>
<td>B. Notes on transparencies, slides and class discussion.</td>
</tr>
<tr>
<td>C. Slides</td>
<td>C. Written test on cell division and chromosomes.</td>
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<tr>
<td>D. Class discussion</td>
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<tr>
<td>E. Laboratory exercises</td>
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</table>

A. Teacher lecture
B. Supervised study
C. Slides
D. Laboratory demonstrations and exercises

A. Class notes
B. Laboratory exercise grade

A. Written test
B. Laboratory exercise test.
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<td>Objective 4</td>
<td>A. Definition of common genetic terms</td>
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<td>• Heredity</td>
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<td>• Environment</td>
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<td>• Genes</td>
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<td>• Mitosis</td>
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<td>• Homozygotes</td>
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<td>B. Genetic patterns</td>
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<td>Objective 5</td>
<td>A. Genotype</td>
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<td>B. Phenotype</td>
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<td>C. Dominant</td>
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<td>Objective 6</td>
<td>A. Types of breeding systems</td>
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<td>• Inbreeding</td>
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<td>• Linebreeding</td>
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<td>• Crossbreeding</td>
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<td>B. Hybrids</td>
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<td>C. Mutations - gene abnormalities</td>
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<td>D. The laws of heredity</td>
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<td>E. Definitions of common terms</td>
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<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
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</thead>
<tbody>
<tr>
<td>A. Chalk and board illustra-</td>
<td>A. Student notes</td>
<td>A. Written test on definitions</td>
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<tr>
<td>tions</td>
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<td></td>
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<tr>
<td>B. Class discussion</td>
<td></td>
<td>B. Notebook grade</td>
</tr>
<tr>
<td>C. Genetic pattern charts</td>
<td></td>
<td>C. Oral examination on genetic patterns.</td>
</tr>
</tbody>
</table>

A. Demonstrations on the inheritance of characters in fruit flies, fish, mice and birds.
B. Laboratory exercises in genetics related to breeding of animals.
C. Supervised study
D. Teacher - student class and laboratory discussion
E. Slides and movies

A. Laboratory exercises in breeding fruit flies, fish, mice, birds and other laboratory animals.
B. Notes on demonstrations, slides, movies and laboratory exercises.

A. Written test
B. Laboratory test
C. Notebook grade

A. Notes on classwork, laboratory exercises and demonstrations
B. Assign projects to advanced students
C. Have advanced students work with other class members in laboratory exercises.

A. Written test
B. Notebook grade on class discussion, supervised study questions, film strips and laboratory exercises.
C. Oral questions for higher ability students.
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<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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<tr>
<td>Objective 7</td>
<td>A. Reproductive systems&lt;br&gt; - Male reproductive system&lt;br&gt; - Female reproductive system&lt;br&gt; - Germ cells</td>
</tr>
<tr>
<td></td>
<td>B. Embryonic development&lt;br&gt; - Zygote&lt;br&gt; - Fetus</td>
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<td></td>
<td>C. Gestation and Parturition&lt;br&gt; - Gestation tables&lt;br&gt; - Parturition</td>
</tr>
<tr>
<td>Objective 8</td>
<td>A. Germ cell&lt;br&gt; - Point of fertilization</td>
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<td>B. Development of embryo</td>
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<td>C. Fetal membranes or placenta</td>
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<td>D. Estrus Cycle</td>
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<td>E. Hormones involved during pregnancy</td>
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<td>F. Fetal development</td>
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<td>G. Key words and definitions</td>
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<tr>
<td>Objective 9</td>
<td>A. Gestation&lt;br&gt; - Time table for fetus development&lt;br&gt; - Parturition</td>
</tr>
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<td></td>
<td>B. Weaning ages&lt;br&gt; - Laboratory animals&lt;br&gt; - Other small animals</td>
</tr>
</tbody>
</table>
### Genetics and Breeding of Small Animals

**TEACHING METHODS**

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<th>A. Supervised study</th>
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<td>B. Class discussion</td>
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<td>C. Demonstrations</td>
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<tr>
<td>D. Laboratory exercises</td>
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<tr>
<td>E. Visual aids and models of male and female reproductive tracts.</td>
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<tr>
<td>F. Slides</td>
</tr>
<tr>
<td>G. Movies</td>
</tr>
<tr>
<td>H. Obtain reproductive organs from slaughter house animals male and female. Use organs to illustrate the anatomy and function of the organs.</td>
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<tr>
<td>G. Field trip to slaughter house.</td>
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</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

<table>
<thead>
<tr>
<th>A. Incubate fertilized eggs</th>
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<tbody>
<tr>
<td>B. Notes on laboratory exercises</td>
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<tr>
<td>C. Acquire birds for laboratory exercises.</td>
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</tbody>
</table>

### EVALUATION PROCEDURES

<table>
<thead>
<tr>
<th>A. Written test</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Laboratory exercise test.</td>
</tr>
<tr>
<td>C. Notebook grades</td>
</tr>
</tbody>
</table>

---

**TEACHING METHODS**

<table>
<thead>
<tr>
<th>A. Supervised study</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Diagrams of cell and fetal development</td>
</tr>
<tr>
<td>C. Slides</td>
</tr>
<tr>
<td>D. Movies</td>
</tr>
<tr>
<td>E. Examine reproductive tracts of female avain species.</td>
</tr>
<tr>
<td>laboratory exercise</td>
</tr>
<tr>
<td>Reproductive tract</td>
</tr>
<tr>
<td>Oviduct</td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

| A. Notes on supervised study and classroom discussion. |

### EVALUATION PROCEDURES

<table>
<thead>
<tr>
<th>A. Written test</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Oral test</td>
</tr>
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---

**Notes on laboratory exercises**

<table>
<thead>
<tr>
<th>A. Incubate fertilized eggs</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Notes on laboratory exercises</td>
</tr>
<tr>
<td>C. Acquire birds for laboratory exercises.</td>
</tr>
</tbody>
</table>

---

**Written test**

<table>
<thead>
<tr>
<th>A. Written test</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Notebook grade</td>
</tr>
<tr>
<td>C. Oral quiz</td>
</tr>
</tbody>
</table>

---

**Performance grade on posting avain species and identification of organs, their functions in fetus development.**
OBJECTIVES BY UNIT

Objective 10
Collect vaginal smears from small animals.

Unit 4 Di-oestrous cycles

Objective 11
Determine the stage of di-oestrous cycles of small animals from vaginal smears.

Unit 5 Breeding Small Animals

Objective 12
Establish and maintain various types of breeding programs for small animals.

Unit 6 Records

Objective 13
Maintain records needed for breeding programs.

CONTENT

A. Obtaining vaginal smears

A. Obtaining and reading smears and other methods of determining stages of di-oestrous cycles.
- Guinea pig
- Rabbit
- Mice
- Rats
- Cats
- Dogs
- Other animals

A. Choosing a breeding system
- Inbreeding
- Random breeding
- Harems or monogamous pairs
- Cross breeding

B. Selection of breeding stock

A. How to keep records
- Simple
- Accurate
- Complete

B. Types of records
- Males
- Females offspring
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Classroom discussion</td>
<td>A. Complete laboratory exercises.</td>
<td>A. Performance grade on laboratory exercise.</td>
</tr>
<tr>
<td>B. Demonstrations</td>
<td>B. Notes on classroom discussion and demonstrations.</td>
<td></td>
</tr>
<tr>
<td>C. Laboratory exercises</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Demonstrations</td>
<td>A. Record laboratory exercise data.</td>
<td></td>
</tr>
<tr>
<td>B. Laboratory exercises</td>
<td>B. Notes on teacher demonstrations.</td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Students could establish and maintain breeding systems required for laboratory exercises involving small animal colonies.</td>
<td>A. Written report on establishing and maintaining small animal colonies. Check on breeding systems used and rationale for the breeding systems selected.</td>
</tr>
<tr>
<td>B. Chalk and board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Demonstrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Laboratory exercises</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Movies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Field trip to research center using small animals</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| A. Supervised study | A. Keep records on animals in the school laboratory. | A. Grade on laboratory records. |
| B. Review record forms | B. Keep records on supervised work experience projects. | B. Supervised work experiences program records. |
| C. Laboratory exercises | | |
## Genetics and Breeding of Small Animals

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 7 Breeding Programs</strong></td>
<td></td>
</tr>
</tbody>
</table>
| **Objective 14**  
Establish a breeding program to deliver given numbers of offspring on given days. | A. Scheduling breeding to obtain given numbers of one sex of small laboratory animals.  
B. Scheduling breeding for production of offspring for particular dates. |
| **Unit 8 Problems of breeding animals** | |
| **Objective 15**  
Be made aware of some of the problems of breeding small animals. | A. Pseudo-pregnancy  
B. Sterility  
C. Over stock  
D. Reabsorption and miscellaneous problems |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Demonstrations</td>
<td>A. Notes on demonstrations and laboratory exercises.</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Laboratory exercises</td>
<td></td>
<td>B. Laboratory exercise grade</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Invite veterinarian to class, to discuss small animal breeding problems.</td>
<td>A. Notes on guest speaker, supervised study, field trips, and demonstrations.</td>
<td>A. Written test matching questions and essay questions.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td></td>
<td>B. Notebook grade</td>
</tr>
<tr>
<td>C. Field trips to facilities breeding small animals for laboratory purposes.</td>
<td></td>
<td>C. Laboratory exercises grades.</td>
</tr>
<tr>
<td>D. Demonstrations using post-mortem of small animals to illustrate breeding problems.</td>
<td></td>
<td>D. List problems associated with small animal breeding problems.</td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - Genetics and Breeding of Small Animals

RESOURCE MATERIALS

Books:

I.A.T. Manual of Laboratory Practice and Techniques
D. J. Short & Dorothy P. Woodnott
Charles C. Thomas
Springfield, Illinois

Animals for Research Principles of Breeding and Management
W. Lane-Petter
Academic Press
New York, New York

Audiovisual Films:

Cell Division and Growth
Abbott Laboratories
North Chicago, Ill.

1. Laws of Heredity
2. Meiosis
3. Mitosis
4. The Frog
5. Lambing
6. Reproduction Among Animals
The above films may be obtained from Encyclopedia Britannica Education Dept.
Chicago, Ill.

1. Genetics: Mendel's Law
2. Reproduction in Animals
The above films may be obtained from Coronet Instructional Film
Chicago, Ill.

The Thread of Life
Obtained through your Telephone Co.
MODULE OF INSTRUCTION
Title - FEEDS AND NUTRITION FOR SMALL ANIMALS

DESCRIPTION:

The student will learn the functions of the different nutrients in the animal diets. In learning the functions of the various nutrients the student will recognize some of the more common symptoms of vitamin and other nutritional deficiencies in small animals. The student will be made aware of the problems encountered in over or underfeeding small animals. In order to prevent these problems the student will learn to set up proper feeding schedules for all the animals in his care. The student will learn to prepare normal and special diets for animals. Since in some cases the animals are fed sterile diets the students will be made aware of the different methods of sterilization used for feeds and the problems of using these methods. Since many types of feed are supplements and not complete diets the students will learn to tell the difference between supplements and whole diets from the labels. The student will learn to make up special diets for newborn small animals and be able to set up feeding schedules and feed these newborn animals properly.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
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</thead>
<tbody>
<tr>
<td>1. Nutrients</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2. Specific Requirements for Different Animals</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3. Preparation of Diets</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>4. Preparation of Pellets</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>5. Preparation of Sterile Diets</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>6. Preparation of Feed for Newborn</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>7. Feeding Animals</td>
<td>0</td>
<td>4</td>
</tr>
</tbody>
</table>

Revised August '75

531
OBJECTIVES to be obtained:

The student will be able to:

1. Recognize some of the symptoms of vitamin deficiencies in small animals.
2. Recognize some of the mineral and other deficiencies in small animals.
3. Learn the basic nutritional requirements for the different species of small animals.
4. Be aware of the problems encountered as a result of over or underfeeding animals.
5. Prepare properly nutritionally balanced diets for the different species of small animals.
6. Distinguish between a complete diet and a supplement from reading the labels on the different animal feeds.
7. Prepare feed for newborn animals.
8. Know the various methods of sterilizing animal feeds and the advantages and disadvantages of each method.
9. Set up proper feeding schedules for newborn small animals.
10. Set up feeding schedules for all the different types of small animals used in the instructional program.
## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 1 - Nutrients</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1</td>
<td>A. Water</td>
</tr>
<tr>
<td>Recognize some of the symptoms of vitamin deficiencies in small animals</td>
<td>B. Proteins</td>
</tr>
<tr>
<td></td>
<td>C. Carbohydrates</td>
</tr>
<tr>
<td></td>
<td>D. Fats</td>
</tr>
<tr>
<td></td>
<td>E. Minerals</td>
</tr>
<tr>
<td></td>
<td>F. Vitamins</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 2 - Specific Requirements for Different Animals</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 2</td>
<td>A. Deficiency Symptoms</td>
</tr>
<tr>
<td>Recognize some of the mineral and other deficiencies in small animals</td>
<td>. External symptoms</td>
</tr>
<tr>
<td></td>
<td>. Internal</td>
</tr>
<tr>
<td></td>
<td>. Unthrifty animals</td>
</tr>
<tr>
<td></td>
<td>B. Improper nutrient balance and diet</td>
</tr>
<tr>
<td></td>
<td>. Fat content</td>
</tr>
<tr>
<td></td>
<td>. Minerals</td>
</tr>
<tr>
<td></td>
<td>. Vitamins</td>
</tr>
<tr>
<td></td>
<td>. Proteins</td>
</tr>
<tr>
<td></td>
<td>. Carbohydrates</td>
</tr>
</tbody>
</table>

<p>| Objective 3 | A. Major nutrients |
| Learn the basic nutritional requirements for the different species of small animals | B. Minor nutrients |
|                     | . Trace minerals |
|                     | C. Lipid needs |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised Study</td>
<td>A. Laboratory exercises</td>
<td>A. Written examination</td>
</tr>
<tr>
<td>B. Slides and movies</td>
<td>B. Laboratory exercises</td>
<td>B. Laboratory exercises</td>
</tr>
<tr>
<td>C. Demonstrations</td>
<td>C. Field trips</td>
<td>C. Notebook grade</td>
</tr>
<tr>
<td>D. Laboratory exercises on animal diets, deficiencies and balanced rations</td>
<td>E. Stress the importance of water, proteins, carbohydrates, fats, minerals and vitamin needs of small animals</td>
<td></td>
</tr>
<tr>
<td>A. Supervised Study</td>
<td>A. Laboratory exercises involving deficient and overdose diets showing effects of vitamin, mineral, protein, fat, carbohydrate and water deficiencies</td>
<td>A. Laboratory exercise test</td>
</tr>
<tr>
<td>B. Films</td>
<td>B. Written test on total content</td>
<td>B. Laboratory test</td>
</tr>
<tr>
<td>C. Slides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Laboratory exercises</td>
<td></td>
<td>C. Notebook grade</td>
</tr>
<tr>
<td>E. Field trips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Class, laboratory and movie notes</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Laboratory exercises</td>
<td>B. Laboratory exercises</td>
<td></td>
</tr>
<tr>
<td>C. Movies--Filmstrips</td>
<td></td>
<td>B. Laboratory test</td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
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<td></td>
</tr>
</tbody>
</table>
| Objective 4       | A. Overfeeding animals  
|                   |   . Excess weight  
|                   |   . Breeding problems  
|                   |   . Economics  
|                   | B. Underfeeding  
|                   |   . Deficiencies  
|                   |   . reproduction  
|                   |   . less resistance to diseases  |
| Objective 5       | Unit 3 - Preparation of Diets  
|                   | A. Routine Diets  
|                   | B. Special Diets  
|                   |   . Deficiency diets  
|                   |   . by deficiency  
|                   |   . by blockage  
|                   | C. Antibiotics, hormones and other growth stimulants  |
| Objective 6       | A. Complete diet  
<p>|                   | B. Supplements  |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Notes on supervised study, class discussion, demonstrations and movies</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Teacher--class discussion</td>
<td></td>
<td>B. Notebook</td>
</tr>
<tr>
<td>C. Demonstrations</td>
<td></td>
<td>C. Credit for students work experience programs</td>
</tr>
<tr>
<td>D. Movies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Laboratory exercises</td>
<td></td>
<td>A. Written examination</td>
</tr>
<tr>
<td>C. Demonstrations</td>
<td>A. Read and analyze feed tags of commercially prepared small animal feeds</td>
<td>B. Laboratory exercises</td>
</tr>
<tr>
<td>D. Movies</td>
<td>C. Oral quiz</td>
<td></td>
</tr>
<tr>
<td>E. Filmstrips</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Teacher--class discussion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Laboratory exercises</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Field trip</td>
<td>A. Students can acquire feed tags from small animal feed dealers</td>
<td>A. Laboratory exercises</td>
</tr>
<tr>
<td></td>
<td>B. Write to companies that formulate commercial small animal feeds</td>
<td>B. Oral quiz</td>
</tr>
</tbody>
</table>

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## OBJECTIVES BY UNIT

### Unit 4 - Preparation of Pellets
- **Objective 7** Prepare feed for newborn animals
  - A. Mice and rats
  - B. Guinea pigs
  - C. Rabbits
  - D. Cats and dogs
  - E. Hamsters
    - Ground feeds
    - Pellets
    - Liquids

### Unit 5 - Preparation of Sterile Diets
- **Objective 8** Know the various methods of sterilizing animal feeds and the advantages and disadvantages of each method
  - A. Basic ingredients
  - B. Problems of sterilization
    - Methods of sterilization
    - Supplements
  - C. Quality control methods relating to feeds
    - Laboratory determination
      - Nutritional
      - Microbiological

### Unit 6 - Preparation of Feeds for Newborn
- **Objective 9** Set up proper feeding schedules for newborn small animals
  - A. Mice and rats
  - B. Guinea pigs
  - C. Rabbits
  - D. Cats
  - E. Dogs
  - F. Hamsters
  - G. Avian species
  - H. Others
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Notes on supervised study, demonstrations and laboratory exercises</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Teacher-student class discussion</td>
<td></td>
<td>B. Laboratory exercises</td>
</tr>
<tr>
<td>C. Demonstrations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Laboratory exercises</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Supervised study</th>
<th>A. Notes on supervised study, demonstrations and laboratory exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Demonstrations</td>
<td></td>
</tr>
<tr>
<td>C. Laboratory exercises</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Demonstrations</th>
<th>A. Laboratory demonstrations and supervised study notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Laboratory exercises</td>
<td></td>
</tr>
<tr>
<td>C. Supervised study</td>
<td></td>
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<tr>
<td>. Feeding schedules</td>
<td></td>
</tr>
<tr>
<td>. Feed preparation</td>
<td></td>
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</table>

| | A. Performance test |
| | B. Laboratory exercise test |

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9
# Objectives by Unit

<table>
<thead>
<tr>
<th>Unit 7 - Feeding Animals</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 10</td>
<td>A. Schedules</td>
</tr>
<tr>
<td></td>
<td>. Fish</td>
</tr>
<tr>
<td></td>
<td>. Reptiles</td>
</tr>
<tr>
<td></td>
<td>. Amphibians</td>
</tr>
<tr>
<td></td>
<td>. Birds</td>
</tr>
<tr>
<td></td>
<td>. Mammals</td>
</tr>
<tr>
<td></td>
<td>B. Reasons for schedules</td>
</tr>
<tr>
<td></td>
<td>. Advantages of feeding on schedule</td>
</tr>
<tr>
<td></td>
<td>. Disadvantages of feeding off schedule</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Set up proper feeding schedules for specific animals</td>
</tr>
<tr>
<td>B. Field trips to zoos and animal farms</td>
<td>B. Supervised study, field trip and laboratory demonstration notes</td>
</tr>
<tr>
<td>C. Laboratory demonstrations</td>
<td></td>
</tr>
</tbody>
</table>

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11
Title - FEEDS AND NUTRITION FOR SMALL ANIMALS  

Code - 01.01010705-03

RESOURCE MATERIALS

A. Books -
2. Manual for Laboratory Care - Ralston Purina Company, St. Louis, Missouri
4. Animal Nutrition - C.


C. Standards for the Breeding and Management of Laboratory Rats, Mice, Rabbits, Cats, Hamsters, and Laboratory Dogs - Institute of Laboratory Animal Resources Material Research Council, National Academy of Sciences, National Academy of Engineering, 2101 Constitution Ave., N.W., Washington, D. C. 20418

D. Audiovisual Aids
Films
- Alimentary Tract
- Digestion of Food
- The Digestive System
- Foods and Nutrition

The above films may be obtained from Encyclopedia Britannica Education Corporation, Chicago.
D. Audiovisual Aids Cont:

Films
The Avitaminoses  2x2 color slides
Maryland Society for Medical Research
Baltimore, Maryland

Digestion (Parts 1 & 2)
University of California
Berkeley, California

Feeding for Health
Friskies Pet Digest
Los Angeles, California

Vitamins and Some Seficiency Diseases
Lederle Laboratories, American Cyanamid Co.
Pearl River, New York

Vitamins and Your Health
Eli Lilly and Co.
Indianapolis, Indiana
MODULE OF INSTRUCTION

Title: REPAIR OF EQUIPMENT

The student will learn to repair animal cages. In the case of wire cages, the student will learn to bend wires and where needed spot weld new wires in replacement of old. With the solid metal cages or metal trays the student will learn to cut and bend the sheets of metal and spot weld sides together. Emphasis will be placed on keeping sharp edges from contact with animals. The student will also learn to repair fish tanks by either replacing glass sides or cases of leaks simple repairs of joints. The student will learn to check pump motors and replace belts and brushes where needed. With heaters used in fish tanks and as hair dryers the students will learn to check and repair defective parts. Since many of the restraining devices used with animals are made of leather, the students will learn to sew or rivet leather goods. The students will also learn to devise and install special animal equipment such as automatic watering devices, metabolism and exercise cages and various types of mazes.

This training should enable the student to repair and replace broken equipment in various types of animal quarters such as laboratories, pet stores and other areas where animals are used or sold.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
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<td>7</td>
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<tr>
<td>Other</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>1. Repair of Cages</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>2. Repair of Air and Water Pumps</td>
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<td>4</td>
</tr>
<tr>
<td>3. Repair of Heaters</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>4. Repair of Leather Goods</td>
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<tr>
<td>5. Development and Repair of Special Equipment</td>
<td>0</td>
<td>30</td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - Repair of Equipment

OBJECTIVES to be obtained:

The student will be able to:

1. Repair wire or metal cages.
2. Spot weld wires or metal joints together.
3. Make repairs on plastic cages.
4. Glass sides on fish tanks.
5. Stop leaks in fish tanks.
6. Check air and water pumps and replace belts and brushes where needed.
7. Check fish tank heater and replace parts where needed.
8. Check hair dryers and replace heating elements, wires and fix blowers where needed.
9. Sew leather goods and make various restraining and other devices of leather used on animals.
10. Install and repair automatic watering devices and other special (simple) equipment used with animals such as mazes, metabolism and exercise cages.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Repair of Cages</strong></td>
<td><strong>A. Wire replacement</strong></td>
</tr>
<tr>
<td><strong>Objective 1</strong></td>
<td>- Bending wire</td>
</tr>
<tr>
<td>Repair wire or metal cages.</td>
<td>- Spot welding</td>
</tr>
<tr>
<td><strong>Objective 2</strong></td>
<td><strong>B. Metal Cages</strong></td>
</tr>
<tr>
<td>Spot weld wire or metal joints.</td>
<td>- Bending metal sheets</td>
</tr>
<tr>
<td><strong>Objective 3</strong></td>
<td>- Cutting sheet metal</td>
</tr>
<tr>
<td>Make repairs of plastic cages</td>
<td><strong>C. Plastic cages</strong></td>
</tr>
<tr>
<td><strong>Objective 4</strong></td>
<td>- Types of plastic cages</td>
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<tr>
<td>Replace glass sides on fish tanks</td>
<td>- Repair of plastic cages</td>
</tr>
<tr>
<td><strong>Objective 5</strong></td>
<td><strong>D. Glass tanks</strong></td>
</tr>
<tr>
<td>Stop leaks in fish tanks.</td>
<td>- Replacing glass in tanks</td>
</tr>
<tr>
<td></td>
<td>- Stopping water leaks in tanks</td>
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<tr>
<td><strong>Unit 2 - Repair of Air and Water Pumps</strong></td>
<td><strong>A. Checking pumps</strong></td>
</tr>
<tr>
<td><strong>Objective 6</strong></td>
<td>- Vibrator</td>
</tr>
<tr>
<td>Check air and water pumps and replace belts and brushes where needed.</td>
<td>- Piston</td>
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<tr>
<td></td>
<td>- replacing belts</td>
</tr>
<tr>
<td></td>
<td>- replacing motor brushes</td>
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<td></td>
<td>- checking motors</td>
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</tbody>
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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Each one of the skills in this unit will be demon-</td>
<td>A. Each student will be given sections of wire of the same gauge as</td>
<td>A. Each student's work will be evaluated individually. The evaluation will be in</td>
</tr>
<tr>
<td>strated by the instructor to indicate the proper and</td>
<td>the animal cages are built of. Using the proper tools the student</td>
<td>relationship to the product demonstrated by the instructor or resource person.</td>
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<tr>
<td>most efficient method of repair.</td>
<td>will bend and spot weld these wires.</td>
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<tr>
<td>B. Teacher must emphasize such things as the proper</td>
<td>B. Sheet metal strips of the same gauge used in animal cages will</td>
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<tr>
<td>tools needed for each equipment repair and the safety</td>
<td>be bent, cut and joined.</td>
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<tr>
<td>precautions that must be observed while making the</td>
<td>C. Plastic strips will be glued together using strips similar to</td>
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<tr>
<td>repairs.</td>
<td>plastics used in cages.</td>
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<tr>
<td>C. A field trip to a shop that repairs small equipment</td>
<td>D. Glass will be cut of the proper dimensions to fit in the sides</td>
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<td>would be good if such a place is available. In some</td>
<td>and bottom of a tank frame. The proper waterproof substances will</td>
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<tr>
<td>cases there may be a resource person available to help</td>
<td>be used.</td>
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<tr>
<td>teach certain techniques concerning repair.</td>
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<tr>
<td>A. The instructor or resource person will disassemble pumps of various makes to point out the various parts and how to spot defects and make repairs necessary to get the pump in working order.</td>
<td>A. Each student will disassemble and reassemble a pump and check a motor for the renewal of brushes and belts.</td>
<td>A. The students performance in disassembly and assembly of pumps and motors will be his evaluation.</td>
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<tr>
<td>B. Motors will be checked to indicate how brushes and</td>
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<tr>
<td>UNIT</td>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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</table>
| Unit 3 - Repair of Heaters | Objective 7 Check fish tank heater and replace parts where needed. | A. Fish tank heaters  
   - Adjusting thermostats  
   - Replacing parts  
   - Fixing and replacing wires on fish tank lights  

B. Hair dryers  
   - Checking wires  
   - Replacing heating elements  
   - Checking and fixing fans and blowers |
|                      | Objective 8 Check hair dryers and replace elements, wires, and fix blowers where needed. |                                                             |
| Unit 4 - Repair of Leather Goods | Objective 9 Sew leather goods and make various restraining and other devices of leather used on animals. | A. Sewing leather  
B. Riveting leather  
C. Embedding hooks and swivels in leather  
D. Making leather holders, muzzles and other restraints. |
### TEACHING METHODS

A. The teacher will demonstrate the repair and adjusting of tank heaters and hair dryers.

B. Various heaters and dryers of various makes should be "bugged" and given to the student to find the defective part or area and put new parts in their place.

C. Have factory representatives demonstrate their products and how they can be serviced when the need arises.

### STUDENT APPLICATION ACTIVITIES

A. Each student will be expected to keep a notebook on the repairs of equipment. The notebook should include the potential problem area and how they could be remedied.

B. Each student will be given heaters and hair dryers that have been "bugged" for them to troubleshoot, and repair.

A. Teachers will demonstrate the methods of cutting and joining leather.

B. Patterns for various leather equipment will be reviewed with students. It would be a good idea to have one completed leather item to examine for each pattern.

C. Review how various patterns will need to be altered for various size animals.

D. Review methods of cleaning leather and keeping it soft.

### EVALUATION PROCEDURES

A. The student will be given pieces of leather to be used for practice.
   - Cutting
   - Joining
   - Glue
   - Rivets
   - Stitching with thread
   - Stitching with leather

B. Each student will make one leather product which could be used with small animals according to a pattern given him by his instructor or approved by the instructor.

A. The student notebook will be graded as to the proper points which may need repair and how to repair them.

B. The student will be evaluated on his ability to troubleshoot a "bugged" piece of equipment and repair the equipment to working order.

A. Each of the various methods of cutting and joining leather will be evaluated as the student completes them.

B. The leather item produced by the student will be graded as to how close it is to the pattern design as well as the workmanship.
## OBJECTIVES BY UNIT

**Unit 5 - Development and Repair of Special Equipment**

**Objective 10**
Install and repair automatic watering devices and other special (simple) equipment used with animals such as mazes, metabolism and exercise cages.

<table>
<thead>
<tr>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td><strong>A. Automatic watering devices</strong></td>
</tr>
<tr>
<td>* Installation of watering devices</td>
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<tr>
<td>* Repair of leaks and plugged devices</td>
</tr>
<tr>
<td><strong>B. Metabolism cages</strong></td>
</tr>
<tr>
<td>* Small rodent type</td>
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<tr>
<td>* Cat or dog type</td>
</tr>
<tr>
<td><strong>C. Exercising cages</strong></td>
</tr>
<tr>
<td>* Rodent</td>
</tr>
<tr>
<td>* Cat or dog</td>
</tr>
<tr>
<td>* Primate</td>
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<tr>
<td><strong>D. Mazes and physiological testing equipment</strong></td>
</tr>
<tr>
<td>* Mazes, types and construction</td>
</tr>
<tr>
<td>* Skinner boxes</td>
</tr>
<tr>
<td>* Flash color or card boxes</td>
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<tr>
<td>* Special problem boxes</td>
</tr>
<tr>
<td>* Bell systems</td>
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<tr>
<td>* Other equipment</td>
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</tbody>
</table>

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<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
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<tbody>
<tr>
<td>A. Each segment of this unit will be demonstrated by the instructor. The automatic watering devices will be set up and the possible trouble spots will be pointed out.</td>
<td>A. Each student will be expected to be able to set up a watering system for a particular type of small animal.</td>
<td>A. Each student's notebook will be evaluated as to proper content.</td>
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<tr>
<td>B. Students will be shown how to repair leaks in whatever type of tubing is found on the water systems. Students will need practice in copper and plastic pipe repair.</td>
<td>B. A notebook with the various types of watering devices should be compiled. This notebook should include tips on repairing problems in watering systems for future reference.</td>
<td>B. Each student will be expected to properly set up a watering system for any small animal designated by the instructor or repair an existing watering system.</td>
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<tr>
<td>C. Specialized cages will be brought into class for review. Factory representatives may be contacted to bring in a greater selection of these specialty items. The set up and care of these cages could then be reviewed for the students.</td>
<td>C. Students should keep notes on the various types of cages as they are demonstrated by the instructor or factory representative so they will know the following. <em>Use of various cages and equipment</em> <em>Set up</em> <em>Maintenance</em></td>
<td></td>
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<td>D. Specialty catalogs can be obtained from companies making these products for student review.</td>
<td></td>
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</tbody>
</table>
RESOURCE MATERIALS

A. Books-

I.A.T. Manual of Laboratory Animal Practice and Techniques
Short and Woodnott
Charles Thomas Pub.
Springfield, Ill.

UFAW Handbook on Care and Management of Animals
UFAW Staff
London, England
MODULE OF INSTRUCTION

Title - CARE AND GROWING OF INSECTS

DESCRIPTION:

The student will learn to identify the different types of insects. He will also learn to raise and grow different types of insects such as ants and bees as well as several different species of beetles. Others would include grasshoppers, katydids, crickets, moths and butterflies, as well as mantis and walking sticks.

This will enable the student to have a constant supply of insects for feeding his insect eating animals. At the same time the student will be introduced to biological control and the role of insects in conservation and his environment.

Emphasis will be placed on growing insects which can be used as safe biological controls of other insects or routinely used as food for other animals.

MAJOR DIVISIONS OR UNITS OF CONTENT

| 1. Establishing an Ant Colony | 6 |
| 2. Growing Beetles in Captivity | 6 |
| 3. Growing Grasshoppers and Crickets | 4 |
| 4. Growing Mantis and Walking Sticks | 3 |
| 5. Raising Butterflies and Moths | 4 |
| 6. Bee Keeping | 6 |
| 7. Uses of Insects | 1 |

Revised August 1975
MODULE OF INSTRUCTION

TITe: CARE AND GROWING OF INSECTS

Objectives to be obtained:

The student will be able to:

1. Set up and maintain an ant colony.
2. Distinguish a queen ant from the rest of the ants in a colony.
3. Raise lady-bird beetles in captivity.
4. Raise grain and other common beetles in captivity.
5. Recognize the different stages of beetles, such as the egg, larvae, pupae and adult.
6. Raise grasshoppers, katydids and crickets in captivity.
7. Raise mantis and walking sticks in captivity.
8. Distinguish the differences between moths and butterflies.
9. Raise moths and butterflies in captivity.
10. Identify the different types of bees.
11. Set up a beehive.
12. Assess the natural benefit and use of some of the insects while still being able to recognize those insects which are harmful.
# CARE AND GROWING OF INSECTS

## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 1 - Establishing an Ant Colony</th>
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</thead>
<tbody>
<tr>
<td><strong>Objective 1</strong></td>
</tr>
<tr>
<td>Set up and maintain an ant colony</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 2 - Growing Beetles in Captivity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 3</strong></td>
</tr>
<tr>
<td>Raise lady-bird beetles in captivity</td>
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</tbody>
</table>

<table>
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<tr>
<th>Objective 4</th>
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</thead>
<tbody>
<tr>
<td>Raise grain and other common beetles in captivity</td>
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</tbody>
</table>

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<tr>
<th>Objective 5</th>
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</thead>
<tbody>
<tr>
<td>Recognize the different stages of beetles, such as egg larvae, pupa and adult.</td>
</tr>
</tbody>
</table>

## CONTENT

### A. Types of cages or quarters for ants
- Visual study cases
- Migration boxes

### B. Obtaining colonies
- General colonies
  - queen ants
  - complete colonies

### C. Feeding and watering ants

### D. Problems in raising ants in captivity

### A. Lady-bird beetles

### B. Grain beetles (mealworms and others)

### C. Other beetles easily grown in captivity
**TEACHING METHODS**

<table>
<thead>
<tr>
<th>A. Review the following points with the class</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Different types of ants</td>
</tr>
<tr>
<td>- How to distinguish the queen ant</td>
</tr>
<tr>
<td>- Feeding of the colony</td>
</tr>
<tr>
<td>- Setting up a study case</td>
</tr>
<tr>
<td>- Materials</td>
</tr>
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<td>- Soil</td>
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<tr>
<td>- Moisture</td>
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<table>
<thead>
<tr>
<th>B. Set up a small study case</th>
</tr>
</thead>
<tbody>
<tr>
<td>a demonstration</td>
</tr>
<tr>
<td>- Put ants in the case and it has been set up</td>
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</table>

**STUDENT APPLICATION ACTIVITIES**

| A. Students will put information in notebooks about ants and their case |
| B. Each student will set up a study case and keep it active while doing this module |

**EVALUATION PROCEDURES**

| A. Notebook material will be evaluated |
| B. The individual study cases will be evaluated as to function and design |

**ADDITIONAL APPLICATION ACTIVITIES**

A. Review practical methods of establishing a growing box for lady-bird beetles
   - Review the proper media lady-bird beetles need to grow
   - Temperature
   - Food
   - Moisture

B. Uses of beetles

C. Review life cycles of beetles
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 3 - Growing Grasshoppers and Crickets**<br>Objective 6<br>Raise grasshoppers, katydids and crickets in captivity | **A.** Growing grasshoppers<br>  
  • Types of grasshoppers<br>  
  • Katydids<br>  
  **B.** Crickets<br>  
  **C.** Types of cages and feed<br>  
  **D.** Food for small animals<br>  
  **E.** Review life cycles |
| **Unit 4 - Growing Mantis and Walking Sticks**<br>Objective 7<br>Raising mantis and walking sticks in captivity | **A.** Obtaining and caring for egg cases<br>  
  **B.** Hatching and raising young<br>  
  • Cannibalism<br>  
  • Feeding and watering<br>  
  • Housing and preventing escaping<br>  
  • Adults |
| **Unit 5 - Raising Butterflies and Moths**<br>Objective 8<br>Distinguish the differences between moths and butterflies<br>Objective 9<br>Raise moths and butterflies in captivity | **A.** Butterflies<br>  
  • Raising larvae<br>  
  • Storing cocoons<br>  
  • Adult butterflies<br>  
  **B.** Moths<br>  
  • Hatching cocoons<br>  
  • Mating adults<br>  
  • Collecting eggs<br>  
  • Raising larvae |
<table>
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<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
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</thead>
<tbody>
<tr>
<td>A. Review methods of identifying grasshoppers, katydids and crickets</td>
<td>A. Information in notebook on raising grasshoppers, katydids and crickets</td>
<td>A. Notebook evaluation</td>
</tr>
<tr>
<td>B. Collect these insects during summer with sweep nets and baited traps</td>
<td>B. Construct a cage to hold these insects and collect insects to start your own collection</td>
<td>B. Oral evaluation on the process of raising these insects for laboratory use including the life cycles, food, housing needs and problems in raising</td>
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<td>C. Visit labs that raise these insects for food</td>
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<td>D. Construct a cage from fine mesh wire to house insects as a demonstration and then allow them to build their own holding cage</td>
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<tr>
<td>A. Review the identifying characteristics of butterflies and moths and the differences between them. This can be done by the use of charts, movies, slides or mounted samples of each</td>
<td>A. Place information in notebook which is presented by instructor or resource person on:</td>
<td>A. Notebook evaluation</td>
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<tr>
<td></td>
<td>. Differences between butterflies and moths</td>
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<td>. How to raise</td>
<td>B. Orally tell the main differences between butterflies and moths. Tell how each is most successfully raised and review the life cycles of each</td>
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<tr>
<td></td>
<td>. Where and how to collect</td>
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<td>. Storage of cocoons</td>
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<td>. Food</td>
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<td>B. Collect specimens with traps, lights and sweep nets</td>
<td>B. Collect specimens with traps, lights and sweep nets</td>
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<td>C. Make a mount board of both butterflies and moths</td>
<td>C. Make a mount board of both butterflies and moths</td>
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</table>
# CARE AND GROWING OF INSECTS

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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</thead>
</table>
| **Unit 6 - Bee Keeping**  
Objective 10  
Identify the different types of bees | A. Types of bees  
B. Types of hives  
C. Maintaining beehives  
  - Equipment  
  - Methods  
  - Problems  
    - diseases  
    - bee enemies  
  - Recovering honey  
    - methods of keeping bees from getting excited during collection of honey and working with supers |
| **Unit 7 - Uses of Insects**  
Objective 12  
Recite the natural benefit and use of some of the insects while still being able to recognize those insects which are harmful | A. Feed for other animals  
  - Other insects  
  - Fish and birds  
  - Mammals and reptiles  
B. Ecology and conservation  
  - For teaching  
    - Aerating soil  
    - Recycling of waste materials  
  - Harmful insects  
    - Destroy crops  
    - Bite or sting |
RESOURCE MATERIALS

A. Books -
   Raising Laboratory Animals
   James Silvan
   American Museum of Natural History
   New York, New York.

   Experimental Entomology
   Kenneth W. Cummins, et al
   Reinhold Publishing Co
   New York, New York

   Rearing Insects in Schools
   R.E. Siverly
   Wm. C. Brown Co.
   Dubuque, Iowa

B. Bulletins -
Title - FEEDS AND FEEDING

Code - 01.01012-01

DESCRIPTION:

In this module students will develop skills needed to determine animal nutritional needs, calculate nutritional values of feeds, select animal feeds, and follow recommended practices in feeding livestock.

Students will be given the opportunity to develop a feeding program for either beef, dairy, horses, poultry, sheep, or swine.

<table>
<thead>
<tr>
<th>MAJOR DIVISIONS OR UNITS OF CONTENT</th>
<th>Time Allocations</th>
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<tbody>
<tr>
<td></td>
<td>Class</td>
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<tr>
<td>1. Digestive Tract</td>
<td>1</td>
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<tr>
<td>2. Meeting Nutritional Needs of Livestock</td>
<td>2</td>
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<tr>
<td>3. Selecting Feeds to use for Livestock</td>
<td>1</td>
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<tr>
<td>4. Determining Livestock Feeding Practices</td>
<td>1</td>
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<tr>
<td>5. Balancing a Ration</td>
<td>2/7</td>
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</table>

Revised June, '74
MODULE OF INSTRUCTION

Title - FEEDS AND FEEDING

Objectives to be obtained:

The student will be able to:

1. List the parts of the digestive tract and the contribution of each part to the digestive process for various species of livestock.

2. Correctly determine the nutritional needs of livestock, using references containing the necessary information.

3. Correctly calculate the nutritional value of a given feed, using references containing the necessary information.

4. Correctly determine how much of a given feed or feeds is required to meet livestock nutritional needs, using references containing the necessary information.

5. Choose, to the instructor's satisfaction, feeds to use for a given class of livestock.

6. Determine, to the instructor's satisfaction, five practices to follow in feeding a given class of livestock.

7. Prepare, to the instructor's satisfaction, a plan for feeding one class of livestock on a given farm.

8. Determine how to balance rations that will provide nutrients required for various species of livestock.

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<table>
<thead>
<tr>
<th>UNIT</th>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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</thead>
</table>
| Unit 1 - Digestive Tract | Objective 1 | A. Ruminants  
  - Dairy Cattle  
  - Beef Cattle  
  - Sheep  
  B. Simple Stomach  
  - Horse  
  - Swine  
  C. Poultry |
| | List the parts of the digestive tract and the contribution of each part to the digestive process for the various species of livestock. |
| Unit 2 - Meeting nutritional needs of livestock | Objective 2 | A. Determining needs of livestock  
  - Maintenance  
  - Production  
  - Reproduction  
  - Growth  
  B. Nutrients to consider in meeting livestock needs  
  - Energy  
  - carbohydrates  
  - fats and oils  
  - protein  
  - Protein  
  - Vitamins  
  - Minerals  
  - Water  
  C. Calculating nutritional needs  
  - Net energy, estimated net energy, total digestible nutrient measurements  
  - Determining energy, protein, vitamins and mineral needs. |
<p>| | Correctly determine the nutritional needs of livestock, using references containing the necessary information. |</p>
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<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
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</table>
| A. Supervised study | A. From mimeos of Digestive Tracts student will label parts of Ruminants and Single Stomach Animals and list the functions of all parts of the digestive tract. | A. Written Test  
. Label the parts of the digestive tracts.  
. Match-up on functions of digestive tract. |
| B. Film - "The Rumen Story" Cornell Film Library | | |
| C. Overhead projector using appropriate overlays for all types of livestock. | | |
| A. Glass discussion problem solving calculating nutritional needs. | A. Take notes during lecture discussion.  
B. Read appropriate sections in resource material.  
C. Students will solve animal nutrition requirements using teacher prepared problems or actual situations. | A. Written test  
. Solving animal nutrient requirement problems. |
| B. Supervised study  
. Identify the nutrients that require the most attention. | | |
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<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td><strong>Objective 3</strong></td>
<td>Correctly calculate the nutritional value of a given feed, using references containing the necessary information.</td>
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<td>A. Types of feeds -</td>
<td>Concentrates</td>
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<tr>
<td>* Roughages</td>
<td>* Corn</td>
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<td>* Hay</td>
<td>* Oats</td>
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<td>* Alfalfa</td>
<td>* Wheat</td>
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<td>* Trefoil</td>
<td>* Buckwheat</td>
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<td>* Clover</td>
<td>* Rye</td>
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<td>* Timothy</td>
<td>* Barley</td>
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<td>* Bromegrass</td>
<td>* Cereal grain by-products</td>
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<td>* Sudan grass</td>
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<td>Silage</td>
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<td>* Corn Silage</td>
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<td>* Haylage</td>
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<td>* Sorghum</td>
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<td><strong>Objective 4</strong></td>
<td>Correctly determine how much of a given feed or feeds is required to meet livestock nutritional needs, using references containing the necessary information.</td>
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<tr>
<td>A. Determining proportion of concentrate and roughage to feed -</td>
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<tr>
<td>* Recommended practices</td>
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<td>* Individual situations</td>
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<td>* Using Pearson's square</td>
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<td>B. Meeting the animals energy needs</td>
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<td>C. Meeting the animals protein needs</td>
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<td>D. Meeting the animals vitamins and mineral needs</td>
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<td>E. Meeting the animals water needs</td>
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<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
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<tr>
<td>A. Lecture - discussion to teach basic information</td>
<td>A. Take notes on information presented.</td>
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<td>B. Chart the values of each roughage and grain for D.P. T.D.N., and cost.</td>
<td>B. Study related information in available resource material.</td>
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<td>C. Identify each cereal grain and grain by-product - obtain from local feed dealer.</td>
<td>C. Observe and take part in demonstrations and identifications.</td>
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<td>D. Demonstration</td>
<td>D. Work out given problems calculating the nutritional values of different feeds.</td>
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<td>- Obtain forage analysis from tested feeds to compare visual observations with chemical analysis.</td>
<td>E. Analyze tags from dairy, poultry, horse, swine and beef feeds.</td>
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<td>- Burn feeds to show their energy and the ash (minerals left).</td>
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<td>- Calculate nutritional values of feeds.</td>
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<td>- Test moisture in feeds to determine % of dry matter.</td>
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<td>E. Class problem solving.</td>
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A. Lecture - discussion to show calculations required. Sample problems will be needed.
B. Field trip to local feed dealer who balances rations for farmers.
C. Individual supervised study
D. Class problem solving

A. Take notes on sample calculations.
B. Students observe methods used by local dealer to balance rations.
C. Students work on given problems or individual feed problems.

A. Written test to determine if students can solve feeding problems.
**OBJECTIVES BY UNIT**

<table>
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<tr>
<th>Unit 3 - Selecting feeds to use for livestock</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td>Objective 5</td>
<td>A. Factors to consider in selecting feed</td>
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<td>- Nutritional content</td>
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<td>- Cost</td>
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<td>- Feed form as affects utilization and handling</td>
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<td>- Availability</td>
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<td>- Palatability</td>
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<td>- Variety</td>
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<td>- Bulk</td>
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<th>Unit 4 - Determining livestock feeding practices to follow</th>
<th>CONTENT</th>
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<tbody>
<tr>
<td>Objective 6</td>
<td>A. Recommended feeding practices</td>
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<tr>
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<td>- Factors to consider</td>
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<td>- Returns</td>
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<td>- Animal Characteristics</td>
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<td>- Effects of feed on man and animals</td>
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<td>- Other</td>
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<tr>
<th>Objective 7</th>
<th>B. Group Feeding</th>
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<tr>
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<td>C. Blender mixing wagons</td>
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<thead>
<tr>
<th>Objective 7</th>
<th>A. Dairy cattle.</th>
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<tr>
<td></td>
<td>B. Beef</td>
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<tr>
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<td>- Description of situation</td>
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<td>- Types of feeds to be used</td>
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<td>- Amounts of each feed needed for one year (calculations shall be included)</td>
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<td>- Estimated costs for one year</td>
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<td>- Recommended practices that will be followed</td>
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<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
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<tbody>
<tr>
<td>A. Lecture - discussion to provide basic information.</td>
<td>A. Take notes on basic information.</td>
<td>A. Evaluate student notes to date.</td>
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</table>
| B. Field trips  
  - Feed dealer  
  - Farmer who mixes his own feed.  
  - To observe feeds fed to different livestock |
| C. Problem solving preferably of an actual problem |
| A. Group discussion to determine factors to consider. | A. Determine factors to consider in selecting feeding practices. |
| B. Field trip(s) to observe practices followed.  
  C. Problem solving method |
| A. Supervised Study |
| R. Individual instruction  
  C. Students make oral reports regarding their plans. |

| | | |
| A. Prepare plan as instructed  
  B. Use animals owned by students, whenever possible. |
| | A. Evaluate students complete plan.  
  B. Oral reports |
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<th>UNIT</th>
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<tr>
<td>4. 8</td>
<td>A. Dairy&lt;br&gt;   - Roughages&lt;br&gt;   - Concentrates</td>
</tr>
<tr>
<td></td>
<td>B. Beef&lt;br&gt;   - Roughages&lt;br&gt;   - Concentrates</td>
</tr>
<tr>
<td></td>
<td>C. Poultry&lt;br&gt;   - Starter Rations&lt;br&gt;   - Growing Rations&lt;br&gt;   - Laying Rations</td>
</tr>
<tr>
<td></td>
<td>D. Swine&lt;br&gt;   - Starter Rations&lt;br&gt;   - Growing Rations&lt;br&gt;   - Fattening Rations</td>
</tr>
</tbody>
</table>

Determine how to balance rations that will provide nutrients required for various species of livestock.
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Apply knowledge to students supervised work experience projects.</td>
<td>A. Field trip report evaluations.</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>B. Class and field trip notes</td>
<td>B. Written test on problems related to specific types of livestock.</td>
</tr>
<tr>
<td>C. Problem solving</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Film strips and visuals related to animals fed balanced rations and results from deficient rations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Field trips</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RESOURCE MATERIALS

A. Books -

Feeds and Feeding, Morrison (abridged edition for students)
Dairy Cattle Feeding and Management, Reaves and Henderson, Wiley
Stockman's Handbook, Ensminger

B. Bulletins -

"Feeding the Dairy Cow for Maximum Returns" - E1156 - Cornell
"Animal Nutrition Handbook" - Ralston Purina
"Early Cut Hay and Silage" - Cornell #E1059
"Sheep Production" - Cornell #E828
"Raising Beef Cattle" - Cornell #1011
"The Mineral and Vitamin Requirements of Livestock" - Cornell #E1149
"Lazing Flock Management" - Cornell #E1061

C. Periodicals -

Dairy News - refer to current feed prices sections
Hoard's Dairymans
Any of the Livestock Magazines

D. Audiovisuals -

Nasco charts - Animal Digestive Systems

E. Handbooks

Dairy Nutrition - Teachers Handbook - IMS (F33)
Dairy Nutrition - Student's Handbook - IMS (F34)
Total Dairy Ration
‘The Whole Thing’
in a Single Dairy Feed

by DR. K. L. DOLGE
Animal Nutritionist
Feed Division

A popular TV commercial says, “I can’t believe I ate the whole thing.” Well he did, and dairy cows do, and if dairymen are going to get the most milk for the least money they have got to consider the “whole thing” also—the total dairy ration.

Agway’s new TDR (Total Dairy Ration) Profile program does just exactly that. The principle is simple. We know how much dry matter we can reasonably expect a cow to consume. We know how much energy, protein, fiber, etc., she needs to maintain her body weight, grow a calf and support specified levels of production. The TDR program simply combines forage and other homegrown feeds with the proper Agway feed to get the nutritional concentration needed. All it requires is a minimum of paperwork and the answer is in a simple, easy and ready-to-use form.

The beauty of TDR is that it is economical and it works. Dairyman Gary Reardon of McGraw, N.Y., reports a 25-35% increase in production. Austin Warner, an Agway applied research specialist working with the Reardon farm, reports nine cows peaked over 100 lbs/day after going on TDR. While that’s exceptional, Dave Hall, a dairymen near Camden, N.Y., increased his herd average 1,100 lbs. by following the TDR recommendations. Glynn O’Hara, the Agway Dairy enterprise salesman who works with Hall, also got John Pabirts, a patron of the Rome, N.Y. store, on TDR. For the first time, cows in the Pabias herd are peaking at 80-90 lbs. and are holding, too.

TDR’s Start

TDR originally started as a program limited to herds where facilities for mixing forage and grain and self-feeding the resulting mixture were available. Studies in Georgia and California, as well as at Agway’s Research Center in Fabius, N.Y., demonstrated that a properly balanced mixture of concentrates and forages could be self-fed. Each cow adjusts intake to meet her individual nutritional requirements. While some dry cows will overconsume and gain excess weight, lactating cows do a good job of adjusting intake to need. The total ration has to be balanced; protein to energy, calcium to phosphorus, and for fiber, bulk and other nutritional factors. When this is done, dry matter can be reliably predicted.

It soon became clear that it really didn’t make that much difference whether the farmer mixed the concentrate and forage before feeding or whether the cow mixed them in the rumen after she ate them. The basic principles were the same. For maximum profitable production, nutrient concentration has to be adjusted to total dry matter intake. Too often in the past, requirements were met on paper but the cow couldn’t, or wouldn’t, eat the amount of forage and concentrate she was allotted. Results were low production and low income. But TDR solves these problems, and may actually lower feed cost, too. For Lawrence Turner and son, Mt. Upton, N.Y., the feed bill is down $600-700 per month since going on TDR. Floyd Tarbell, Dairy Enterprise salesman, reports that in addition to these savings, the Turners’ herd average is up 1,500 lbs.

The program is based on established nutrient requirements and dry matter intake. The dairymen supplies the average body weight of the milking herd, the fat test, the price of milk and selects up to four levels of production. The price and nutritive value of his forage and other homegrown feeds is determined either by forage analysis or date of cutting, and the available Agway feeds are entered.

Actually Two Programs

TDR actually supplies two feeding programs. One, “the farm limited,” is based on the amount of forage the dairymen is feeding or wants to feed. The second, “the optimum formula,” adjusts forage and grain intake to get the nutrient concentration necessary to meet the nutritional requirements within the expected dry matter intake.

A big advantage is that the program prints out the income-over-feed cost for each of the feeding programs. The member can compare either his current forage program, or one he would like to use, to the optimum formula. He can easily see what changes in forage programs will do to the all-important income-over-feed cost figure. This could also be used as a sound basis for decisions on future forage programs. If forage is limited, the program will show how to use it most profitably and whether one should buy hay, or should simply feed more grain.

TDR is versatile. Whether you feed cows in the stanchion, the parlor, or in a bunk; whether you feed grain and forage separately or mixed, TDR can help make more milk for greater income. Edward Henderson of Whitney Point, N.Y., thoroughly agrees. His 115-cow herd, now on TDR, is averaging 48 lbs/day, higher than ever before. Some of his cows are peaking over 95 lbs/day. All are testing exceptionally well and have good persistency.

Like the television commercial, the dairy cow eats the whole thing, so when we feed her, we have to consider that whole thing—the total dairy ration. TDR does that job.
Title: PLANNING A BREEDING PROGRAM (LIVESTOCK)  
Code: 01.010301

DESCRIPTION:

Students will develop knowledge and skills required to carry out a successful livestock breeding program. Emphasis will be on the selection and mating of animals to produce a profit. Students will learn how to identify breeding problems and symptoms related to reproductive diseases. The importance of records will be discussed. Students will learn how to keep and use breeding charts.

Artificial insemination of animals will be covered in Dairy Cattle Breeding Module.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Basics of livestock genetics</td>
<td>4</td>
</tr>
<tr>
<td>2. Basics of livestock reproduction</td>
<td>4</td>
</tr>
<tr>
<td>3. Livestock reproduction practices</td>
<td>2</td>
</tr>
<tr>
<td>4. Planning a breeding program</td>
<td>1</td>
</tr>
</tbody>
</table>

Revised June, 1974

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MODULE OF INSTRUCTION

Title - PLANNING A BREEDING PROGRAM

OBJECTIVES to be obtained:

The student will be able to:

1. Demonstrate knowledge of basic livestock genetics by describing the inheritance of production and other inherited characteristics.

2. Correctly diagram the parts of a male and female reproductive system and list a major function for each part, without the use of references.

3. Correctly determine, by visual means, when an animal is experiencing her heat period.

4. Correctly determine, in a given situation, the time an animal should be bred during the heat period.

5. Correctly recognize the symptoms for five reproductive malfunctions or diseases and list two effective measures that may be taken to prevent each problem.

6. Correctly list five examples of acceptable breeding practices for three different classes of livestock.

7. Demonstrate ability to correctly record information on a reproduction record and use this information to make breeding decisions.

8. Given a situation, correctly select one of three breeding animals from a group of ten.

9. Given a situation, select and justify mates for animals to be bred.

10. Develop a planned breeding program for one class of livestock on a given farm which meets the instructor's approval.
<table>
<thead>
<tr>
<th>Objectives by Unit</th>
<th>Content</th>
</tr>
</thead>
</table>
| **Unit 1 - Basics of Livestock Genetics**  
Objective 1  
Demonstrate knowledge of basic livestock genetics by describing the inheritance of production and other inherited characteristics. | **A. Basic Genetics**  
- Laws of inheritance  
- Sex determination  
- Sex-linked characteristics  
- Dominant & recessive characteristics  
- Undesirable recessives  
- Lethal genes  
- Mutations  
**B. Other Inherited Characteristics**  
- Production  
- Type |
| **Unit 2 - Basics of Livestock Reproduction**  
Objective 2  
Correctly diagram the parts of a male and female reproductive system and list a major function for each part, without the use of references.  
Objective 3  
Correctly determine by visual means when an animal is experiencing her heat period. | **A. Parts and Functions of Male Reproductive Organs**  
Note difference between animals  
- Beef  
- Dairy  
- Sheep  
- Horses  
- Swine  
**B. Parts and Functions of Female Reproductive Organs**  
- Dairy  
- Beef  
- Sheep  
- Horses  
- Swine  
**C. Physiology of Conception**  
**D. Hormone Action as Related to the Reproductive Tract**  
**E. Causes of Twinning** |

**571**
## Planning a Breeding Program

<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class lecture</td>
<td>A. Students take notes on lecture, supervised study, class discussion and field trip information.</td>
<td>A. Written test on basic genetics</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Identify herds in the area that will be classified: Observe a classifier at work Discuss the benefits of having herds classified with students and cooperative farmers.</td>
<td>B. Notebook grade</td>
</tr>
<tr>
<td>C. Class discussion</td>
<td></td>
<td>C. Field trip report</td>
</tr>
<tr>
<td>D. Film strips and overlays</td>
<td></td>
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</tr>
<tr>
<td>E. Field trip to a farm that has a classified herd</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Student notes on supervised study. Class discussion, film strips, overlays and films.</td>
<td>A. Written test on reproductive tracts organs and the function of each organ</td>
</tr>
<tr>
<td>B. Classroom discussion</td>
<td>B. Students keep diagrams of male and female reproductive tracts.</td>
<td>B. Notebook grade on supervised study class discussion, visual aid material and veterinarian information.</td>
</tr>
<tr>
<td>C. Film strips and overlays</td>
<td>C. Notes on veterinarian comments Ask veterinarian any questions related to problems on the home farm or cooperative farm involved with supervised work experience programs.</td>
<td></td>
</tr>
<tr>
<td>D. Film on reproduction of farm animals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Veterinarian, resource person invited to discuss reproductive systems with class members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Lecture</td>
<td></td>
<td>A. Performance grade on field trip</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td></td>
<td>B. Written test</td>
</tr>
<tr>
<td>C. Slides</td>
<td></td>
<td>C. Oral test</td>
</tr>
<tr>
<td>D. Assign students a report related to the objective. Arrange for opportunities to have students make observations on field trips, home farm or cooperative farm.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Notes on lecture and supervised study.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Field trip report oral or written</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Apply knowledge learned to home farm or cooperative farm situations related to supervised work experience programs.</td>
<td></td>
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<tr>
<td>D. Discuss the subject with IA inseminators.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 4</strong></td>
<td>Correctly determine, in a given situation, the time an animal should be bred during the heat period.</td>
</tr>
<tr>
<td><strong>Objective 5</strong></td>
<td>Correctly recognize the symptoms for five reproductive malfunctions or diseases and list two effective measures that may be taken to prevent each problem.</td>
</tr>
<tr>
<td><strong>Objective 6</strong></td>
<td>Correctly list five examples of acceptable breeding practices for three different classes of livestock.</td>
</tr>
<tr>
<td><strong>Objective 7</strong></td>
<td>Demonstrate ability to correctly record information on a reproductive record, and use this information to make breeding decisions.</td>
</tr>
</tbody>
</table>

**Unit 3 - Livestock Reproduction Practices**

**Objective 5**
Correctly recognize the symptoms for five reproductive malfunctions or diseases and list two effective measures that may be taken to prevent each problem.

- A. Reproductive Malfunctions
  - Hemaphroditism
  - Freemartins
  - Cryptorchidism
  - Cystic ovaries
  - Retained corpus luteum
  - Enlarged prostate
  - Others
- B. Reproductive diseases
  - Brucellosis
  - Leptospirosis
  - I.B.R.

**Objective 6**
Correctly list five examples of acceptable breeding practices for three different classes of livestock.

- A. Recommend breeding practices
  - Beef
  - Dairy
  - Horses
  - Poultry
  - Sheep
  - Swine

**Objective 7**
Demonstrate ability to correctly record information on a reproductive record, and use this information to make breeding decisions.

- A. Information to record
  - Identification
  - Birth date
  - Parents
  - Sex
  - Heat periods
  - Breeding dates
  - Pregnancy exam
  - Veterinary treatment
  - Date due
  - Special information
- B. How to record information
- C. Using information to make breeding decisions
### Teaching Methods

<table>
<thead>
<tr>
<th></th>
<th>A. Lecture - Discussion - supervised study</th>
<th>B. Resource personnel or tape recordings</th>
<th>C. Local inseminator</th>
<th>D. Veterinarian</th>
<th>E. Students experiences</th>
</tr>
</thead>
</table>
|               | A. Lecture discussion to present facts    | B. Resource personnel to present local situation  
. Insemination technician  
. Farmer  
C. Use tape recordings if possible |                      |                      |                          |
|               | A. Supervised study                      | B. Student reporting field trip to area farm |                      |                      |                          |
|               | A. Lecture discussion to present facts    | B. Supervised study                      | C. Display different forms of breeding charts. |                      |                          |

### Student Application Activities

<table>
<thead>
<tr>
<th></th>
<th>A. Take notes on information</th>
<th>B. Develop charts for selected animals to show recommended breeding times.</th>
<th>C. Use DHIA records and breeding charts to help identify when animals will be in heat</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Students develop list of breeding practices for selected classes of livestock and report to class.</td>
<td>B. Observe practices on farm visit</td>
<td></td>
</tr>
</tbody>
</table>
|               | A. Take notes on information | B. Recognize symptoms of reproductive problems in actual situation.  
. Using home farm  
. Cooperative farms  
. Field trips  
. Travel with an inseminator or veterinarian |                      |
|               | A. Develop or obtain records used in various classes of livestock |                      |                      |
|               | C. Practice filling out records using given information |                      |                      |
|               | D. Make breeding decisions using given information. |                      |                      |

### Evaluation Procedures

<table>
<thead>
<tr>
<th></th>
<th>A. Evaluate charts</th>
<th>B. Written exam</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A. Written test</td>
<td>B. Students ability to recognize symptoms under field conditions</td>
</tr>
<tr>
<td></td>
<td>A. Teacher evaluation of student list of breeding practices.</td>
<td>B. Students write a report on breeding practices for given livestock classes.</td>
</tr>
<tr>
<td></td>
<td>A. Evaluate record forms developed by students</td>
<td>B. Work experience evaluation</td>
</tr>
</tbody>
</table>

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**EDUCATION**

**01.010103-01**

**PLANNING A BREEDING PROGRAM**

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**7**
### PLANNING A BREEDING PROGRAM

#### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective 8</th>
<th>Given a situation, correctly select the top three breeding animals from a group of ten.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Objective 9</th>
<th>Given a situation, select and justify mates for animals to be bred.</th>
</tr>
</thead>
</table>

#### CONTENT

<table>
<thead>
<tr>
<th>A. Factors to consider in selecting breeding stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedigree</td>
</tr>
<tr>
<td>Type</td>
</tr>
<tr>
<td>Production</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Other factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
</tr>
<tr>
<td>Conformation</td>
</tr>
<tr>
<td>Longevity</td>
</tr>
<tr>
<td>Cost</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Mating animals</th>
</tr>
</thead>
</table>
| Laws of inheritance:
| Factors to consider in mating |
| correcting weaknesses
| increasing production |
| size
| color
| conformation
| cost |

<table>
<thead>
<tr>
<th>A. Program to include</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class of livestock</td>
</tr>
<tr>
<td>Current problems</td>
</tr>
<tr>
<td>Program to correct problems</td>
</tr>
<tr>
<td>Time required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Resource people available to assist farmers</th>
</tr>
</thead>
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### TEACHING METHODS

<table>
<thead>
<tr>
<th>A. Supervised study</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Field trips for classes of livestock and live selections.</td>
</tr>
</tbody>
</table>

| A. Lecture - discussion to present facts |
| B. Supervised study |
| C. A. I. Resource person invited to class to discuss breeding selections |

| A. Individual instruction |
| B. Supervised study |
| C. Speaker - a successful breeder of livestock in your area or: |
  - Members from sire selections committees
  - A. I. Field staff
  - A. I. organization field staff
  - Pro-genetics |

### STUDENT APPLICATION ACTIVITIES

| A. Take notes on information |
| B. Evaluate animals from a sale catalog (accompanied by seeing animals if possible) to select male and female breeding stock. |
| C. Group consensus to determine best selection |
| D. Select male breeding stock from artificial insemination company listing. |

| A. Take notes on information |
| B. Practice selecting mates for animals using: |
  - Sale catalogs
  - On farm visits
  - Animals from your supervised farming program |

| A. Prepare breeding programs plan for your own farm, cooperative farm or sample farm. |

### EVALUATION PROCEDURES

| A. Evaluate students ability to select animals in a farm situation using records and animal classes. |
| A. Evaluate students ability to mate animals on a farm visit, or from a catalog. |
| B. Select mates for animals listed in sale catalogs. |

| A. Given a specific farm situation students evaluate plan. |
MODULE OF INSTRUCTION

Title - Planning a Breeding Program

RESOURCE MATERIALS

Books:
1. Livestock Breeding - 194 pages, Ohio available from IMS
2. Anatomy & Physiology of Farm Animals-Frandson-Lea & Febiger
3. Reproduction in Farm Animals-Hafez-Lea & Febiger
6. Artificial Insemination of Farm Animals, Perry-Rutgers Press

Bulletins:
1. Artificial Insemination of Livestock - 8 pgs., Illinois, available from IMS
2. Sterility and Delayed Breeding in Dairy Cattle - Cornell E737
3. Sheep Production - Cornell E828
4. Raising Beef Cattle - Cornell E1011
5. Selection and Evaluation of Dairy Sires, E 1118
6. Horse Health Hints - E 1153
7. N. Y. Swine Improvement Program - E 1206
8. Estimating Transmitting Ability of Sires - Cornell 1217
9. Laying Flock Management - Cornell E 1061
10. Reproduction of Farm Animals (Cornell bulletin out of print)

Periodicals:
1. Artificial Insemination (monthly) - National Assn. of Animal Breeders
2. Breed Assn. Magazines

Audiovisuals:
1. Dairy Cattle Sterility - (45 color slides) available from IMS
2. Genetics & Livestock Breeding Transparencies - Cal. Poly Tech
3. Models, filmstrips, transparencies - NASCO
4. Livestock Breeding Transparencies & Master - 37 transparencies - IMS
MODULE OF INSTRUCTION

Title - MAINTAINING LIVESTOCK HEALTH

DESCRIPTION:

The prevention of animal disease is emphasized in this module. Students will develop skills in recognizing animal stress, maintaining sanitary housing and using health records to prevent disease problems.

Students will be involved in the recognition of symptoms of diseases that are common to production livestock (beef, dairy, horses, sheep, swine). The appropriate action following the diagnosis of a disease requiring veterinary service, quarantine, and emergency treatment are also covered.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
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<tbody>
<tr>
<td>Class</td>
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<td>7</td>
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</tbody>
</table>

Revised January, 1975
MODULE OF INSTRUCTION

Title - MAINTAINING LIVESTOCK HEALTH

OBJECTIVES to be obtained:

The student will be able to:

1. Define a disease.

2. Select and use references on animal diseases.

3. Demonstrate a working knowledge of the causes, symptoms and treatment or control of fifteen livestock diseases common to the area.

4. Determine when a veterinarian should be called to treat livestock.

5. List ten common preventative vaccinations or inoculations used to control animal diseases and indicate the uses of each.

6. List ten important sanitation measures used for control and prevention of animal diseases.

7. Demonstrate their ability to recognize environmental situations causing stress on livestock.

8. Demonstrate the ability to correctly use and analyze health records to prevent disease problems.

9. Prepare a planned program for maintaining high health standards for one class of livestock on a given farm or specific situation.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Recognizing Disease Symptoms</strong>&lt;br&gt;Objective 1&lt;br&gt;Define a disease.</td>
<td>A. Definition of an animal disease</td>
</tr>
<tr>
<td>Objective 2&lt;br&gt;Select and use references on animal diseases.</td>
<td>A. Select available references on animal diseases.&lt;br&gt;B. Make a list of references on animal diseases.</td>
</tr>
</tbody>
</table>
| **Unit 2 - Treating Livestock Diseases**<br>Objective 3<br>Demonstrate a working knowledge of the causes, symptoms and treatment or control of fifteen livestock diseases common to the area. | A. Animal diseases common to the area. Discuss causes, symptoms, treatment and control of diseases. <br>Examples: <br>Dairy<br>milk fever<br>ketosis<br>displaced abomasum<br>cow pox<br>Sheep<br>enterotoxemia<br>white muscle disease<br>blue tongue<br>General<br>bloat<br>scouring<br>parasites<br>(external, internal) reproductive diseases<br>Bovine<br>parasites<br>Swine<br>cholera<br>anemia<br>influenza<br>avian<br>rabies<br>rabies virus<br>Horses<br>colic<br>founder<br>Monday morning disease<br>bots<br>equineencephalomyelitis<br>Beef<br>eye cancer<br>prolapse<br>navel ill<br>equine<br>reproductive diseases<br>Equine<br>pneumonia<br>encephalomalacia<br>Parasites<br>tuberculosis<br>shipper's fever<br>pneumonia<br>entrails<br>Colds<br>pox<br>foot rot<br>shipping fever<br>parasites<br>pallor

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
</table>
| A. Teacher lecture  
B. Slides showing diseased animals | A. Students will check references and discuss definitions of animal diseases  
B. The class will arrive at a definition | A. Written test |
| A. Supervised study period | A. Students will find available references and develop a list of animal disease references for class use | A. Instructor will check list |
| A. Veterinarian speak to the class on common diseases in area  
B. Field trips to area farms to determine diseases common to area  
C. Individual supervised study  
D. Student reporting | A. Students should take notes for notebooks and future references  
B. Field trip reports  
C. Students should identify the major livestock diseases on their own farms and community | A. Written test on common diseases  
B. Oral test on common diseases  
C. Field trip report evaluation by instructor  
D. Notebook grade evaluation by instructor |
**OBJECTIVES BY UNIT**

<table>
<thead>
<tr>
<th>Objective</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 4  
Determine when a veterinarian should be called to treat livestock. | A. Factors to consider when calling a veterinarian.  
1. How sick is the animal?  
   - temperature  
   - pulse  
   - alertness  
   - breathing rate  
2. Can the animal be treated properly by farm personnel?  
   - Correct diagnosis of the problem  
   - Are proper medications available?  
   - Do you have the expertise to handle the problem? |

Unit 3 - Prevention of Livestock Diseases  
Objective 5  
List ten common preventative vaccinations or inoculations used to control animal diseases and indicate the uses of each. | A. Types of vaccinations and inoculations  
- Active immunity  
- Passive immunity  
B. Vaccinations and inoculations available (examples below) and their uses  
   - **Dairy & Beef Horses**  
     - BVD vaccine  
     - distemper vaccine  
     - CCSN bacterin  
     - TB vaccine  
     - encephalomyelitis lamb-vax  
     - brucellosis vaccine  
     - IBR  
   - **Swine**  
     - anti-hog cholera serum  
     - wart vaccine  
     - erysipelas vaccine  
     - shipping fever  
     - influenza vaccine  
     - IBR vaccine  
     - sepospirosis  
     - tri-sulfa injectable  
     - tetanus toxoid  
C. Proper use of vaccinations and inoculations |

Objective 6  
List 10 important sanitation measures used for control and prevention of animal diseases. | A. Proper sanitation measures to control diseases of livestock as in references such as "the 10 commandments of animal health" in the Pfizer Animal Health Handbook  
B. Initiating sanitation measures on farms  
   - Value to farmer in reducing disease  
   - Cost of sanitation measures  
   - Time involved |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and class discussion</td>
<td>A. Read sections that apply to specific diseases in Animal Health Handbooks.</td>
<td>A. Written test on lecture notes and field trip information.</td>
</tr>
<tr>
<td>B. Farm visits to determine how farmers handle herd health problems.</td>
<td>B. Given specific symptoms and conditions have students react to specific problems and explain how they would handle the situation.</td>
<td>B. Oral examinations regarding specific livestock problems.</td>
</tr>
<tr>
<td>A. Resource Personnel</td>
<td>A. During resource personnel visits, farm visits and class time students will be compiling a list of vaccinations used, how common they are, their effectiveness and their purpose.</td>
<td></td>
</tr>
<tr>
<td>- Local veterinarian can tell the class what preventative vaccinations he uses.</td>
<td>B. Individual supervised study on selected vaccinations and class reports on findings.</td>
<td>A. Written test</td>
</tr>
<tr>
<td>- Biological products salesman can tell the class what he has available.</td>
<td></td>
<td>B. Evaluate students notes</td>
</tr>
<tr>
<td>B. Farm visits to determine what farmers are using.</td>
<td></td>
<td>C. Evaluate students report in terms of completeness and effective use of references.</td>
</tr>
<tr>
<td>C. Class discussion to determine what is used on their farms.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Individual study and class reporting.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Individual supervised study to determine measures for different classes of livestock.</td>
<td>A. Students will determine effective sanitation measures for selected classes of livestock during individual supervised study.</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Group discussion</td>
<td></td>
<td>B. Evaluation of notes</td>
</tr>
<tr>
<td>C. Field trips to observe farm practices.</td>
<td></td>
<td>C. Evaluation of student ability to use references.</td>
</tr>
</tbody>
</table>

7 586
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 7  
Demonstrate their ability to recognize environmental situations causing stress on livestock. | A. Definition of stress from Pfizer or other references  
B. Types of stress on livestock  
C. Effects of stress on livestock  
D. Recognizing and preventing livestock stress |
| Objective 8  
Students will demonstrate their ability to correctly use and analyze health records to prevent disease problems. | A. Information needed in health record for each class of livestock.  
B. How to use livestock health records.  
C. How to analyze health records to prevent disease problems. |
| Objective 9  
Prepare a planned program for maintaining high health standards for one class of livestock, on a given farm, or specific situation. | A. The plan should include  
- History of past years animal health  
- Description of current situation  
- Description of factors causing health problems  
- Plan for maintaining livestock health |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture--discussion</td>
<td>A. Take notes during lecture discussion</td>
<td>A. Test students ability to recognize stress situation during a planned farm visit.</td>
</tr>
<tr>
<td>B. Field trips to find stress conditions on farms</td>
<td>B. Determine conditions causing stress during farm visits</td>
<td>B. Have students write suggestions for alleviating the stress situations.</td>
</tr>
<tr>
<td></td>
<td>C. Determine means of alleviating stress conditions and report orally to class.</td>
<td></td>
</tr>
<tr>
<td>A. Lecture--demonstrations showing types of records in use and information on them.</td>
<td>A. Students will develop lists of information needed on health records.</td>
<td></td>
</tr>
<tr>
<td>B. Individual supervised study having students develop records for selected livestock.</td>
<td>B. Students will develop health record forms to be used for one class of livestock which they choose.</td>
<td></td>
</tr>
<tr>
<td>C. Class problem solving--solve given problems on records in class to illustrate record use and analysis.</td>
<td>C. Students will fill in records with information given by the instructor and then analyze the information to determine what steps could be taken to prevent disease problems.</td>
<td></td>
</tr>
<tr>
<td>D. Field trip to observe types of health records in use by farmers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Students will prepare a planned health program for their farms or situation.</td>
<td>A. Have the students health program plan reviewed by the local veterinarian and parents. If satisfactory start implementing the health program on the local farm.</td>
<td></td>
</tr>
<tr>
<td>B. Oral report including questions regarding the report from class members and instructor.</td>
<td>A. Evaluation of written health program.</td>
<td></td>
</tr>
</tbody>
</table>

A. Evaluation of oral report.  
B. Evaluation of oral report.  
C. Allow credit for implementation of program as a result of supervised work experience on the home farm or cooperative farm.
MODULE OF INSTRUCTION

Title - MAINTAINING LIVESTOCK HEALTH

RESOURCE MATERIALS

Books
2. Agriculture In Our Lives. Krebs, Interstate
3. Dairy Science. Petersen, Lippincott
5. 1956 Yearbook of Agriculture-Animal Diseases
6. Infectious Diseases of Domestic Animals. Iowa State University

Bulletins
1. A Dairy Herd Health Program. Dairy herd disease control committee of N. Y. State Veterinary Medical Society
Selection of housing will be evaluated for specific types of livestock based on temperature, space requirements, and location of facilities.

Using skills developed, the selection of a housing design for a given animal production enterprise will depend on efficient use of labor, ease of mechanizing operations and initial cost of structure.

**MAJOR DIVISIONS OR UNITS OF CONTENT**

<table>
<thead>
<tr>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
</tr>
<tr>
<td>-------</td>
</tr>
</tbody>
</table>

1. Planning Livestock Housing Facilities  | 2 | 2 |
2. Housing Requirements for Various Types of Livestock | 4 | 2 |
3. Types of Livestock Housing Available | 6 | 14 |

| Total | 12 | 18 |

Revised June, 1974
OBJECTIVES to be obtained:

The student will be able to:

1. List five factors that should be considered when planning livestock housing facilities.

2. Calculate temperature, space and ventilation requirements for beef cattle, dairy cattle, swine, sheep, horses and poultry.

3. List the main sources of information on livestock housing.

4. List the advantages and limitations of the types of livestock housing.

5. List 14 factors that should be considered when selecting livestock housing.

6. Select and justify, in terms of the factors that should be considered when selecting livestock housing, an appropriate type of housing facility for a specific situation.
**OBJECTIVES BY UNIT**

<table>
<thead>
<tr>
<th>Unit 1 - Planning Livestock Housing Facilities</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1</td>
<td>A. Factors that should be considered when planning livestock housing facilities are:</td>
</tr>
<tr>
<td></td>
<td>- Type of livestock enterprise</td>
</tr>
<tr>
<td></td>
<td>- Climatic conditions</td>
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<td></td>
<td>- Soil conditions</td>
</tr>
<tr>
<td></td>
<td>- Drainage</td>
</tr>
<tr>
<td></td>
<td>- Accessibility to the farmstead complex</td>
</tr>
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<td></td>
<td>- Zoning regulations</td>
</tr>
<tr>
<td></td>
<td>B. Indicate the importance of adequate livestock housing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 2 - Housing Requirements for Various Types of Livestock</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 2</td>
<td>A. Temperature and Ventilation Requirements for:</td>
</tr>
<tr>
<td>Calculate temperature, space and ventilation requirements for beef cattle, dairy cattle, swine, sheep, horses and poultry.</td>
<td>- Dairy</td>
</tr>
<tr>
<td></td>
<td>- Beef</td>
</tr>
<tr>
<td></td>
<td>- Swine</td>
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<td></td>
<td>- Sheep</td>
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<td>- Poultry</td>
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<td></td>
<td>- Horses</td>
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<tr>
<td></td>
<td>B. Space Requirements for:</td>
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<tr>
<td></td>
<td>- Dairy</td>
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<td></td>
<td>- Beef</td>
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<td>- Swine</td>
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<td></td>
<td>- Sheep</td>
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<td></td>
<td>- Poultry</td>
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<tr>
<td></td>
<td>- Horses</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 3 - Types of Livestock Housing Available</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 3</td>
<td>A. Land grant colleges and extension service</td>
</tr>
<tr>
<td></td>
<td>- Cornell University Extension</td>
</tr>
<tr>
<td></td>
<td>- Iowa State University</td>
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<td></td>
<td>- Penn State University</td>
</tr>
<tr>
<td></td>
<td>- University of Illinois</td>
</tr>
<tr>
<td></td>
<td>B. Agri-Business Industry</td>
</tr>
<tr>
<td></td>
<td>- Agway Incorporated</td>
</tr>
<tr>
<td></td>
<td>-Ralston Purina Company</td>
</tr>
<tr>
<td></td>
<td>- Surge Dairy Systems</td>
</tr>
<tr>
<td></td>
<td>C. United States Department of Agriculture</td>
</tr>
<tr>
<td></td>
<td>D. Local Farmer</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Lecture</td>
<td>A. The student will relate the home farm or cooperative farm and report on the housing facilities.</td>
</tr>
<tr>
<td>B. Supervised study period.</td>
<td>B. Prepare a report that would list the strengths and weaknesses of the housing facilities. Indicate the factors that were not used in planning the livestock housing facilities.</td>
</tr>
<tr>
<td>C. Class discussion</td>
<td></td>
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<tr>
<td>D. Invite a number of the village, town or county planning board to discuss zoning regulations.</td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Make notations of highlights of field trips.</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>B. List the temperature, ventilation and space requirements for a specific livestock enterprise in notebooks.</td>
</tr>
<tr>
<td>C. Field trip to local farms</td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. List sources of references in notebook.</td>
</tr>
<tr>
<td>B. Supervised study. Review schools references</td>
<td>B. Complete field trip reports using format attached to this module</td>
</tr>
<tr>
<td>C. Field trips to farms and agri-business facilities</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td>Objective 4</td>
<td>A. Dairy</td>
</tr>
<tr>
<td></td>
<td>. Conventional</td>
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<tr>
<td></td>
<td>. Loose housing</td>
</tr>
<tr>
<td></td>
<td>. Free-stall system</td>
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<td></td>
<td>B. Beef</td>
</tr>
<tr>
<td></td>
<td>. Warm confinement</td>
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<td></td>
<td>. Cold confinement</td>
</tr>
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<td></td>
<td>C. Poultry</td>
</tr>
<tr>
<td></td>
<td>. Brooder houses</td>
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<td></td>
<td>. solar type</td>
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<td></td>
<td>. pole type</td>
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<td></td>
<td>. Laying houses</td>
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<td></td>
<td>. cage type</td>
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<td></td>
<td>. solar type</td>
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<td></td>
<td>. pole type</td>
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<td></td>
<td>. tilt-up concrete type</td>
</tr>
<tr>
<td></td>
<td>. pre-fab buildings</td>
</tr>
<tr>
<td></td>
<td>D. Sheep</td>
</tr>
<tr>
<td></td>
<td>. Sheds</td>
</tr>
<tr>
<td></td>
<td>. Lambing quarters</td>
</tr>
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<td></td>
<td>E. Swine</td>
</tr>
<tr>
<td></td>
<td>. Movable hog houses</td>
</tr>
<tr>
<td></td>
<td>. Permanent houses</td>
</tr>
<tr>
<td></td>
<td>. farrowing houses</td>
</tr>
<tr>
<td></td>
<td>. farrowing nursery units</td>
</tr>
<tr>
<td></td>
<td>. finishing units</td>
</tr>
<tr>
<td></td>
<td>F. Horses</td>
</tr>
<tr>
<td></td>
<td>. Horse barn (saddle)</td>
</tr>
<tr>
<td></td>
<td>. Stall type</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study on each type of livestock housing for each type of enterprise.</td>
<td>A. Prepare a list of the different types of housing available for each type of enterprise studied. List the advantages and limitations of each.</td>
<td>A. Written test. The student can list and describe at least two types of housing used for each livestock enterprise studied.</td>
</tr>
<tr>
<td>B. Class discussion and use of reflective thought process to organize ideas concerning each type of housing available.</td>
<td>B. Prepare and complete outline sheet for each field trip.</td>
<td>B. Evaluate field trip highlights.</td>
</tr>
<tr>
<td>C. Field trip to:</td>
<td></td>
<td>C. Oral quiz on field trip highlights.</td>
</tr>
<tr>
<td>- Dairy farm using conventional barn system</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Dairy using loose housing system</td>
<td></td>
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<tr>
<td>- Beef farm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Horse farm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Sheep, swine and poultry operation</td>
<td></td>
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<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
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<tr>
<td>--------------------</td>
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<td></td>
</tr>
<tr>
<td>Objective 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>List 14 factors that should be considered when selecting livestock housing.</td>
<td>A. Factors to consider in selecting livestock housing</td>
<td></td>
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<tr>
<td>Objective 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select and justify in terms of the factors that should be considered when selecting livestock housing, an appropriate type of housing facility for a specific situation.</td>
<td>A. Dairy</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Dairy</th>
<th>B. Dairy</th>
<th>C. Beef</th>
<th>D. Poultry</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 head operation</td>
<td>60 head operation</td>
<td>125 brood cows</td>
<td>100,000 bird unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200 feeder steers</td>
<td>60,000 bird unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30,000 bird unit</td>
</tr>
</tbody>
</table>
## LIVESTOCK HOUSING - Title

### TEACHING METHODS

| A. Supervised study  
| B. Show films and slides on livestock housing  
| C. Panel discussion  
| D. Guest speaker (town official) to present and discuss local, state and federal regulations which are pertinent to livestock housing.  
| E. Guest speaker (extension specialist) Topic: Location of livestock housing on the farm site |

### STUDENT APPLICATION ACTIVITIES

| A. List in notebooks, factors which can be found in references.  
| B. Discussion of factors found in films and slides  
| C. Discussion groups formed to each consider and prepare five factors to be presented in a panel discussion (one of each group sits on the panel)  
| D. Question the guest speaker  
| E. Question the guest speaker |

### EVALUATION PROCEDURES

| A. Written  
| B. Oral test  
| C. Notebook grade  
| A. Using notebooks containing all previously discussed information students will solve four problems related to livestock housing.  
| B. Students will work at problems related to the home farm or cooperative farm.  
| C. Work with sample forms solving specific housing problems.  
| A. Given a livestock situation and using references and notebooks, have students determine housing requirements for specific livestock enterprises |
Livestock Housing
F.P.M.

Field Trip "FD"
Types of Livestock Housing

1. Write the name of the type of livestock housing system visited.

2. Fill in the blanks pertaining to this business.
   a. Total size of this particular housing system
   b. Space dimensions per animal
   c. Number of animals housed
   d. Condition of animals
   e. Cost of structure
   f. List any particular problems discovered.

3. List at least one change you would make in this livestock housing unit.
Field Trip Outline #1
Beginning of field trip
1. List two types of reference information you expect to procure.
   1. __________________________________________
   2. __________________________________________

2. Write the name of the organization visited and the name and position of the man who conducted the tour, for further reference.

3. List the specific references made available to you pertaining to livestock housing.
   1. __________________________________________
   2. __________________________________________
   3. __________________________________________
   4. __________________________________________
   5. __________________________________________

4. List new ideas you acquired and should discuss in class.

5. Evaluation of field trip
   (Circle one)
   a. Information pertinent to our problem - Yes or No
   b. The guide was interesting - Yes or No
   c. The guide answered all of my questions - Yes or No
MODULE OF INSTRUCTION

Title - LIVESTOCK HOUSING

RESOURCE MATERIALS

Books: (teacher references)

(student references)
1. Beef Housing and Equipment Handbook - Ref. #1, Midwest Plan Service, Iowa State University
2. Dairy Equipment Plans and Housing Needs - Ref. #3, Midwest Plan Service, Iowa State University

Bulleting: (teacher references)
1. Dairy Automation - Agway
4. Appraising Farm Buildings - Vo-Ag Service, Univ. of Illinois

(student references)
2. Ref. #5 Cornell Agric. Ext. Bulletin #1159
3. Ref. #6 Costs and Performance Characteristics of Free Stall Housing System - Trattel & Loomis, Cornell A.E. Res. #243
4. Ref. #7 Stalls for Barns for the Dairy Herd, Cornell Misc. Bull. #60
5. Ref. #9 Agric. Engineering Ext. Bulletin #851-L
7. Ref. #11 Purina Nest Egg Factory, Ralston Purina Co.
8. Ref. #12 Purina Triple Deck Cage Egg Factory, Ralston Purina Co.
9. Ref. #13 Purina Cage Pullet House, Ralston Purina Co.
10. Ref. #14 Ventilation for Poultry Houses - Cornell Ext. Bulletin #1140

Audiovisuals:
1. 16 mm film - Dynamic Dairying - 16 min., Farm Film Corporation
2. 16 mm film - Modern Livestock Systems - 16 min., U.S. Steel Corp.
MODULE OF INSTRUCTION

Title - SELECTION, REGISTRATION, FITTING AND SHOWING OF FOUNDATION AND REPLACEMENT STOCK
Code - 01.01010699-01

DESCRIPTION:

Students enrolled in this module will be involved in the selection and replacement of livestock. The students will be working with procedures in judging and selecting livestock for longevity, conformation and productive ability. Considerable time will be spent on laboratory type exercises.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Breeds of dairy cattle</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2. Breeds of beef cattle</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3. Registration of cattle</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4. Livestock selection</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>5. Methods of selection</td>
<td>½</td>
<td>3</td>
</tr>
<tr>
<td>6. Fitting and showing of cattle</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>7. Classification of dairy cattle</td>
<td>⅓</td>
<td>2/24</td>
</tr>
</tbody>
</table>

Revised January, 1975
MODULE OF INSTRUCTION

Title - SELECTION, REGISTRATION, FITTING AND SHOWING
OF FOUNDATION AND REPLACEMENT STOCK

OBJECTIVES to be obtained:

The student will be able to:

1. List from memory the breed and origin of each of the five major breeds of dairy cattle.
2. List from memory the breed and origin of at least six breeds of beef cattle.
3. Compose to the instructors satisfaction and send a letter requesting information concerning cattle pedigree and registration to at least one breed association.
4. Correctly complete a breed registration application form.
5. Identify from memory at least 25 parts of a cow.
6. List 10 of the 12 factors to be considered when selecting foundation or replacement stock.
7. List from memory the categories of the dairy and the beef judging score cards including the value given to each category.
8. Compute a score for a given class of livestock using a Hormel scoring slide.
9. Judge with accuracy of 75% or better four classes of dairy and two classes of beef cattle.
10. List the advantages and disadvantages of selecting and purchasing foundation or replacement stock at local livestock markets, disposal sales, private sales and syndicate buying.
11. Given the age, production records, health records and a visual observance of five animals, select two animals which could be used as foundation animals or replacement stock and determine the sales value of each.
12. Properly groom an animal and show an animal to its best advantage in the show ring.
13. List four advantages of having a herd classified.
Title: SELECTION, REGISTRATION, FITTING AND SHOWING OF FOUNDATION AND REPLACEMENT STOCK

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Breeds of dairy cattle</strong></td>
<td><strong>A. Breeds of dairy cattle</strong></td>
</tr>
<tr>
<td><strong>Objective 1</strong></td>
<td>. Ayrshire - Scotland</td>
</tr>
<tr>
<td></td>
<td>. Brown Swiss-Switzerland</td>
</tr>
<tr>
<td></td>
<td>. Guernsey-British Isles, Isle of Guernsey</td>
</tr>
<tr>
<td></td>
<td>. Holstein-Holland</td>
</tr>
<tr>
<td></td>
<td>. Jersey-British Isles, Isle of Jersey</td>
</tr>
<tr>
<td></td>
<td>. Black Belted-Canada</td>
</tr>
<tr>
<td></td>
<td>. Others</td>
</tr>
<tr>
<td><strong>Unit 2 - Breeds of beef cattle</strong></td>
<td><strong>A. Breeds of beef cattle</strong></td>
</tr>
<tr>
<td><strong>Objective 2</strong></td>
<td>. Aberdeen Angus-Scotland</td>
</tr>
<tr>
<td></td>
<td>. Hereford - British Isles</td>
</tr>
<tr>
<td></td>
<td>. Brahman - India</td>
</tr>
<tr>
<td></td>
<td>. Charolais - France</td>
</tr>
<tr>
<td></td>
<td>. Shorthorn - British Isles</td>
</tr>
<tr>
<td></td>
<td>. Red Angus - U.S.</td>
</tr>
<tr>
<td></td>
<td>. Santa Gertruda - U.S.</td>
</tr>
<tr>
<td></td>
<td>. Cross breeds</td>
</tr>
<tr>
<td></td>
<td>. Polled Hereford</td>
</tr>
<tr>
<td></td>
<td>. Polled Shorthorn</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Objective 3</th>
<th>The student will compose to the instructors satisfaction and send a letter requesting information concerning cattle pedigree and registration to at least-one breed association.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Provide students with names and addresses of breed associations.</strong></td>
<td><strong>B. Review the reasons for and uses of pedigrees.</strong></td>
</tr>
<tr>
<td><strong>C. Provide students with basic letter format.</strong></td>
<td></td>
</tr>
</tbody>
</table>
# Teaching Methods

<table>
<thead>
<tr>
<th>A. Supervised study</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Slides of examples of each different breed.</td>
</tr>
<tr>
<td>C. Field trip to farms having as many of the major breeds as possible.</td>
</tr>
<tr>
<td>D. Use available magazines</td>
</tr>
</tbody>
</table>

# Student Application Activities

| A. Individual student research to discover origin of each breed. |
| B. Make a chart showing the following information for each breed of dairy cattle. |
| C. Field trips to farms having beef breeds. |

# Evaluation Procedures

| A. Written test |
| B. Oral test |
| C. Note taking |
| D. Students can review pedigrees. |
| E. Write a letter to a breed association. |

## Selection, Registration, Fitting and Showing of Foundation and Replacement Stock

| A. Note taking |
| B. Students can review pedigrees of cattle on the home farm |
| C. Write a letter to a breed association requesting information about requirements for registration. |

## Student Application Activities

| A. Individual student research to discover origin of each breed. |
| B. Make a chart showing the following information for each breed of dairy cattle. |
| C. Field trips to farms having as many of the major breeds as possible. |

## Evaluation Procedures

| A. Written test |
| B. Oral test |
| C. Note taking |
| D. Students can review pedigrees of cattle on the home farm |
| E. Write a letter to a breed association requesting information about requirements for registration. |
Title - SELECTION, REGISTRATION, FITTING AND SHOWING OF FOUNDATION AND REPLACEMENT STOCK

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 3 - Registration of cattle</td>
<td>A. Registration forms for various breeds</td>
</tr>
<tr>
<td>Objective 4</td>
<td>B. Drawing or picture of each side</td>
</tr>
<tr>
<td>Correctly complete a breed registration application form.</td>
<td>C. Notations of markings</td>
</tr>
<tr>
<td></td>
<td>D. Breeding and service dates</td>
</tr>
<tr>
<td></td>
<td>E. Prefix, naming of animal</td>
</tr>
<tr>
<td></td>
<td>F. Signatures</td>
</tr>
<tr>
<td>Unit 4 - Livestock selection</td>
<td>A. Parts of a dairy animal</td>
</tr>
<tr>
<td>Objective 5</td>
<td>B. Parts of a beef animal</td>
</tr>
<tr>
<td>Identify from memory at least 25 parts of the cow.</td>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective 6</td>
<td>A. Factors to consider</td>
</tr>
<tr>
<td>List 10 of the 12 factors to be considered when selecting foundation or replacement stock.</td>
<td>. Purebred or grades</td>
</tr>
<tr>
<td></td>
<td>. Selection of breed</td>
</tr>
<tr>
<td></td>
<td>. Size of herd</td>
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<td></td>
<td>. Uniformity</td>
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<td></td>
<td>. Health</td>
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<td>. Condition</td>
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<td>. Age and longevity</td>
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<td></td>
<td>. Reproductive ability</td>
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<td></td>
<td>. Milking ability</td>
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<tr>
<td></td>
<td>. Size</td>
</tr>
<tr>
<td></td>
<td>. Adaptation</td>
</tr>
<tr>
<td></td>
<td>. Price</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Supervised study using sample registration.</td>
<td>A. Practical practice of filling out an application for registry using the true type model cow and dates and information supplied by the instructor.</td>
</tr>
<tr>
<td>B. Have students actually complete registration forms.</td>
<td>B. Review the home or cooperative farms cattle registrations.</td>
</tr>
<tr>
<td>A. Lecture</td>
<td>A. Note taking</td>
</tr>
<tr>
<td>B. Using judging scorecard, naming and pointing out the parts of dairy and beef animals</td>
<td>B. Label the parts in their proper places on the drawing of a cow.</td>
</tr>
<tr>
<td>C. Use a slide showing cow with parts labeled.</td>
<td></td>
</tr>
<tr>
<td>A. Lecture</td>
<td>A. Note taking</td>
</tr>
<tr>
<td>B. Student discussion</td>
<td>B. Listing of factors to consider in selection</td>
</tr>
<tr>
<td>C. The judging manual</td>
<td>C. Panel discussion</td>
</tr>
<tr>
<td>D. Film--&quot;Animal Wonders&quot; Guernsey Cattle Club Peterboro, N. H.</td>
<td></td>
</tr>
</tbody>
</table>

- Registered US grade cattle and/or Holsteins vs colored breeds
<table>
<thead>
<tr>
<th>OBJECTIVES</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 7</strong>&lt;br&gt;List from memory the categories of the dairy and beef judging scorecards including the value given to each category.</td>
<td><strong>A. Categories of the dairy judging scorecard</strong>&lt;br&gt;- General appearance - 30&lt;br&gt;- Dairy character - 20&lt;br&gt;- Body capacity - 20&lt;br&gt;- Mammary system - 30&lt;br&gt;Total 100 pts.</td>
</tr>
<tr>
<td><strong>Objective 8</strong>&lt;br&gt;Compute a score for a given class of livestock using a Hormel scoring slide.</td>
<td><strong>A. Step by step procedure in computation of a placed class.</strong></td>
</tr>
</tbody>
</table>
| **Objective 9**<br>Judge with accuracy of 75% or better, four classes of dairy and two classes of beef cattle. | **A. Classification of livestock judging techniques**<br>- Consistency<br>- Classifications<br>- General appearance<br>- Dairy or beef character<br>**B. Show ring classes**<br>- Calf classes<br>- Cow classes<br>- Group classes
<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
</table>
| A. Lecture       | A. Practice using the Hormel scoring slide | A. Written and oral test Name the categories and their point evaluation found on the dairy judging scorecard.  
|                  |                                | B. Written and oral test Name the categories used in judging beef |
| B. Using scorecards review the major categories and the weight of each category listed on the official breed scorecards | B. Notes on reasons and evaluation of each category on the beef scorecard | |
| C. Slides showing dairy and beef breed animals | | |
| A. Demonstrate the use of the Hormel scoring slide | A. Demonstrate the use of the Hormel scoring slide | A. Provide information required for scoring classes of livestock. Grade students on these exercises. |
| | A. Lecture (short) | |
| | B. Slides and tape of dairy judging Cornell Slides by Hartman | |
| | C. Demonstration of judging on the farm | |
| | D. Field trips to show herds | |
| | E. Beef cattle judging slides - IMS | |
| | F. Beef cattle judging handbook - IMS | |
| A. Lecture | A. Note taking | A. Given two classes of dairy and two classes of beef cattle the student will place the animals and receive a score for a grade on the exercise. |
| B. Slides and tape of dairy judging Cornell Slides by Hartman | B. Class discussion | |
| C. Demonstration of judging on the farm | C. Practice judging-field trips | |
| D. Field trips to show herds | D. Enter Hoard's dairyman Dairy Judging Contest | |
| E. Beef cattle judging slides - IMS | E. Students could compete at sub district, district and state FFA sponsored dairy judging contests. | |
## Unit 5 - Methods of Selection

### Objective 10
List the advantages and disadvantages of selecting and purchasing foundation or replacement stock at local livestock markets, dispersal sales, private sales and syndicate buying.

### Objective 11
Given the age, production records, health records, and a visual observation of five animals, select two animals which could be used as foundation animals or replacement stock and determine the sales value of each.

## Unit 6 - Fitting & Showing of Cattle

### Objective 12
Properly groom an animal and show an animal to its best advantage in the show ring.

### Objective 13
List four advantages of having a herd classified.
MODULE OF INSTRUCTION

Title - Management of Young Dairy and Beef  

Code - 01.01010699-02

DESCRIPTION:

Students enrolled in this module will be primarily involved with the care of newborn and young cattle. A special emphasis will be placed on housing facilities, health and feeding. Other involvements include the skills of dehorning, castration, removal of extra teats, hoof trimming, clipping for show. The recognition of heat and parturition will be covered.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocations</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Care and Handling of Calves at Birth</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. The Housing Needs of Calves</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>3. Feeds and Feeding Practices of Calves to 6 Months of Age</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>4. Special Health Management Practices</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>5. Feeding and Management of Youngstock from 2 Months to Freshening</td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>

Revised August '75
OBJECTIVES to be obtained:
The student will be able to:

1. List the essentials of an adequate calving area so the calf can be born safely and under conditions that can enhance its survival.

2. List the five most prominent signs of the oncoming of parturition in cattle.

3. List the eight steps to follow in caring for a newborn calf, immediately following birth.

4. Recognize to the instructor's satisfaction four symptoms indicating digestive disorders in newborn calves during the weaning and growing periods.

5. Determine the basic housing needs essential for calves and recognize the advantages and disadvantages of the various housing facilities.

6. List six essentials of a good housing sanitation program.

7. List four requirements of hay used for calves, and three necessary ingredients of concentrates used in a calf feed program.

8. Outline on paper a calf feeding program ranging from birth to the age of six months.

9. Use a weight measuring tape and demonstrate his ability to estimate the weight of an animal to the instructors satisfaction.

10. Demonstrate his ability to dehorn a calf, electrically, remove extra teats, using surgical scissors, and trim an animal's feet.

11. List the causes, symptoms, and controls of at least seven different calf diseases and four heifer diseases.

12. Outline on paper a heifer feeding program from six months of age to freshening.

13. Recognize the various types of housing for heifers and evaluate each method.

14. Determine when to breed heifers according to size, age and season and be able to list three symptoms and the length of time for each part of the heat cycle.

15. Prepare a heifer for freshening.
## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 1 - Care and Handling of Calves at Birth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 1</strong></td>
</tr>
</tbody>
</table>

| **Objective 2** | List the five most prominent signs of the oncoming of parturition in cattle. |

| **Objective 3** | List the eight steps to follow in caring for a newborn calf, immediately following birth. |

## CONTENT

<table>
<thead>
<tr>
<th>A. Calving areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Box stall</td>
</tr>
<tr>
<td>• Old horse stall</td>
</tr>
<tr>
<td>• Yard near barn - summer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Parturition signs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dropping of abdomen</td>
</tr>
<tr>
<td>• Sunken area around penis</td>
</tr>
<tr>
<td>• Swollen and red vulva</td>
</tr>
<tr>
<td>• Mucous discharge</td>
</tr>
<tr>
<td>• Restlessness</td>
</tr>
<tr>
<td>• Fullness of udder, teats distended</td>
</tr>
<tr>
<td>• Standing up and lying down continuously</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Breathing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Nasal mucus</td>
</tr>
<tr>
<td>• Stimulation</td>
</tr>
<tr>
<td>• Artificial respiration</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Cleaning and drying</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Navel wound treatment</td>
</tr>
<tr>
<td>D. Assistance in nursing</td>
</tr>
<tr>
<td>E. Quarters</td>
</tr>
<tr>
<td>• Clean</td>
</tr>
<tr>
<td>• Dry</td>
</tr>
<tr>
<td>• Draft free</td>
</tr>
</tbody>
</table>
Management of Young Dairy - Title and Beef

<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Include inspection of calving areas when on calf housing field trips.</td>
<td>A. Note taking on field trips and classroom work.</td>
<td>A. Test - Written on the ideal calving area.</td>
</tr>
<tr>
<td>B. Supervised study period</td>
<td>B. Discussion of individual students calving areas on home farm or employers farm.</td>
<td>B. Evaluate student reports.</td>
</tr>
<tr>
<td>C. Lecture</td>
<td>C. Students develop their own system of caring and handling calves at birth.</td>
<td></td>
</tr>
<tr>
<td>D. Classroom discussion</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A. Lecture

B. Arrange for a field trip to observe a cow giving birth.

A. Lecture

B. Supervised study

C. Students discuss procedures used on the home farm regarding the caring of a newborn calf.

A. Note taking on discussion and lecture

B. Involve student in actual on-the-farm observation

A. Notes listing steps to be taken.

B. Involve student in actual calf delivery on the home farm or cooperative farm.

A. Test orally or written. Name five most prominent signs of the oncoming of parturition in cattle.

A. Test orally or written. Name eight steps to follow in caring for the newborn calf immediately following birth.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 4</td>
<td>Recognize to the instructor's satisfaction four symptoms indicating digestive disorders in newborn calves during the weaning and growing periods.</td>
</tr>
<tr>
<td></td>
<td>A. Off-feed</td>
</tr>
<tr>
<td></td>
<td>B. Unthriftiness</td>
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<td></td>
<td>C. Low temperature</td>
</tr>
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<td></td>
<td>D. Loose bowel</td>
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<td></td>
<td>E. Tight bowel</td>
</tr>
<tr>
<td></td>
<td>F. Bloating</td>
</tr>
<tr>
<td>Objective 5</td>
<td>Determine the basic housing needs essential for calves and recognize the advantages and disadvantages of the various housing facilities.</td>
</tr>
<tr>
<td></td>
<td>A. Housing types</td>
</tr>
<tr>
<td></td>
<td>- Boxstalls 30-50 sq ft per calf</td>
</tr>
<tr>
<td></td>
<td>- 50-150 sq ft per heifer</td>
</tr>
<tr>
<td></td>
<td>- Slatted floor stalls - 1 calf each</td>
</tr>
<tr>
<td></td>
<td>- Tied in free area</td>
</tr>
<tr>
<td></td>
<td>B. Essentials of housing area</td>
</tr>
<tr>
<td></td>
<td>- Draft free</td>
</tr>
<tr>
<td></td>
<td>- Dry</td>
</tr>
<tr>
<td></td>
<td>- Adequate water</td>
</tr>
<tr>
<td></td>
<td>- Hay rack</td>
</tr>
<tr>
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<td>- Grain box</td>
</tr>
<tr>
<td>Objective 6</td>
<td>List six essentials of a good housing sanitation program</td>
</tr>
<tr>
<td></td>
<td>A. Sanitation</td>
</tr>
<tr>
<td></td>
<td>- Discard old litter and feed from stall</td>
</tr>
<tr>
<td></td>
<td>- Allow the stall to dry</td>
</tr>
<tr>
<td></td>
<td>- Disinfect floor, walls, ceiling</td>
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<td></td>
<td>- Disinfect all utensils to be used by calf</td>
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<td>- Allow stall to air and dry for at least 2 days</td>
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<td></td>
<td>- Place clean dry bedding in the stall</td>
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<td></td>
<td>- Clean stall weekly</td>
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<tr>
<td></td>
<td>B. Management</td>
</tr>
<tr>
<td></td>
<td>- Keep housing clean</td>
</tr>
<tr>
<td></td>
<td>- Ventilation</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>A. Supervised study period</td>
<td>A. Students write a report relating to digestive disorders of calves on the home farm.</td>
</tr>
<tr>
<td>B. Field trip to a farm having many calves</td>
<td></td>
</tr>
<tr>
<td>C. Slide presentation showing digestive disorder symptoms.</td>
<td></td>
</tr>
<tr>
<td>A. Lecture</td>
<td>A. Blueprint a design of adequate calf housing structure for individual calf or a group system for calves.</td>
</tr>
<tr>
<td>B. Field trips to calf housing facilities of various structure and systems.</td>
<td>B. Construct an individual calf pen in shop</td>
</tr>
<tr>
<td>C. Discussion</td>
<td></td>
</tr>
<tr>
<td>A. Movie on calf rearing</td>
<td>A. Note taking</td>
</tr>
<tr>
<td>B. Field trip to a local farm to inspect desirable housing facilities.</td>
<td>B. Discussion of sanitary precautions taken on home farm or employer's farm.</td>
</tr>
</tbody>
</table>

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# Objective 7
List four requirements of hay used for calves, and three necessary ingredients of concentrates used in a calf feeding program.

- Hay
  - Green
  - Leafy
  - Palatable
  - Early-cut, early June

# Objective 8
Outline a calf feeding program ranging from birth to the age of six months.

- Feeding schedules for dairy and beef calves
  - The digestive tract
  - Milk feeding requirements
  - Using milk replacer
  - Limited milk feeding and dry calf starter
  - Nurse cow method
  - Skim milk method
  - Sour colostrum method

# Objective 9
Use a weight measuring tape, and demonstrate his ability to estimate the weight of an animal to the instructor's satisfaction.

- Tape
  - Weight in ratio to inches
  - Orientation to area of heart girth
  - Tension on the tape
  - Record information
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. List feeding requirements of calves from birth to six months of age. Apply this knowledge by actually following approved recommendations in feeding calves used for students' supervised work experience programs.</td>
<td>A. Test - oral or written. State four requirements of hay, and three requirements of concentrates.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>Let students bring calf starter tags into class.</td>
<td>B. Grade student on calf project performance.</td>
</tr>
<tr>
<td>C. Bring roughage samples to class. Discuss the quality of roughages. Set up a lab exercise so that students could actually handle, and rank.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Procure information concerning feeding programs for calves. B. Panel discussion - Feeding whole milk vs. milk replacers. C. Students select a calf feeding program, discuss the advantages of the program.</td>
<td>A. A written test on feeding program content. B. Grade student's report on his feeding program method.</td>
</tr>
<tr>
<td>B. Film strip on raising dairy calves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Speaker, local farmer, or calf grower.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Demonstration</td>
<td>A. Practice practical application of content on the home farm and in supervised work experience programs.</td>
<td>A. Oral evaluation B. Performance grade on field trip exercises.</td>
</tr>
<tr>
<td>B. Supervised practice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Field trip, have all students tape animals and record the data.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Objectives by Unit

<table>
<thead>
<tr>
<th>Unit 4 - Special Health Management Practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 10</td>
</tr>
<tr>
<td>Demonstrate his ability to dehorn a calf electrically, remove extra teats, using surgical scissors, and trim an animal’s feet.</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Objective 11</td>
</tr>
<tr>
<td>List the causes, symptoms, and controls of at least seven different calf diseases and four heifer diseases.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Dehorning</td>
</tr>
<tr>
<td>B. Removing extra teats</td>
</tr>
<tr>
<td>C. Care of the feet, Trim feet</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 5 - Feeding &amp; Management of Young Stock from 2 Months to Freshening</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 12</td>
</tr>
<tr>
<td>Outline on paper a heifer feeding program from 2 months of age to freshening.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Feeding schedule for dairy heifer</td>
</tr>
<tr>
<td>B. Feeding schedules for beef heifer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Housing for heifers</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Stanchions and exercise yard</td>
</tr>
<tr>
<td>B. Pen stabling</td>
</tr>
<tr>
<td>C. Free stall</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>A. Supervised study</td>
</tr>
</tbody>
</table>
| B. Field trip for demonstrations | B. Dehorning  
   - Teat removal  
   - Trimming of feet | B. Written test on Objective 10 content. |
| C. Speakers-veterinarian or taped interview of key farmers. | | |
| | | |
| A. Supervised study of diseases and parasites | A. Using references the student will seek and write the causes, symptoms, and control of diseases studied. | A. Written test on causes, symptoms, and control of seven calfhood and four diseases of older heifers. |
| B. Veterinarian invited to the classroom for lecture and discussion. | B. Involve students in disease control on the home farm or employers farm. | |
| C. Film on common calf diseases. | | |
| | | |
| A. Lecture | A. Develop a feeding program for heifers on the home farm or cooperative farm. | A. Test - oral or written of heifer feeding program. |
| B. Supervised study | | B. Test on key words related to the objective content. |
| C. Movie-Heifer Management | | |
| | | |
| A. Lecture | A. Design a heifer housing arrangement. | A. Instructor's evaluation of heifer housing design. |
| B. Field trip to observe various heifer housing arrangements. | | |
| C. Panel discussion  
   Free stall vs. Stanchions | | |

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 14</strong></td>
<td>A. When to Breed Heifers</td>
</tr>
<tr>
<td></td>
<td>* Size</td>
</tr>
<tr>
<td></td>
<td>* Age</td>
</tr>
<tr>
<td></td>
<td>* Season</td>
</tr>
<tr>
<td></td>
<td>B. Symptoms and Length of Heat Cycle</td>
</tr>
<tr>
<td></td>
<td>* Approaching heat</td>
</tr>
<tr>
<td></td>
<td>* Standing heat</td>
</tr>
<tr>
<td></td>
<td>* Terminating heat</td>
</tr>
<tr>
<td><strong>Objective 15</strong></td>
<td>A. Proper conditioning of heifer</td>
</tr>
<tr>
<td></td>
<td>* Time and feed involved</td>
</tr>
<tr>
<td></td>
<td>B. Training heifer to adjust to</td>
</tr>
<tr>
<td></td>
<td>* Milking parlor</td>
</tr>
<tr>
<td></td>
<td>* Stanchion</td>
</tr>
</tbody>
</table>

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### Management of Young Dairy and Beef

#### Teaching Methods

| A. Mimeo handout made up by the teacher (acquired through Eastern breeders) |
| B. Problem solving technique Slide and tape set from University of Wisconsin Raising dairy calves and heifers |
| C. Lecture and class discussion |

#### Student Application Activities

| A. Students can apply knowledge acquired in determining breeding ages of heifers on the home farm or cooperative farm. |
| A. Note taking on lecture and discussion period. |

#### Evaluation Procedures

| A. Test-written complete a heat cycle. List heat symptoms and determine the best time for breeding heifers. |
| A. Test-oral or written on procedures used to properly condition a heifer for freshening. |
Title - Management of Young Dairy and Beef

RESOURCES MATERIALS

Books

1. Cattleman's Handbook, Interstate
2. Sanitation and Disease Control, Interstate
3. Feeds and Feeding Abridged by Morrison, Interstate
4. Animal Science by Ensminger, Interstate

Bulletins

1. Raising dairy calves and heifers, Cornell Ext. Bulletin 76
2. 4-H Bulletins - Calf Raising, Agric. Ed.
3. Agway
   Purina
   Wayne
   Beacon
   These companies are known to prepare bulletins which may be procured from local feed dealers.

4. IMS, Stone Hall, Cornell Univ., Ithaca, N.Y.
   Dairy Cattle Feeding (F30, F31)
   Dairy Nutrition (F34, F35)

Periodicals

Hoards Dairymen Magazine
Farm Journal Magazine
Successful Farming Magazine
Breed Association Magazine or Journals
Feed company news
American Agriculturist
American Stockman

Audiovisuals

Movie Calf Rearing - Purina Feeds, Ralston Purina Co., Checkerboard Square
St. Louis, Mo.
Wayne Feeds

Filmstrip and record
Calf rearing
Heifer magazine
Slides 0.3 Raising Dairy Calves - Cornell Film Library
Title - RAISING DAIRY BEEF

DESCRIPTION:

The student will be involved with developing the skills needed for the starting, growing, and finishing and marketing of dairy beef for human consumption.

Emphasis will be placed on breed selection for maximum growth, feeding, castrating, inoculating the calf, feeding and finishing the steer.

Special, feed and housing requirements will also be determined.

MAJOR DIVISIONS OR UNITS OR CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Selecting, feeding and housing</td>
<td>4</td>
</tr>
<tr>
<td>2. Health</td>
<td>2</td>
</tr>
<tr>
<td>3. Growing</td>
<td>4</td>
</tr>
<tr>
<td>4. Finishing and marketing</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

Revised June '75
OBJECTIVES to be obtained:

The student will be able to:

1. State four reasons why the largest dairy breeds are selected to be raised for beef, and systematically select the breed preferred by the student. Substantiate this answer with four reasons.

2. Outline a feeding program, to the instructor's satisfaction, which could be used in raising calves from birth to six weeks of age.

3. List seven requirements to consider when preparing a housing facility for growing dairy beef calves from birth to six weeks.

4. Identify the causes, symptoms, and controls of calf diseases.

5. Demonstrate the ability to detect diseases, involving at least three symptoms each for the two stress diseases.

6. Demonstrate the ability to administer injections, use a Balling gun, take and record temperature readings.

7. Outline to the instructor's satisfaction, a health program which could be implemented for dairy beef calves for the period from birth to six weeks of age.

8. Demonstrate the ability to castrate, dehorn, and trim hooves, on young animals.

9. Identify at least ten diseases, and their symptoms, common to dairy beef animals from six weeks of age to finish.

10. Outline a feeding program for dairy beef from age six weeks to finish.

11. Select 10 requirements of housing, and lot facilities required for growing dairy beef steers six weeks to finish.

12. Name the proper feeding techniques to be used in finishing Dairy Beef.

13. Locate five facilities available for marketing Dairy Beef.
Title: RAISING DAIRY BEEF

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Selection, Feeding, and Housing</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Objective 1</strong></td>
<td>State four reasons why the larger dairy breeds are selected to be raised for beef, and systematically select the breed preferred by the student. Substantiate this answer with four reasons.</td>
</tr>
</tbody>
</table>

### A. Dairy Breeds

<table>
<thead>
<tr>
<th>Breed</th>
<th>Birth (lbs)</th>
<th>Maturity (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holstein</td>
<td>100-110</td>
<td>16-1800</td>
</tr>
<tr>
<td>Brown Swiss</td>
<td>100+</td>
<td>14-1600</td>
</tr>
<tr>
<td>Ayrshire</td>
<td>90-100</td>
<td>12-1400</td>
</tr>
<tr>
<td>Guernsey</td>
<td>85-90</td>
<td>1000-1300</td>
</tr>
<tr>
<td>Jersey</td>
<td>60-80</td>
<td>1200</td>
</tr>
</tbody>
</table>

### B. Beef Breeds

- Angus
- Hereford (Birth wt. in Guernsey-Jersey range)
- Shorthorn
- Brahman
- Charolais

### C. Other Factors

- Availability and cost
- Time period involved - Birth to 1 year
- Weight gain 100-1000 lbs.
- Dressability
- Feed consumption (total cost)
- Feed/profit ratio
**MODULE OF INSTRUCTION**

Title - **SNAP BEAN PRODUCTION**

**Code** - 01.01020107-02

**DESCRIPTION:**

This is a study of the vegetable industry and the problems involved in snap bean production. Laboratory periods will include practical experience in the cultural operation of growing and harvesting vegetable crops.

Laboratory experiences involve cost accounting procedure specific to vegetable crops. Adjustment and maintenance of field equipment specific to vegetable crops will be covered.

**MAJOR DIVISIONS OR UNITS OF CONTENT**

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Costs and returns on vegetable crops</strong></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>2. Processor's contract provisions</strong></td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>3. Selecting a suitable field</strong></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>4. Fertilizing snap beans</strong></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>5. Planting and chemical weed controls</strong></td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>6. Insect and disease controls</strong></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>7. Cultivation</strong></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>8. Harvesting and delivering</strong></td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12</td>
<td>18</td>
</tr>
</tbody>
</table>

Revised June, 1974
MODULE OF INSTRUCTION

Title - SNAP BEAN PRODUCTION

OBJECTIVES to be obtained:

The student will be able to:

1. List the factors affecting costs and returns of the crop.
2. Complete a cost account record on a given crop enterprise.
3. List the major provisions of a processor's contract.
4. Identify the factors of field conditions that limit the field’s suitability to snap bean production.
5. Select the most economical analysis and amount of fertilizer for the crop.
6. Identify weeds, insects and diseases common to a given crop in the area.
7. List the controls for the insects and diseases common to the crop in a given area.
8. Identify profitable cultivation practices for the crop.
9. Have an awareness of the operation of mechanical harvesting and handling equipment including delivery trucks.
### Objectives by Unit

**Unit 1 - Costs and returns on vegetable crops**

**Objective 1**
List the factors affecting costs and returns of the crop.

**Objective 2**
Complete a cost account record on a given crop enterprise.

**Unit 2 - Processor's Contract Provisions**

**Objective 3**
List the major provisions of a processor's contract.

### Content

#### A. Costs
- Growing
  - land
  - fertilizer
  - sprays and dust
  - seed
  - labor
  - tractor
  - other equipment
  - interest
  - cover crop
  - other costs
- Harvesting
  - labor
  - tractor
  - trucking
  - custom harvesting
  - other
- Storing and selling

#### B. Returns
- Other factors
  - costs to grow a ton
  - costs to harvest a ton
  - costs to store and sell a ton
  - net cost per ton
  - return per ton

#### C. Other factors
- Costs account records
- Expenses
- Income

#### B. Calculate profit or loss
- Planting dates
- Grades
- Methods of grading
- Methods of payment
- Variety of seed
- Field man supervision
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Students can check cost items for producing the crop and prices for produce at marketing time.</td>
<td>A. Written test on crop production costs including the affect of yields and unit prices on total profit.</td>
</tr>
<tr>
<td>B. Lecture</td>
<td>B. Take notes on supervised study questions, lecture and guest speakers.</td>
<td></td>
</tr>
<tr>
<td>C. Resource person, field personnel from processor or chain store buyer.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Calculate cost and returns using enterprise records</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study period using sample cost account records showing vegetable enterprise accounting.</td>
<td>A. Notes on sample account records, class discussion and field trip.</td>
<td>A. Notebook grade</td>
</tr>
<tr>
<td>B. Class discussion regarding input costs, market prices, yields per acre and how these factors influence profit or loss.</td>
<td>B. Students could develop costs and returns for a vegetable project as a part of their supervised work experience program.</td>
<td>B. Written quiz on cost account problem for a snap bean enterprise.</td>
</tr>
<tr>
<td>C. Invite vegetable producer to discuss the business with students in class or on a field trip.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Class lecture on processor requirements</td>
<td>A. Notes on class lecture, discussion and field personnel information.</td>
<td>A. Oral exam on contract provisions.</td>
</tr>
<tr>
<td>B. Class discussion on grower and processor responsibilities</td>
<td></td>
<td>B. Note book grade.</td>
</tr>
<tr>
<td>C. Review contracts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Invite field personnel to discuss production and harvesting problems.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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**OBJECTIVES BY UNIT**

<table>
<thead>
<tr>
<th>Unit 3 - Selecting a suitable field</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 4</td>
</tr>
</tbody>
</table>

**CONTENT**

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Soil</td>
<td>. Type . Drainage . Fertility</td>
</tr>
<tr>
<td>B. Adaptability to mechanical planting, culture practices and harvesting</td>
<td></td>
</tr>
<tr>
<td>C. Limiting factors</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 4 - Fertilizing snap beans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Soil test</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 5 - Planting and chemical weed controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Preparing the seedbed</td>
</tr>
<tr>
<td>B. Planting the crop</td>
</tr>
<tr>
<td>C. Selection and application of herbicides and insecticides</td>
</tr>
<tr>
<td>D. Selecting disease resistant varieties</td>
</tr>
</tbody>
</table>

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# Teaching Methods

| A. Supervised study period |
| B. Class lecture and discussion |
| C. Slides |
| D. Field trip |

# Student Application Activities

| A. Notes on class lecture, discussion and slides. |
| B. Field trip report on selecting suitable fields for snap bean production. |

# Evaluation Procedures

| A. Written exam on objective content. |

## Teaching Methods

| A. Supervised study |
| B. Lecture and discussion |
| C. Slides on proper fertilization and deficiencies |

## Student Application Activities

| A. Notes on supervised study. |
| B. Students lab on soil testing and fertilizer. Recommendations for a given soil and crop. |
| C. Adjust and calibrate fertilizer equipment. |

## Evaluation Procedures

| A. Written exam on soil testing procedures, fertilizer analysis, rates and application methods. |
| B. Test on unknown soil samples, lab project. |
| C. Performance grade on adjustment and calibration of equipment. |

## Teaching Methods

| A. Supervised study |
| B. Lecture |
| C. Class discussion |

## Student Application Activities

| A. Land lab project for FFA crop demonstration. |
| B. Students visit snap bean growers in the area to discuss crop problems. Take notes on the field trip. |
| C. Collect weeds, insects and diseased plants for a classroom display. |

## Evaluation Procedures

| A. Written exam |
| B. Field trip report |
| C. Evaluate display of weeds, insects and diseased plants. |
# Title
SNAP BEAN PRODUCTION

## Objectives by Unit

### Unit 6 - Insect and disease control

**Objective 7**
List the controls for the insects and diseases common to the crop in a given area.

#### A. Insect identification
- Life cycles
  - Mexican bean beetle
  - leaf hoppers
  - aphids
  - mites
  - root worms

#### B. Diseases and controls
- leaf spot
- anthracnose
- fungus
- mosaic
- blight
- dry root rot

### Unit 7 - Cultivation

**Objective 8**
Identify profitable cultivation practices for the crop.

#### A. Cultivation
- Control weeds
- Prevent moisture loss

#### B. Methods of cultivation
- Time
- Depth

### Unit 8 - Harvesting and Delivering

**Objective 9**
Have an awareness of the operation of mechanical harvesting and handling equipment including delivery trucks.

#### A. Custom hire vs own harvester

#### B. Mechanical ladders

#### C. Trucking
- Body Requirements
- Scheduling

---

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8
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Notes on lecture, insect and disease identifications.</td>
<td>A. Written exam</td>
</tr>
<tr>
<td>B. Insect charts</td>
<td>B. Students can visit farms during growing season to observe crops, identify insects and diseases affecting the crop. Make recommendations regarding the controls.</td>
<td>B. Field trip report</td>
</tr>
<tr>
<td>C. Disease charts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Slides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Lecture</td>
<td>A. Notes on lecture, field trip report and slides</td>
<td>A. Written or oral test</td>
</tr>
<tr>
<td>B. Field trip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Slides</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Notes on supervised study, class lecture and slides.</td>
<td>A. Written or oral test</td>
</tr>
<tr>
<td>B. Class lecture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Chalk and board</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Slides</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RESOURCE MATERIALS

Periodicals:

Bulletins:
2. Vegetable Diseases, C.E.B. 1034
3. Field Crops Cost and Returns Ag Econ. Res. Yearly
4. Cost and Returns on Snap Beans Production, Ag. Econ. Res. Yearly
5. Cornell Recommends for Veg Crops, yearly
6. Farm Management Handbook, Ag Econ. Ex 440 yearly
MODULE OF INSTRUCTION

Title - PLANT DISEASE CONTROL

DESCRIPTION:

A definite portion of plant science must be devoted to the plant, its susceptibility to diseases, and the control of these diseases. In order to maintain plant health and economic stability in raising crops, one must understand the methods of efficient control of these diseases.

The student studying this module will be involved with identifying the causes and symptoms, as well as the controlling of disease in plants which are common to production agriculture.

Emphasis will be placed upon identification of disease symptoms, and relating these to the causal organisms. Safety in the use of chemical controls, and the machinery involved will also be emphasized.

Much of the laboratory time will be devoted to gathering and analyzing specimens and using machinery.

DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocation</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identification and control</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>2. Safe use of machinery and chemicals</td>
<td>0/1</td>
<td>6/29</td>
</tr>
</tbody>
</table>

Revised August 1975
OBJECTIVES to be obtained:

The student will be able to:

1. Write to the instructor's satisfaction, a working definition of the word disease, in reference to plants. Develop a plan that will demonstrate how plant diseases affect crop yields and profits.

2. Collect and identify specimens of eight diseases of cereal grain crops.

3. Collect and identify specimens of four row crop plant diseases.

4. Collect and identify specimens of ten diseases of pasture (forage) crops.

5. Collect and identify specimens of ten vegetable crop diseases.

6. Develop a preventative program for one disease in each of objectives 2, 3, 4, and 5.

7. Select the proper chemical control method for each of the diseases selected in objective 6.

8. List and demonstrate 15 precautions to use when working with disease control chemicals.

9. Calibrate to the instructor's satisfaction, a sprayer which will be used to apply a disease control chemical.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Identification and Control</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Objective 1</strong> Write to the instructors satisfaction, a working definition of the word disease, in reference to plants. Develop a plan that will demonstrate how plant diseases affect <em>crop yields</em> and profits.</td>
<td></td>
</tr>
<tr>
<td><strong>Objective 2</strong> Collect and identify specimens of eight diseases of cereal grain crops.</td>
<td></td>
</tr>
<tr>
<td><strong>Objective 3</strong> Collect and identify specimens of four row crop plant diseases.</td>
<td></td>
</tr>
</tbody>
</table>

A. **Definition (possible)**
Infectious or non-infectious occurrences which cause damage and death to plants and economic loss to the grower. These occurrences are the results of the presence of a susceptible host, a pathogenic organism, good organism distribution, and proper environment. Infection may occur and a disease become established only when all phases are complete.

B. **Causes** - Fungi, Bacteria, Viruses, Nematodes
- Dwarf bunt - winter wheat
- Common bunt - winter wheat
- Mildew - barley
- Leaf scald - barley
- Smut - barley
- Stem rust - oats
- Crown rust - oats
- Black stem - oats
- See IMS Sheets. Forage Crops - Disease and Insect Sheet (FFA Contest)

- Corn - the main row crop, N.Y.S.
  - Yellow leaf blight
  - Southern corn leaf blight
  - Maize dwarf mosaic
  - Smut
  - Anthracnose - beans
  - Bean blight
  - Mosaic - beans
  - Potato scab

- Potato blight - late
- Potato blight - early
<table>
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<tr>
<th>TEACHING METHODS</th>
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<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lecture</strong></td>
<td><strong>Note Taking</strong></td>
<td>Teacher evaluation of</td>
</tr>
<tr>
<td></td>
<td>List all points concerning</td>
<td>written definition.</td>
</tr>
<tr>
<td></td>
<td>diseases discussed in each</td>
<td></td>
</tr>
<tr>
<td></td>
<td>reference.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Discuss material discovered.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Write the definition of a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>plant disease.</td>
<td></td>
</tr>
<tr>
<td><strong>Supervised study</strong></td>
<td>A. List from the references</td>
<td>Written test to identify</td>
</tr>
<tr>
<td>. Vegetable diseases</td>
<td>the diseases of cereals</td>
<td>the diseases - Use IMS</td>
</tr>
<tr>
<td>. Southern corn leaf</td>
<td>B. Collect specimens of each</td>
<td>sheets -</td>
</tr>
<tr>
<td>. blight</td>
<td>disease and compare it with a</td>
<td>. Forage crop insects</td>
</tr>
<tr>
<td>. Open door to plenty</td>
<td>healthy specimen - store in</td>
<td>and diseases</td>
</tr>
<tr>
<td>Disease vs. crop yields</td>
<td>solution on mount.</td>
<td>. Vegetable crop</td>
</tr>
<tr>
<td>control cost vs.</td>
<td>C. Use pictures if necessary.</td>
<td>insect and disease</td>
</tr>
<tr>
<td>- returns</td>
<td></td>
<td>sheet.</td>
</tr>
<tr>
<td><strong>Discussion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disease vs. crop yields</td>
<td>A. List from reference the</td>
<td>Teacher evaluation of</td>
</tr>
<tr>
<td>control cost vs.</td>
<td>corn diseases available (row</td>
<td>collection for identifi-</td>
</tr>
<tr>
<td>- returns</td>
<td>crop of N.Y.S.)</td>
<td>cation.</td>
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<tr>
<td></td>
<td>B. Collect specimens of diseases</td>
<td></td>
</tr>
<tr>
<td></td>
<td>and compare with healthy one.</td>
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<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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</tr>
<tr>
<td><strong>Objective 4</strong></td>
<td>Collect and identify specimens of ten diseases of pasture (forage) crops.</td>
<td></td>
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<tr>
<td>Pasture Diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Ground stripe</td>
<td></td>
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<tr>
<td>- Anthracnose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Powdery mildew</td>
<td></td>
<td></td>
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<tr>
<td>- Ergot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Rust</td>
<td></td>
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<tr>
<td>- Smuts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Purple leaf spots</td>
<td></td>
<td>most grasses</td>
</tr>
<tr>
<td>- Scald</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Brown spot</td>
<td></td>
<td>orchard grass</td>
</tr>
<tr>
<td>- Bacterial blight</td>
<td></td>
<td>Broomegrass</td>
</tr>
<tr>
<td>- Eye spot - timothy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Net Blotch - Fescues</td>
<td></td>
<td></td>
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<tr>
<td>- Leaf spot</td>
<td></td>
<td>bluegrasses</td>
</tr>
<tr>
<td>- Leaf blotch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Bacterial wilt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Leaf spot</td>
<td></td>
<td>alfalfa</td>
</tr>
<tr>
<td>- Downey mildew</td>
<td></td>
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<tr>
<td><strong>Objective 5</strong></td>
<td>Collect and identify specimens of ten vegetable crop diseases.</td>
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<tr>
<td>Diseases</td>
<td></td>
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<tr>
<td>- Asparagus Rust</td>
<td></td>
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</tr>
<tr>
<td>- Anthracnose</td>
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<tr>
<td>- Bact. Blight</td>
<td></td>
<td>Beans</td>
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<tr>
<td>- Mosaic</td>
<td></td>
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<tr>
<td>- Dry root rot</td>
<td></td>
<td></td>
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<tr>
<td>- Downey mildew</td>
<td></td>
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<tr>
<td>- Black spot - beets</td>
<td></td>
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<tr>
<td>- Wires TEM</td>
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</tr>
<tr>
<td>- Blight</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Black leg</td>
<td></td>
<td>Cabbage, cauliflower, broccoli</td>
</tr>
<tr>
<td>- Fisaricum yellows</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Clubroot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Tip burn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Root knot nematode</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Black - heart - celery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Scab - cucurbits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Many others</td>
<td></td>
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</tr>
<tr>
<td><strong>Objective 6</strong></td>
<td>Develop a preventative program for one disease in each of objectives 2, 3, 4, and 5.</td>
<td></td>
</tr>
<tr>
<td>Disease selection and research</td>
<td></td>
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</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. List the diseases as discovered in references</td>
<td>Teacher evaluation of preservation and identification.</td>
</tr>
<tr>
<td>- Cornell recommends for field crops</td>
<td>B. Discuss diseases and their appearances.</td>
<td></td>
</tr>
<tr>
<td>- Approved practices in pasture management</td>
<td>C. Collect specimens and mount or preserve in liquid.</td>
<td></td>
</tr>
<tr>
<td>B. Discussion</td>
<td>D. Identify each using references</td>
<td></td>
</tr>
<tr>
<td>C. Field trip - supervised collection of specimens</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervised study using references</td>
<td>A. Compile a list of diseases from references, speakers, and farmers involved.</td>
<td>Evaluation of identification and preservation of specimens.</td>
</tr>
<tr>
<td>- Vegetable Diseases - 1034</td>
<td>B. Gather specimens and preserve in cellophane or jars.</td>
<td></td>
</tr>
<tr>
<td>- Cornell recommends for vegetable crops</td>
<td>C. Identify specimens.</td>
<td></td>
</tr>
<tr>
<td>B. Field trip to truck farms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Guest speaker - Extension agent spec. in vegetable crops</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Supervised study</td>
<td>A. Using references as in other objectives develop a prevention program for diseases selected.</td>
<td>Teacher evaluation of the program presented.</td>
</tr>
<tr>
<td>- Assist students in selection of diseases.</td>
<td>B. Orally, report on one of these.</td>
<td></td>
</tr>
<tr>
<td>- Let students list method of prevention of selected diseases</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Organize students and assist in preparing reports on one disease</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 1** Objective 7 | Disease selection and research  
Select the proper chemical control method for each of the diseases selected in objective 6. |
| **Unit 2** Safe use of machinery and chemicals.  
Objective 8 | Categories  
List and demonstrate 15 precautions to use when working with disease control chemicals. |
| Objective 9 | Fumigation  
Calibrate to the instructors satisfaction, a sprayer which will be used to apply a disease control chemical.  
Spray equipment  
- Hand operated - small  
- Machine operated - large  
- Aerial application |

Categories  
- Tractor operation  
- Calibration of equipment (residual effect)  
- Clothing  
- Labeling  
- Storage
### TEACHING METHODS

| A. Supervised study using references as in objectives 2, 3, 4, and 5 |
| B. Panel discussion - Mechanical vs. chemical control (select three students on each part) |
| C. Class discussion - lead around similarities of different controls |

### STUDENT APPLICATION ACTIVITIES

| A. Select and record the chemical methods suggested for use on selected diseases. |
| B. Panel discussion on uses of controls. |
| C. Prepare one similarity and one difference between methods of control for different plants. |

### EVALUATION PROCEDURES

| Teacher evaluation of methods of chemical control prepared. |

### EVALUATION PROCEDURES

- **A.** Teacher evaluation of student operation.
- **B.** Collect worksheets and evaluate.
- **C.** Written or oral exam on names of chemicals and identifying diseases these chemicals should be used to control.
- **D.** Write a plan for controlling five plant diseases on your farm this summer.

---

A. Demonstration of use of each type by custom operator, or farmer who uses this equipment.

B. Prepare a worksheet of steps to be used in operation.

C. Supervised practice.

- Teacher to assemble samples of poisons from chemical salesmen or stores. Empty containers with directions acceptable.

D. Get prices - discuss costs - number of applications - etc.

E. Demonstrate mixing of fungicide -

- Record in notebook the precautions to be used when using chemicals.

- Prepare a list of safe tractor operation rules, to be reviewed by instructor.

- Observation of demonstrations
- Question any poorly understood parts.

- Complete the worksheet
- Make a list of chemicals shown - note physical characteristics in notebook.

- Identify chemical with disease it will control.

- Study - labels on containers - note dilutions
- Learn to pronounce names - and spelling.

---

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9
RESOURCE MATERIALS

Books - "Approved Practices in Pasture Mgt."
   - Interstate, McVickar & McVickar

Bulletins - Southern Corn Leaf Blight
   Voc. Agric. Service - College of Agric., Univ. Ill. @ Urbana Champaign
   Cornell Recommends for Field Crops, N.Y.S. College of Agric.
   Open Door to Plenty - Natl. Agric. Chem. Assn.
      1145, 19th St. N.W., Wash. 6, D.C.
   IMS Sheets - Forage Crop - Veg. Crop Insect and Diseases (FFA Contest Forms)

   (also many other available from Mail inc.)
   Cornell Ext. Bull. 1034 - Veg. Diseases
   Cornell Recommends for Field Crops - N.Y.S. College Agric.

Audio-Visuels - Agric. Chem. Safety - Filmstrip and study guide -
   VEP, Calif. State, Poly. College, San-Luis-Obispo, Calif. 93401
Title: PLANT INSECT PEST CONTROL

DESCRIPTION:

Insects are an important part of our world's life cycle. They are usually classified as useful and harmful types, depending upon their use to man. If insects could carry on their life cycles unmolested, they would maintain their own natural equilibrium. The foods required by various insects range from decaying meats, blood and fecal matter, and other insects to plants. Their herbacious diets are of prime importance to man because of the great demand of foods used for human consumption. Many humans feel they cannot afford to sacrifice a portion of their food for the welfare of insect life. They, therefore, attack insects through the use of poisons called insecticides.

Students studying this module will be involved with the insect problems of their area, the means by which insects eat, and methods available for controlling the insects classified as pests.

Emphasis will be placed upon the recognition of insects, their means of feeding, and the methods used in controlling their populations and food consumption. The student will be involved with the use of insecticides and their applications. He will also be required to collect and identify specimens.

DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identifying Insects</td>
<td>Class 1 Other 6</td>
</tr>
<tr>
<td>2. Life Cycles of Insects</td>
<td>Class 0 Other 2</td>
</tr>
<tr>
<td>3. Feeding Methods of Insects</td>
<td>Class 1 Other 11</td>
</tr>
<tr>
<td>4. Controlling Insects</td>
<td>Class 0 Other 9</td>
</tr>
</tbody>
</table>

Revised 4/75
MODULE OF INSTRUCTION

Title - PLANT INSECT PEST CONTROL

OBJECTIVES to be obtained:

The student will be able to:

1. Make a list of no fewer than twenty-five insects found in the area, and segregate those which have been designated as destructful to crops. Develop an understanding of how insects affect crop yields and profits.

2. Recognize and identify the sections of the insect body, biting types, and sucking types of mouths, and the eye, antenna, wings, and legs of a given insect.

3. Identify through the use of a key, and pictures, five of the insects found harmful.

4. Draw and label the life cycles of the five insects used in objective 3 and three useful insects, of the student's choice.

5. Draw and label the chewing type mouth, and list ten insects which are of the chewing type.

6. Draw and label the sucking type mouth, and list ten insects which are of the sucking type.

7. Properly place eight of ten given insects into the proper category of chewing or sucking insects with use of a hand lens.

8. Collect and identify (with common names) 20 different insects. Collection may be pictures or drawings where live specimens can not be located.

9. List, step by step, the control method used for each of five destructive insects.

10. Develop a preventative program for the control of infestation of each of the insects in objective 9.

11. Select the proper chemical and time to control each of the insects in objective 9.

12. List and demonstrate 15 precautions to use when working with insecticides.

13. Calibrate, to the instructor's satisfaction a sprayer which will be used to apply an insecticide.

14. Develop a plan for controlling five insects on your farm this summer.
## OBJECTIVES BY UNIT

### Unit 1 - Identifying Insects

#### Objective 1 -
Make a list of no fewer than twenty-five insects found in the area, and segregate those which have been designated as destructive to crops. Develop an understanding of how insects affect crop yields and profits.

#### Objective 2 -
Recognize and identify the sections of the insect body, biting types, and sucking types of mouths, and the eye, antenna, wings, and legs of a given insect.

#### Objective 3 -
Identify through the use of a key, and pictures, five of the insects found harmful.

### CONTENT

#### A. IMS Cornell
- List of Vegetable Crop Insects
- List of Forage Insects
  (These sheets used in State Fair FFA Contests)

#### A. Body parts
- Head
- Thorax
- Abdomen
- Compound eye
- Antenna

#### A. Insects harmful to crops
- Japanese beetle
- Southern root worm
- European corn borer
- Wire worm
- Cut worm
- Leaf hopper
- Many others - see two IMS Sheets used at State Fair - F.F.A. Competition
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<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture-Importance of Insect Control Supervised study</td>
<td>Using IMS Sheets check off insects known to be a problem on your farm.</td>
<td>Teacher evaluation of compiled list - each pupil checks off.</td>
</tr>
<tr>
<td>Lecture Supervised study</td>
<td>List body parts in notebook Draw and label an insect's body</td>
<td>Test Label the parts of the body when presented with a drawing of an insect.</td>
</tr>
<tr>
<td>Guest Speaker Coop. Extension specialist in Entomology Supervised study</td>
<td>Select and cut out pictures of examples of insects causing destruction to crops. Note for record information discussed by speakers. Use opaque projector to identify pictures. Handle riker mounts and specimen in groups. Encourage individual study.</td>
<td>Identification quiz either pictures or actual specimen Use IMS - Sheets for quiz. Set up IMS Forage Crops Ident. Contest - on Vegetable Crop - Insect Ident. Contest Sheet</td>
</tr>
</tbody>
</table>

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## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 2</th>
<th>Life Cycles of Insects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 4</td>
<td>Draw and label the life cycles of the five insects used in objective 3 and three useful insects, of the student's choice.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 3</th>
<th>Feeding Methods of Insects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 5</td>
<td>Draw and label the chewing type mouth, and list ten insects which are of the chewing type.</td>
</tr>
<tr>
<td>Objective 6</td>
<td>Draw and label the sucking type mouth, and list ten insects which are of the sucking type.</td>
</tr>
</tbody>
</table>

## CONTENT

**Ex. of one**

**Hessian Fly**

- Adult - August - Sept.
- June - July
- Pupae
- Nov. - March
- Egg - and
- September
- May - Sept. - October
- Found in stem
- Straw and old stem

- Clypeus
- Labrum
- Maxillae
- Maxillary palp
- Labium
- Palpi
- Hypopharynx
- Palpifer
- Mandibles
- Galea
- Maxillary palp
- Labella
- Hypopharynx
- Labium
- Salivary duct
- Food channel
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<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervised Study</td>
<td>Draw label and file life-cycles of the insects being considered</td>
<td>Teacher evaluation of drawings and labels</td>
</tr>
<tr>
<td>Explain periods of life</td>
<td></td>
<td></td>
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<tr>
<td>cycles and over-wintering</td>
<td></td>
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<tr>
<td>Lecture</td>
<td>. Draw and label the chewing type of insect mouth</td>
<td>Teacher evaluation of drawings, labels and lists</td>
</tr>
<tr>
<td>Supervised study of the</td>
<td>. Identify with hand lens each part labeled</td>
<td>Evaluate students ability to recognize parts of real insect</td>
</tr>
<tr>
<td>mouth using hand lens and</td>
<td></td>
<td></td>
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<tr>
<td>real examples</td>
<td></td>
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<tr>
<td>Supervised study of the</td>
<td>. Draw and label the sucking type of insect mouth</td>
<td></td>
</tr>
<tr>
<td>mouth using hand lens and</td>
<td>. Identify with hand lens each part labeled</td>
<td></td>
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<tr>
<td>real example</td>
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</table>

Teacher evaluation of drawing, labels, and lists. Evaluate students ability to recognize parts on a real insect.
<table>
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<th>OBJECTIVES BY UNIT</th>
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</thead>
<tbody>
<tr>
<td>Objective 7</td>
<td></td>
</tr>
<tr>
<td>Properly place eight of ten given insects into the proper category of chewing or sucking insects with use of a hand lens.</td>
<td>Ten insects selected by instructor</td>
</tr>
<tr>
<td></td>
<td>Five chewing type mouth</td>
</tr>
<tr>
<td></td>
<td>Five sucking type mouth</td>
</tr>
<tr>
<td>Objective 8</td>
<td></td>
</tr>
<tr>
<td>Collect and identify (with common names) 20 different insects.</td>
<td>Needed: net</td>
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<tr>
<td></td>
<td>Cyanide bottle (kill jar)</td>
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<td></td>
<td>pins</td>
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<td></td>
<td>Cigar box</td>
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<td>Mothballs</td>
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<tr>
<td>Objective 9</td>
<td>Unit 4 - Controlling Insects</td>
</tr>
<tr>
<td></td>
<td>Objective 9</td>
</tr>
<tr>
<td>List step by step, the control method used for each of five destructive insects.</td>
<td>A. Physical controls</td>
</tr>
<tr>
<td></td>
<td>B. Chemical controls</td>
</tr>
<tr>
<td></td>
<td>C. Different feeding habits of sucking type and chewing type insects.</td>
</tr>
<tr>
<td>Objective 10</td>
<td></td>
</tr>
<tr>
<td>Develop a preventative program for the control of infestation of each of the insects in objective 9.</td>
<td>A. State of life cycle easiest to combat</td>
</tr>
<tr>
<td></td>
<td>B. Determination of easiest method of prevention</td>
</tr>
<tr>
<td></td>
<td>C. Success of previous uses</td>
</tr>
<tr>
<td></td>
<td>D. Time to apply prevention</td>
</tr>
</tbody>
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## PLANT INSECT PEST CONTROL

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<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervised study</td>
<td>Use notes from previous objectives to practice differentiation of the two mouth types.</td>
<td>Test</td>
</tr>
<tr>
<td>Laboratory exercise</td>
<td>Capture and mount 20 different insects from field trip and on students own time</td>
<td>Recognize and categorize eight of the ten given insects for mouth types.</td>
</tr>
<tr>
<td>Field trip and supervised study</td>
<td>Select five destructive insects and list the methods of control which may be used on each.</td>
<td>Teacher evaluation of specimen collection</td>
</tr>
<tr>
<td>capture, killing and mounting through thorax</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervised identification</td>
<td></td>
<td>Teacher evaluation of lists compiled by students.</td>
</tr>
<tr>
<td>Field trip to farms using insect controls.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervised study</td>
<td>Outline a program for the prevention of insect infestation for the five insects in objective 9.</td>
<td>Teacher evaluation of the outline.</td>
</tr>
<tr>
<td>Guest Speaker from a chemical company selling insecticides (specialist)</td>
<td>Make a list of chemicals shown Tell if chemical is used as a dust - a liquid - or - granule. Identify - chemicals with insects it will control. Study label on container - become familiar with nature of chemical. Note - dilutions on directions.</td>
<td>Written test on different chemicals which can be used to control five insects. Check on students knowledge of dilution procedures.</td>
</tr>
</tbody>
</table>

### EVALUATION PROCEDURES

- Test
- Recognize and categorize eight of the ten given insects for mouth types.
- Teacher evaluation of specimen collection
- Teacher evaluation of lists compiled by students.
- Teacher evaluation of the outline.
- Written test on different chemicals which can be used to control five insects.
- Check on students knowledge of dilution procedures.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 11       | Eating habits of insect  
| Select the proper chemical and time  
| to control each of the insects in  
| objective 9.  
|                     | Time of year  
|                     | Stage of life cycle  
|                     | Degree of infestation  
|                     | Chemicals available |
| Objective 12       | Categories  
| List and demonstrate 15 precautions  
| to use when working with insecti-  
| cides.  
|                     | A. Tractor operation  
|                     | B. Calibration of equipment (residual effect)  
|                     | C. Clothing  
|                     | D. Labeling  
|                     | E. Storage |
| Objective 13       | Fumigation  
| Calibrate, to the instructor's  
| satisfaction a sprayer which will  
| be used to apply an insecticide.  
|                     | Spray equipment  
|                     | Fogging Equipment |
| Objective 14       | Insecticides available  
| Develop a plan for controlling  
| five insects on your farm this  
| summer.  
|                     | dilution charts  
|                     | directions on package  
|                     | choice of sprayer  
|                     | and sprayer tips.  
<p>|                     | Aerial equipment |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervised study</td>
<td>List the insect and note the proper time, stage of life cycle and chemical control advised to use.</td>
<td>Teacher evaluation of control method and list.</td>
</tr>
<tr>
<td>Supervised study</td>
<td>Demonstration using equipment to apply insecticides</td>
<td>Record in notebook the precautions to be used when using chemicals.</td>
</tr>
<tr>
<td>Laboratory exercises</td>
<td>Review discussion, safe tractor operation.</td>
<td>Prepare a list of safe tractor operation rules to be reviewed by instructor.</td>
</tr>
<tr>
<td>A. Demonstration of use of each type by custom spray operator or farmer who uses this equipment</td>
<td>Observation of demonstration. Question any poorly understood parts. Complete the worksheet on calibration. Make list of 10 insecticides with insect and crop related to each.</td>
<td>Oral or written exam 15 precautions when using agricultural chemicals.</td>
</tr>
<tr>
<td>B. Prepare a worksheet of steps to be used in operation</td>
<td></td>
<td>Written exam on calibration of chemicals. Teacher evaluation of student operation. Collect worksheets and evaluate.</td>
</tr>
<tr>
<td>C. Demonstration by teacher - Calibrate sprayer - note PSI nozzles gallons/acre.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Show samples of at least 10 insecticides. Demonstrate how each is used.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Stress safety during demonstrations using chemicals.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem solving</td>
<td>Determine how much insecticide to use with a gallon of water on given acres of a specific crop to cover a specific insect.</td>
<td>Write a plan for controlling five insects on your farm this summer.</td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - PLANT INSECT PEST CONTROL
Code - 01.010208-02

RESOURCE MATERIALS

Books - Destructive and Useful Insects, Metcalf and Flint, McGraw-Hill

3. Cornell Ext. Bull. 1082, Disease and insect control in the home orchard
5. U.S.D.A. Bull. 2040, Control of potato insects
6. Cornell Recommends for field crops and vegetable crops
9. G 12 - I.M.S. Cornell University, Stone Hall
10. Corn Insects - Vocational Agriculture Service University Illinois - Urbana, Illinois
11. Know Your Insects 4-H Members Guide M-6-1 New York State College of Agriculture
12. Forage Crops Contest Sheet - Insects Diseases (FFA Contest Forms) Vegetable Crops Contest Sheet Insects Diseases (FFA Contest Forms)
- Stored grain insects, household pests - corn insects -
- small grain insects - legume insects, vegetable insects and fruit insects.

Visuals: Movies from Cornell University - Agriculture College Film Library

- The Monarch Butterfly Story - 11 min color
- Protecting Stored Grains from Destructive Pests 12 min. color
- Spittlebug and Its Control - 16 min. Color
- Battle of the Bugs - 11 min color
- European Corn Borer - 10 min color
- 500,000 to 1 - 21 min color

Supply Source for entomology equipment

Welch Scientific Co.
331 East 38th Street
New York 16, New York 654

Ward's Natural Science Establishment Incorporation
P.O. Box 1712
Rochester, New York 14603
Like all modern business enterprises, the farm enterprise must keep accurate records of all aspects of its business. Records should be kept on all labor needs, machinery used, cost per acre of each crop, inventory, and production. These are essential when analyzing the business, preparing income tax forms, asking for credit at a bank, or making future farm decisions. The students will be involved in farm business record activities in this module.

1. Needs and uses of records
   - Class: 1
   - Other: 0
2. Records that should be kept by each farm
   - Class: 1
   - Other: 0
3. Modern business forms used in the farm business
   - Class: 2
   - Other: 26
   - Total: 48

Revised June, 1975
MODULE OF INSTRUCTION

Title - Farm Business Records

OBJECTIVES to be obtained:

The student will be able to:

1. List six (6) reasons for keeping records.

2. List five (5) types of necessary records that should be kept in order to successfully operate a modern farm business.

3. Calculate depreciation, correctly enter the data in a Farm Inventory Book and calculate the net worth, using class references and given inventory data.

4. Correctly place and summarize the data in a Farm Cash Account Booklet, given a cash account book and necessary record data on a modern farm.

5. Correctly set up Farm Machinery and Equipment Operating and Maintenance Records, given the necessary forms and record data.

6. Correctly enter and summarize the data in the Production Record Forms, given the necessary record forms and data.

7. Correctly record the data in a Crop Record Book, given the necessary forms and crop data.

8. Correctly record the data in a Labor Record Book, given labor data.
## Objectives by Unit

<table>
<thead>
<tr>
<th>Unit 1: The need and uses of farm records</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1</td>
</tr>
<tr>
<td>List six (6) reasons for keeping records.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 2: Records that should be kept by each farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 2</td>
</tr>
<tr>
<td>List five (5) types of necessary records that should be kept on a modern farm business.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 3: Modern business forms used in the farm businesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 3</td>
</tr>
<tr>
<td>Calculate depreciation, correctly enter the data in a farm inventory book, and calculate the net worth, using class references and given inventory data.</td>
</tr>
</tbody>
</table>

## Content

### A. Reasons for Keeping Records
- Profit or loss
- Business analysis and future decisions
- Income tax
- Maintain credit rating
- Insurance claims (Fire and Theft)
- Settling estates
- Identifying lost animals and machinery
- Personal satisfaction
- Profit sharing
- Proof of payment

### A. Types of Records
- Cash account
- Inventory
- Machinery operation and maintenance
- Production
  - animal
  - crop
  - Labor

### A. Farm Inventory
- Purposes of a farm inventory (using reference bulletin #5 and reference book #2 for the student)
  - list of what is owed and what is owned
  - includes all property and debts
  - shows net worth
  - How to make entries correctly
    - description
    - year bought
    - cost
    - years of life
    - depreciation
      - how to figure depreciation
        - straight line
        - sum of the digits
        - declining balance
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>A. To recognize the need for keeping records</td>
<td>A. Oral or written test</td>
</tr>
<tr>
<td>B. Resource people to class to speak on the importance of keeping records. Banker, Production Credit Manager, Extension Agent; Key Farmers, Insurance Company Representatives.</td>
<td>· Discussion-ask questions of resource person</td>
<td></td>
</tr>
<tr>
<td></td>
<td>· Stress overall value of records</td>
<td>· List six (6) needs for records</td>
</tr>
<tr>
<td></td>
<td>· Students set up individual and group work experience projects in crops &amp; livestock enterprises. Keep Cost Account Records on all projects.</td>
<td>· Students may receive credit for completing records relating to objective 1.</td>
</tr>
<tr>
<td>A. Discussion</td>
<td>A. Look over the different record forms</td>
<td>A. Oral or written test</td>
</tr>
<tr>
<td>B. Actual record forms</td>
<td>B. Award prizes for the best records kept by students at the annual Parent/Member Banquet or other similar activity conducted by the FFA or any Youth Leadership group in the school.</td>
<td></td>
</tr>
<tr>
<td>C. Use student committees to report on various types of records.</td>
<td>A. Teacher prepare a list of information to be placed in the inventory booklet in the specified areas and/or</td>
<td></td>
</tr>
<tr>
<td>D. Use student panel to compare types of records.</td>
<td>B. Visit a cooperating farmer and have students obtain information about his business in their inventory books and finish calculation in the school laboratory.</td>
<td></td>
</tr>
<tr>
<td>A. Exercise: relating given data to inventory record book and/or</td>
<td>C. Use a home farm and complete the objectives at Unit 2.</td>
<td></td>
</tr>
<tr>
<td>B. Field trip (taking inventory of a small cooperating farm) and/or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Independent study</td>
<td></td>
<td>A. Teacher evaluation:</td>
</tr>
<tr>
<td>D. Let student use own data where possible.</td>
<td></td>
<td>· Completion of the individualized instruction book on Farm Inventory published by Cornell University</td>
</tr>
</tbody>
</table>

658
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cattle</td>
</tr>
<tr>
<td></td>
<td>Other livestock</td>
</tr>
<tr>
<td></td>
<td>Food and supplies</td>
</tr>
<tr>
<td></td>
<td>how to compute grain and silage qualities</td>
</tr>
<tr>
<td></td>
<td>Farm real estate</td>
</tr>
<tr>
<td></td>
<td>Land and buildings</td>
</tr>
<tr>
<td></td>
<td>Other property</td>
</tr>
<tr>
<td></td>
<td>Long and short term liabilities</td>
</tr>
<tr>
<td></td>
<td>Other assets</td>
</tr>
<tr>
<td></td>
<td>Net worth</td>
</tr>
</tbody>
</table>

659
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>660</td>
</tr>
</tbody>
</table>
### Unit 3

#### Objective 4:
Correctly place and summarize the data in a Farm Cash Account Booklet, given a Cash Account Book and necessary record data on a modern farm.

#### A. Cash Account Book
- **Purposes**
  - total receipts
  - total expenses
  - farm wages
  - principal payments
  - interest payments
  - new machines and equipment
  - real estate improvements
  - livestock bought
- **How to make entries correctly**
  - date
  - size and quantity
  - description
  - cost
  - column
- **Special types of entries**
  - receipt entries
  - summarization
  - increase and decrease in inventory
  - unpaid family labor
  - farm income

#### Objective 5:
Correctly set up Farm Machinery and Equipment Operating and Maintenance records, given the necessary forms and record data.

#### A. Machinery Maintenance Records
- **Purpose**
  - to schedule maintenance of machinery
  - record of repair and maintenance cost and cost of individual equipment.
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Take given data and apply it to a Cash Account Book provided by the teacher.</td>
<td>A. Students make all entries in the cash account books under instructor's supervision.</td>
</tr>
<tr>
<td>B. Demonstration and/or</td>
<td>B. Visit a cooperating farmer to collect data for Cash Account Book and/or have the farmer come to class for the presentation</td>
<td>B. Special credit given for completing records on the home farm or cooperative farm.</td>
</tr>
<tr>
<td>C. Field trip</td>
<td>C. Students keep cash account records on home farm.</td>
<td></td>
</tr>
<tr>
<td>D. Let student use own data where possible</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Lab studies on cash account books. Students work informally in groups of 2-3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Bring in resource personnel to discuss maintenance requirements and cost repairs.</td>
<td>A. Students take given data prepared in class and apply it to a Machinery Maintenance and Repair Form.</td>
<td></td>
</tr>
<tr>
<td>B. Class discussion on what things should be included in the check list.</td>
<td>B. Spend a day at a local or area farm machinery dealer-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ship to discuss the value of method used to keep farm machinery and equipment records.</td>
<td></td>
</tr>
</tbody>
</table>
| | | A. Given adequate data, students can make a decision on when to replace or trade equipment.
## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What equipment should be included?</strong></td>
</tr>
<tr>
<td><strong>What maintenance check should be included?</strong></td>
</tr>
<tr>
<td><strong>Length of life</strong></td>
</tr>
<tr>
<td><strong>Condition when traded in</strong></td>
</tr>
<tr>
<td><strong>Time lost for repairs</strong></td>
</tr>
<tr>
<td><strong>Cost per hour</strong></td>
</tr>
<tr>
<td><strong>Decide when to replace machinery and equipment</strong></td>
</tr>
</tbody>
</table>

### Unit 3

**Objective 6:**
Correctly enter and summarize the data in the Production Record Forms, given the necessary record forms and data.

### A. Production Records
- Used to determine:
  - total production per animal
  - total production per man
  - size of business
  - man equivalent
  - labor efficiency
  - basis for culling
  - selection of foundation animals
- Basic types of entries:
  - original cost
  - feed consumed
  - veterinary and medicine expenses
  - breeding fees
  - supplies
  - labor
  - other
  - number and size of offspring

### B. Dairy Records
- Kinds:
  - days milked
  - pounds of milk per day
  - total pounds of milk (how to figure)
  - test
  - pounds of butterfat (how to figure)
  - price
  - value of milk (how to figure)
  - pounds of roughage
  - pounds of grain
  - cost of feed
  - return above feed cost
  - other necessary data connected with the individual cow record
- total herd production
  - pounds of milk sold per cow
  - pounds of milk sold per man
  - calculate the percent of feed cost to milk receipts per cow.
<table>
<thead>
<tr>
<th><strong>TEACHING METHODS</strong></th>
<th><strong>STUDENT APPLICATION ACTIVITIES</strong></th>
<th><strong>EVALUATION PROCEDURES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Gather several maintenance records and cost repairs records from area farmer.</td>
<td>A. Take given data from the instructor and/or from other records provided and apply it to a Livestock and Dairy Record Form provided by the instructor.</td>
<td>A. Students make all entries in the Livestock and Dairy Record Forms.</td>
</tr>
<tr>
<td>A. Instructor illustrates how to place entries on Livestock Record and Dairy Record. Look over records provided by cooperating farmer.</td>
<td></td>
<td>B. Students identify the weak and strong points in a given farm's dairy and crop program.</td>
</tr>
<tr>
<td>B. DHIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Owner sampler</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Let student use own data where possible.</td>
<td></td>
<td>C. Oral and written test on Farm Business Analysis Factors.</td>
</tr>
</tbody>
</table>
### Objectives by Unit

#### Unit 3

**Objective 7:**
Correctly record the data in a Crop Record Book, given the necessary forms and crop data.

<table>
<thead>
<tr>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. <strong>Field Crop Records</strong></td>
</tr>
</tbody>
</table>
| ```
| **Purpose** |
| - field identification (number of acres and location) |
| - planting data |
| - fertilization data |
| - harvest data |
| - spray and dust data |
| - other data |
| - value of crops |
| - summarization |
| - income over expenses |
| ``` |

**Unit 3**

**Objective 8:**
Correctly record the data in a Labor Record Book, given labor data.

<table>
<thead>
<tr>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. <strong>Purpose of labor records</strong> (using reference book #4 and reference bulletin #6, 7 and 8 for student)</td>
</tr>
</tbody>
</table>
| ```
| - Income tax |
| - Social security |
| - Labor efficiency |
| - Man work units |
| ``` |

<table>
<thead>
<tr>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. <strong>Employer s responsibility</strong></td>
</tr>
</tbody>
</table>
| ```
| - Insurance |
| - Written agreement |
| - Social security number |
| - Record for income tax expenditure |
| - Record for paying social security for the employer, employee and withholding taxes. |
| - Part time |
| - Piece work |
| ``` |
### TEACHING METHODS

| A. Lecture and demonstration |
| B. Supervised study |
| C. Independent study |
| D. Look over Crop Record Sheets provided by cooperating farmer. |
| E. Use a school crop demonstration project 1 to 5 acres of field corn for grain or silage. |
| F. Use one or two demonstrations or individual projects on the home or cooperative farms. |

### STUDENT APPLICATION ACTIVITIES

| A. Take given data from instructor and/or other forms, and apply it to Crop Record Forms provided by the instructor. |
| B. Set up and carry out the entire crop demonstration planning, growing, harvesting and marketing the crop under the supervision of the teacher and resource people in the community. |

### EVALUATION PROCEDURES

| A. Teacher evaluation of students' ability to make entries correctly on the Crop Record Form. |
| B. Keep complete cost records on their crop demonstration projects. |

| A. Take given data from instructor and apply it to a labor form. Figure employer and employees share of Social Securities. Compute withholding taxes and apply them to W2 Forms. |

| A. Teacher evaluation of students' ability to make entries in the Labor Forms and fill out a W2 Form. |
Title - Farm Business Records

Code - 01.010401-01

RESOURCE MATERIALS

Books: Teacher references
1. The Farm Management Handbook - Halland and Mortensin (Interstate)
2. Profitable Farm Management - Hamilton and Bryant (Prentice Hall)
3. Farm Management Guide - Doane's - St. Louis, Missouri 63141

Books: Student references
3. Field and Crop Record - Dept. of Agronomy Agr. Edu. Division, Cornell
4. Farm Business Record - Dept. of Ag. Economics, Cornell

Bulletins: Teacher references
2. Problems for Use in Teaching the Cornell Farm Account Book - Part I Simple entries
   Part II Suggested ways for making entries - A,E. Ext. 155
4. Farmers Tax Guide - District Office, Internal Revenue Service (teaching kit)
5. Field Crops - Cost and Returns - A,E. Res. 308

Bulletins: Student references
1. Simple Entry Illustration in the Cornell Farm Account Book for use of farm families keeping records - E,E. Ext. 105
3. Itemized Record of a New York State Dairy Farm Business - A,E. Ext. 20
4. Taking the Farm Inventory - A program unit of instruction, College of Agr.
   CP - 5M
5. Itemized Record of a Farm Business - Ag. Econ. Ext. 95
6. Your Social Security Payments - OAS130
7. Farm People and Social Security - OAS 125F
8. Cornell Farm Employee Wages Record - College of Agr., Cornell Univ., 5M-W
The modern farmer, like other businessmen, needs accurate records in order to be competitive in his field.

The importance of recordkeeping will be stressed as it relates to livestock performance. Students will chart and compare growth, breeding, production, and health records needed to meet the selection of outstanding individual animals could be made.

Emphasis will be placed on keeping accurate records in such areas as milk production, breeding, egg production, litter size, and efficiency of converting feed into usable product.

<table>
<thead>
<tr>
<th>Major Divisions or Units of Content</th>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. The importance of keeping livestock growth, production, breeding, and health records</td>
<td>3</td>
</tr>
<tr>
<td>2. Utilizing growth records on growing animals</td>
<td>3</td>
</tr>
<tr>
<td>3. Calculating lactation curves</td>
<td>2</td>
</tr>
<tr>
<td>4. Efficiency of feed conversion</td>
<td>3</td>
</tr>
<tr>
<td>5. Using parent-progeny information</td>
<td>4</td>
</tr>
<tr>
<td>6. Calculating Conception Rate</td>
<td>2</td>
</tr>
<tr>
<td>7. Using the herd health record</td>
<td>2</td>
</tr>
<tr>
<td>8. Analyzing Production Records</td>
<td>3</td>
</tr>
<tr>
<td>9. Importance of Accuracy in Keeping Records</td>
<td>$\frac{1}{23}$</td>
</tr>
</tbody>
</table>

Revised June '74
OBJECTIVES to be obtained:

The student will be able to:

1. List 5 reasons each for keeping growth, breeding, production, mortality and health records.

2. Determine the weight of 10 growing animals of his choice, record weights, construct and analyze a bar graph of his findings.

3. Given a dairy record, the student will chart lactation curves on five animals.

4. Calculate and analyze the efficiency of feed conversion on 10 animals.

5. Using a comprehensive dairy beef or swine record the student will calculate and analyze parent-progeny differences on 5 pairs of animals.

6. Using a sample breeding record the student will calculate the conception rate of the dairy (or other) livestock to the nearest percent.

7. Use a herd health record to identify 5 animals who are conspicuous in their poor health. He will estimate dollar costs in veterinary fees and lost production on 5 unhealthy animals.

8. Use a comprehensive production record to select 5 dairy, beef, sheep, swine or poultry animals for culling, and 5 for selected foundation or breeding purposes.

9. List 2 reasons for keeping accurate records for each major record studied.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 1 - The importance of keeping livestock growth, production, breeding and health records**<br>Objective #1<br>List 5 reasons each for keeping growth, breeding, production, mortality, and health records. | **A. For dairy production students will keep milk production records, breeding records, herd health records and feeding records on the home farm or cooperative farm for 12 months.**<br>. Students will use this information for culling and determining herd replacements for the farm  
**B. For beef, hogs and sheep students will keep herd health records, feed conversion and breeding records.**<br>**C. For poultry the students will keep records on mortality, feed conversion and egg production.** |
| **Unit 2 - Utilizing Growth Records on Growing Animals**<br>Objective #2<br>Determine the weight of 10 growing animals of his choice, record weights, construct and analyze a bar graph of his findings. | **A. Students will tape or weigh the various classes of livestock that are being studied in class.**<br>**B. The animals will be weighed at specific intervals that will be determined by the teacher, student and farmer.**<br>**C. Students will record all data so that this information could be used to construct bar graphs during lab periods.** |
### TEACHING METHODS

<table>
<thead>
<tr>
<th>A. Classroom chalk and board</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Illustration of each record on overhead transparency.</td>
</tr>
<tr>
<td>C. Examine various records from key adult farmers in the different enterprises.</td>
</tr>
<tr>
<td>D. Field trips to farms at which time the importance of records will be discussed by the farmer and students.</td>
</tr>
<tr>
<td>E. Visiting veterinarian invited to discuss the importance of records and how they relate to herd health problems.</td>
</tr>
<tr>
<td>F. Feed company fieldmen invited to class to discuss the importance of keeping livestock records.</td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

| A. Students will use these records for their work experience programs. |
| B. Students could use data studied to exemplify leadership by implementing desirable changes in farm management on the home farm and on cooperative farms. |
| C. Students could receive direct credit for complete records used in any enterprise for leadership training contest in livestock production and dairy production on the local, district, and state FFA levels. |
| D. Students will orally state the value of good records and how this information could be used in farm management. The reasons must be acceptable to the instructor. |

### EVALUATION PROCEDURES

| A. Teacher will check on the records of each student and grade the records for marking purposes. |
| B. Records will be checked for accuracy, neatness and validity. |
| C. Students will list 3 of the 5 reasons for keeping records. |
| D. Students will orally state the value of good records and how this information could be used in farm management. The reasons must be acceptable to the instructor. |

### Additional Activities

| A. Field trips to local farms to discuss the importance of weight gains and to demonstrate how to weigh or tape animals to determine weight gains. |
| B. Overhead transparency to illustrate poor conversions and excellent feed conversion. |
| C. Use posters to display work of students bar graphs in all classes of livestock. |
| D. Use feed company personnel to discuss feed efficiency and how production rates are influenced by quality feeds. |

### Additional Activities

| A. Student committees will find the value of current feed materials forage of different quality and concentrates. |
| B. Another student committee (smaller group) will find the current value of product. |
| C. Students should individually calculate total cost of feed stuffs consumed (from a given record) and total value of product. |
| D. Students should use a formula for efficiency of feed conversion (some variation of value of product divided by cost of feed) to calculate the efficiency of 10 animals. |
| E. The students will discuss the meaning of the feed efficiency information found. |

<p>| A. The teacher will listen to committee reports and comment on the reports. The teacher will determine accuracy of student calculations and assist students in the analysis of data. Determine student grades by input provided and accuracy of comments on the reports. Oral grades. |
| B. Given several sets of completed records students will calculate feed conversion efficiency and make comparisons regarding the various classes of livestock. |</p>
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 3 - Calculating Lactation Curves** | A. Lactation Curve Construction  
B. Interpretation of Lactation Curves |
| Objective 3  
Given a dairy record, the student will chart lactation curves on 5 animals. | |
| **Unit 4 - Efficiency of Feed Conversion** | A. Determining feed costs  
B. Value of product  
C. Feed conversion formulas  
D. Need for accurate records |
| Objective 4  
Calculate and analyze the efficiency of feed conversion on 10 animals. | |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>A. Students could use corrective breeding to improve quality of livestock and persistency in milk production.</td>
<td>A. The student should explain in paragraph form, the importance of records to progeny testing.</td>
</tr>
<tr>
<td>B. Teacher example or demonstration</td>
<td>B. The student should calculate parent-progeny difference on 5 sets of dairy (or beef, swine, sheep, poultry) animals. The student should rank the animals from best to poorest increase in production.</td>
<td>B. The teacher should check calculations for accuracy. Teacher should check to see how students have used this knowledge on their farms.</td>
</tr>
<tr>
<td>C. Invite AI personnel to discuss breeding programs that will improve desirable lactation curves.</td>
<td>C. Students can use these records for future sales of their livestock.</td>
<td>Direct application.</td>
</tr>
<tr>
<td>A. Discussion and visuals</td>
<td>A. Students should determine feed conversion and efficiency factors of the home farm livestock.</td>
<td></td>
</tr>
<tr>
<td>B. Make an analysis of DHIA records for income over feed costs.</td>
<td>B. Calculate feed conversion of student's animals units used in their supervised work experience programs.</td>
<td></td>
</tr>
<tr>
<td>C. Use beef and hog feed conversion records to illustrate margins of income over feed cost using current feed prices.</td>
<td></td>
<td>A. The teacher will construct a written test on feed efficiency for the various classes of livestock. Students will study all data and determine the efficiency of the classes of livestock ranking the classes or groups excellent, good, fair, and poor. The instructor could develop an evaluation for Objective 4.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B. Evaluate student supervised work experience records as they relate to efficiency factors.</td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
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</tbody>
</table>
| **Unit 5 - Using Parent-Progeny Information** | A. Using progeny records for evaluation of desirable characteristics.  
B. List the weak and strong points of each pair of animals.  
C. The importance of selecting good breeding stock  
D. Progeny performance for culling  
E. The importance of accurate current records. |
| Objective #5  
Using a comprehensive dairy, beef, or swine record the student will calculate and analyze parent-progeny differences on 5 pair of animals. | |
| **Unit 6 - Calculating Conception Rate** | A. Calculating conception rates  
B. Factors affecting conception  
C. The importance of maintaining desirable calving, lambing and farrowing intervals.  
D. The economics of healthy breeding stock |
| Objective #6  
Using a sample breeding record the student will calculate the conception rate of the dairy herd (or other) livestock to the nearest percent. | |
### TEACHING METHODS

| A. DHIA supervisor used to discuss dairy records and production. |
| B. Outstanding dairy or beef breeder used to describe his breeding programs and record system. |
| C. Classroom discussion |
| D. Field trip or lab session to observe a classifier work |
| E. Invite a representative from pro-genetics, Ithaca, N.Y. to speak to the class on corrective breeding. |

### STUDENT APPLICATION ACTIVITIES

| A. Students use information to select their own stock for projects. |
| B. Students attend 4-H, FFA and Tri-Co. Holstein shows on rattle judging to learn more about selection and judging. |
| C. Attend any livestock seminars conducted by the various breed associations beef, sheep, and hogs. |

### EVALUATION PROCEDURES

| A. Given specific data on performance and progeny the student will evaluate records and data and select the superior animals. |
| B. The student will list the reasons for his selections to the satisfaction of the instructor. |

A. Given specific data on sample herds students will calculate the percent of conception rates at different farms. The teacher will evaluate the answers.

B. Written test - essay question on factors that cause poor conception rates. Explain what farmers could do to correct problems of poor conception.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 7 - Using the herd health records</td>
<td>A. Culling</td>
</tr>
<tr>
<td>Objective #7</td>
<td>B. Selection of Sires</td>
</tr>
<tr>
<td>Use a herd health record to identify 5 animals who are conspicuous in their poor health.</td>
<td>C. Review programmed herd health</td>
</tr>
<tr>
<td></td>
<td>D. Anticipating health problems</td>
</tr>
<tr>
<td></td>
<td>E. Veterinarian and medicine costs</td>
</tr>
<tr>
<td></td>
<td>F. Lost production due to poor health</td>
</tr>
<tr>
<td></td>
<td>A. Conversion of actual records for comparison of individuals</td>
</tr>
<tr>
<td></td>
<td>B. Selection of cull animals based on production or other herd health problems</td>
</tr>
<tr>
<td></td>
<td>C. Using records to select foundation or breeding stock</td>
</tr>
<tr>
<td></td>
<td>D. The need for accurate records</td>
</tr>
<tr>
<td></td>
<td>A. Review of need for accurate records</td>
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<tr>
<td></td>
<td>(accuracy of records should be stressed throughout the module)</td>
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<tr>
<td></td>
<td>B. Types of records</td>
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<tr>
<td></td>
<td>. Milk production</td>
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<tr>
<td></td>
<td>. Feed conversion</td>
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<tr>
<td></td>
<td>. Health</td>
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<td>. Mortality</td>
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<td>. Breeding</td>
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<td>676</td>
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<td>10</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>A. Class Discussion</td>
<td>A. The student should enter in his notes the usefulness of herd health records in culling, selection of sires, and anticipating health problems. The students should prepare questions in advance regarding programmed herd health, records, and health problems.</td>
</tr>
<tr>
<td>B. Slides showing healthy and unthrifty animals</td>
<td>B. The student should select 5 animals with a serious health problem from a comprehensive health record.</td>
</tr>
<tr>
<td>C. Guest resource person local veterinarian</td>
<td>C. The student should estimate dollar costs in veterinarian fees and lost production on the 5 animals.</td>
</tr>
<tr>
<td>D. Problem solving - Identify cause factors for unthrifty animals. Discuss preventative controls.</td>
<td>A. The student should become familiar, through practice, with the calculations involved in converting production records for maturity and length of lactation and times milked (for dairy only).</td>
</tr>
<tr>
<td></td>
<td>B. The student should select 5 animals for culling based on production and 5 for use as foundation stock.</td>
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</tbody>
</table>

A. Teacher should do sample problems-student practice. Teacher should show students how to evaluate records and make decisions when culling and selecting foundation breeding stock.

A. Class discussion-teacher summary. B. Use sample records for illustrations.
MODULE OF INSTRUCTION

Title: Using Livestock Records to Improve Production  Code: 01.010402-01

Evaluation:

Table I - Supplementary information

Suggested items of concern when comparing production standards for beef, sheep, swine, dairy cattle, broilers, and laying hens.

a. pounds of gain per day (beef, lambs, swine)
b. weight of pigs (or litters) at 35 days
c. Thickness of back fat (market swine)
d. size of loin eye (beef)
e. number of lambs per ewe
f. pounds of milk per year (dairy)
g. pounds of meat per pound of feed (broilers)
h. number of eggs per year (laying hens) - Feed per dozen eggs
RESOURCE MATERIALS

Books
Diggins & Bundy, Dairy Production, Prentice Hall, Inc., 341 pages. $6.48
Fuergensen & Mortenson, Approved Practices in Dairying. Interstate, Danville, Ill.

Bulletins & Leaflets
New York State College of Agriculture, Cornell University, Ithaca, N.Y.
  Feeder Pig Production & Marketing in N.Y.S. Ext.Bull.#1210
  Raising Beef Cattle in N.Y.S. Ext.Bull.#1011
  Laying Flock Management Ext.Bull.#1061
  Breeding Cows for Longer Herd Life Ext.Bull.#1199
  Estimating the Transmitting Ability of Cows Ext.Bull.#1196
  Herdmate Comparisons and their use in evaluating Dairy Cows Ext.Bull.#1115
  Feeding the Dairy Cow for Maximum Returns Ext.Bull.#1156

Eastern Artificial Insemination Cooperative
  Maintaining High Breeding Efficiency in the Dairy Herd

Dept. of Animal Science, Morrison Hall, Cornell University
Putting Your Dairy Records to Work, Series 11

Audio Visuals
American Angus Association
  Production Records-Your Biggest Advantage
    movie, 1969, color, 30 minutes (not previewed by author)

Eastern Artificial Cooperative
  Maintaining High Breeding Efficiency in the Dairy Herd
    (overhead masters with bulletin)

Other Useful Materials
Breed Associations & Coops
  Breeding Record Forms & Breeding Information

Dairy Herd Improvement Cooperative, Morrison Hall, Cornell University
  John Doe Record Set (set of sample computerized dairy records)
Title - FARM BUSINESS ANALYSIS  
Code - 01.010403-01

DESCRIPTION:

The modern farm operator must constantly evaluate all aspects of his operation and make plans to reorganize those areas that need improvement. He must keep accurate records of production and labor, and an inventory of current supplies. He must use modern business techniques if he is to compete in this industrialized farming era. This module will give the student an opportunity to learn how to analyze factors of rates of production, labor efficiency, and costs to improve his farm operation.

MAJOR DIVISIONS OR UNITS OF CONTENT:

<table>
<thead>
<tr>
<th>Time Allocations</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Importance of Farm Business Analysis</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. Calculating Farm Business Measures</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>3. Analyzing Farm Businesses</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

Revised 4/75
Title - Farm Business Analysis

OBJECTIVES to be obtained:

Students will be able to:

1. Correctly list three purposes for performing a farm business analysis.

2. Differentiate, to the instructor's satisfaction, between a farm business summary and a farm business analysis.

3. Correctly list a minimum of six measurable factors affecting returns to a farm business.

4. Given the necessary records, correctly calculate amounts for at least ten of the factors affecting returns to the farm business, for which you have records.

5. Correctly calculate at least ten selected farm business measures used in financial statement analysis, for the farm from which you have records.

6. List the four basic resources a farmer has to work with to produce goods and analyze, to the instructor's satisfaction, each for a selected farm.

7. Analyze records and physical characteristics of a selected farm business in terms of factors from objectives 4, 5, and 6, then recommend to the instructor's satisfaction changes based on your analysis.
Title: Farm Business Analysis

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Importance of Farm Business Analysis</strong></td>
<td><strong>A. Purposes of Farm Business Analysis</strong></td>
</tr>
<tr>
<td><strong>Objective 1</strong> Correctly list three purposes for</td>
<td>To determine how the business is doing at a given time.</td>
</tr>
<tr>
<td>performing a farm business analysis.</td>
<td>To determine why the business is as it is.</td>
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<tr>
<td></td>
<td>To compare the farm with others or groups of similar farms.</td>
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<tr>
<td></td>
<td>To evaluate each part of the business as well as the whole.</td>
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<td></td>
<td>To provide budgeting changes in the farm business.</td>
</tr>
<tr>
<td><strong>Objective 2</strong> Differentiate, to the instructor's</td>
<td>**B. Farm Business Summary - Record forms allowing you to see how the</td>
</tr>
<tr>
<td>satisfaction, between a farm business summary and a</td>
<td>farm as a whole has profited.</td>
</tr>
<tr>
<td>farm business analysis.</td>
<td>Operating statement</td>
</tr>
<tr>
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<td>Financial statements</td>
</tr>
<tr>
<td></td>
<td>**B. Farm Business Analysis - calculations taking an in depth look at</td>
</tr>
<tr>
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<td>all enterprises on the farm and their individual profitability</td>
</tr>
<tr>
<td></td>
<td>Measures depend upon type of enterprise-examples</td>
</tr>
<tr>
<td></td>
<td>Some enterprises affect others - examples</td>
</tr>
<tr>
<td></td>
<td>**C. Samples of summaries and analysis for individual farms and groups</td>
</tr>
<tr>
<td></td>
<td>of farms,</td>
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<td></td>
<td>Individual records</td>
</tr>
<tr>
<td></td>
<td>Group summary</td>
</tr>
</tbody>
</table>

4
### Farm Business Analysis

<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture-discussion to present new information.</td>
<td>A. Students take notes on information presented.</td>
<td>A. Written test.</td>
</tr>
<tr>
<td>B. Demonstrate sample records and group farm business summaries to show how analysis may help the farm business.</td>
<td>B. Students may make some calculations from a summary which would be used in analysis.</td>
<td>B. Oral Reports on farm business analysis—students identify weak and strong parts of a farm business.</td>
</tr>
<tr>
<td>C. Guest speaker such as county agent involved in farm analysis.</td>
<td>C. Students may complete a farm business summary or a farm business analysis on their home farm or cooperative farm.</td>
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<tr>
<td>D. Guest speaker from a local Bank-Farm Representative.</td>
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</tbody>
</table>

A. Take notes on information presented. B. Student discussion of need for farm business analysis—may ask questions of guest speakers.
Title - Farm Business Analysis

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 2 - Calculating Farm Business Measures</td>
<td><strong>A. Factors affecting returns to a farm business.</strong></td>
</tr>
<tr>
<td>Objective 3</td>
<td><strong>Factors</strong></td>
</tr>
<tr>
<td></td>
<td>Size</td>
</tr>
<tr>
<td></td>
<td>Rates of production</td>
</tr>
<tr>
<td></td>
<td>Labor efficiency</td>
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<tr>
<td></td>
<td>Capital efficiency</td>
</tr>
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<td></td>
<td>Cost control</td>
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<td></td>
<td>Economic climate</td>
</tr>
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<td></td>
<td>Market price</td>
</tr>
<tr>
<td></td>
<td>Farm losses</td>
</tr>
<tr>
<td>Objective 4</td>
<td><strong>B. Measuring factors affecting returns to a farm business.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Examples given above.</strong></td>
</tr>
<tr>
<td></td>
<td><strong>C. Relative importance of various factors to different farm enterprises.</strong></td>
</tr>
<tr>
<td></td>
<td>Calculations for measures of factors affecting returns to a farm business. (Teacher should select factors based on local situation.)</td>
</tr>
</tbody>
</table>

Objective 3
Correctly list a minimum of six measurable factors affecting returns to a farm business.

Objective 4
Given the necessary records, correctly calculate amounts for at least ten of the factors affecting returns to the farm business for which you have records.
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture-discussion to present information.</td>
<td>A. Take notes on information.</td>
<td>A. Evaluate students notes taken during field trips.</td>
</tr>
<tr>
<td>B. Field trip to a cooperating farms, students should list factors affecting returns to the farm and their relative importance.</td>
<td>B. During field trip determine factors affecting returns to the farm and how they might be measured, this should be recorded for reference.</td>
<td>B. Written test on Farm Business Measures.</td>
</tr>
<tr>
<td>C. Group discussion of information obtained on field trip.</td>
<td>C. Participate in group discussion.</td>
<td>C. Participate in group discussion.</td>
</tr>
<tr>
<td>D. Chalk and board teacher work out example problems.</td>
<td>D. Students keep a record of definitions used in calculating Farms Business Measures.</td>
<td>D. Evaluate students participation.</td>
</tr>
</tbody>
</table>

| A. Group consensus to determine calculations to be used (each student should be familiar with at least 15 calculations) | A. Participate in group discussion to determine calculations to use. | A. Evaluate student participation.                              |
| B. Demonstrations of methods to perform calculations.          | B. Take notes during demonstration.                                | B. Written test on selected measures and completing calculations. |
| C. Student practice.                                      | C. Practice making calculations assigned in class.                |                                                                  |
| D. Field trip-if time permits obtain information from a farm for students to calculate. | D. Students complete calculations on the home farm or cooperative farm. |                                                                  |
### Objectives by Unit

#### Objective 5
Correctly calculate at least ten selected farm business measures used in financial statement analysis for the farm which you have records for.

**CONTENT**

A. Farm business measures taken from financial statements
   - Cash flow
   - Debt repayment capacity
   - % equity
   - Debt per productive unit
   - % total debt in long term
   - % farm business assets are of total assets
   - % of assets readily convertible to cash
   - % return to owned capital
   - % return to all capital
   - % return to various enterprises
   - Capital turnover
   - Growth of assets
   - Fixed expenses - variable expenses
   - Other

B. Calculations for selected business measures.
   (see references)

C. Relative importance of measures to individual enterprises
   - Major enterprises vs. minor enterprises
   - Year around enterprises vs. short term enterprises.
   - Direct income enterprises vs. supporting enterprises.

---

### Unit 3 - Analyzing Farm Businesses

#### Objective 6
List the four basic resources a farmer has to work with to produce goods and analyze to the instructor's satisfaction, each for a selected farm.

**CONTENT**

A. Basic farm production resources
   - Land
   - Capital
   - Labor
   - Management

B. Relative importance of each to farm production
   - Crop production
   - Animal production

C. Methods of analyzing production resources
   - Physical description
   - Use of records
   - Problem solving method to test alternatives
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture discussion to present information. Teacher work out examples on board.</td>
<td>A. Take notes on information.</td>
<td>A. Students will list the four basic resources that a farmer must work with to produce products.</td>
</tr>
<tr>
<td>B. Field trip(s) to determine measures used by farmers.</td>
<td>B. Participate in group discussion.</td>
<td>B. Students will give oral reasons for enterprise selections for a given farm.</td>
</tr>
<tr>
<td>C. Student practice in calculating measures.</td>
<td>C. Question resource person.</td>
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<tr>
<td></td>
<td>D. Practice analyzing production resources for a given farm.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Students should select the enterprizes that should be successful in the local areas and list the reasons for their selections.</td>
<td></td>
</tr>
</tbody>
</table>

A. Lecture discussion to present information.
B. Group consensus to determine relative importance of resources.
C. Resource person such as county agent to discuss methods of analyzing production resources.
D. Student practice for a given farm the students have visited.
E. Student practice in calculating measures.
### Title - Farm Business Analysis

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 7<br>Analyze records and physical characteristics of a selected farm business in terms of factors from objectives 4, 5 and 6, then recommend to the instructor's satisfaction changes based on your analysis. | A. Farm records to include,<br>  - Balance sheet (financial statement)<br>  - Operating statement<br>  - Information adequate to fill in a farm business chart.<br>  - Net worth statement.<br>  
B. Factors to consider in evaluating records for a business change.<br>  - Time period the records cover<br>  - Are the records characteristic of past years?<br>  - Affect of one change on entire business<br>  - Are records accurate in terms of what is being done in the business?<br>  - Expected future changes affecting the business, based on current knowledge<br>  - Others |

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
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<tbody>
<tr>
<td>A. Lecture discussion to show students what is contained in the records and to</td>
<td>A. Take notes on information gain understanding of records and how they are used.</td>
<td>A. Evaluate completed assignment.</td>
</tr>
<tr>
<td>clarify the assignment.</td>
<td>B. Perform assigned calculations, analyze records, and recommend changes.</td>
<td>B. Evaluate students notebook for the module.</td>
</tr>
<tr>
<td>B. Field trip to allow students opportunity to evaluate selected farm.</td>
<td>C. Take part in group discussion after assignment is completed.</td>
<td>C. Grade students accumulative folder work.</td>
</tr>
<tr>
<td>C. Student supervised study to meet objective 7.</td>
<td>D. Students could calculate their own net worth statements on their accumulated folders that</td>
<td></td>
</tr>
<tr>
<td></td>
<td>are required for each student studying vocational agriculture.</td>
<td></td>
</tr>
<tr>
<td>D. Group discussion after all have completed the assignment. Student Reports.</td>
<td>E. Lab exercises on Objective 7</td>
<td></td>
</tr>
</tbody>
</table>
RESOURCE MATERIALS

Books:
1. Farm Management Handbook-1972, Cornell University, Economics Department
2. Profitable Farm Management-Hamilton and Bryant - Prentice Hall

Bulletins:
1. Dairy Farm Management Business Summary - current year from Cornell Agriculture Economic Department

Periodicals:
Successful Farming
Farm Journal

Audivisuals:
1. Records of individual farm businesses available from Agriculture Economics Department, Cornell University
2. Sample ELFAC records
3. Farm business charts
4. Cornell farm inventory books and other types
5. Cornell cash account books and other types such as New Hollands
6. A.E. records available from ATANY
MODULE OF INSTRUCTION

Title - PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS

DESCRIPTION:

The student will study the Farm Power, Machinery, and Equipment Needs of a farm business. The size and type of farm, soils and topography, capital and labor resources will be studied.

This module will include the criteria used in purchasing machinery and equipment, selecting the dealer, whether to purchase new or used equipment, and scheduling equipment purchases.

Students will take field trips to farm machinery dealerships and farms to better understand the problems involved in meeting the farmer's power, machinery and equipment requirements.

The economics of owning, renting, leasing, cooperative ownership and custom hire of machinery for a particular farm business will be discussed.

The fixed and operational cost of owning and operating machinery will be studied.

Students will learn how to keep and use farm power and machinery records and to compare the records of costs with farms throughout the State to determine the investments and efficiency of a particular farm business. The total investment in machinery and its relationship to labor income will be studied.

DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>I. Determining Needs</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
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<td>3</td>
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<table>
<thead>
<tr>
<th>II. Alternatives Available</th>
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<tbody>
<tr>
<td>3</td>
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<tr>
<td>6</td>
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</table>

<table>
<thead>
<tr>
<th>III. Purchasing</th>
</tr>
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<tbody>
<tr>
<td>3</td>
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<td>3</td>
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<table>
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<tr>
<th>IV. Records</th>
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<tbody>
<tr>
<td>3</td>
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<td>3</td>
</tr>
</tbody>
</table>

13 18

Revised 4/75
OBJECTIVES to be obtained:

The student will:

1. List six factors that are used to determine the farm power, machinery, and equipment needs of a farm business.

2. Determine the needs for power units, machinery and equipment in terms of number and/or size of units.

3. Inventory farm power, machinery and equipment to determine present and future needs.

4. Determine the alternatives available to a farmer for a given enterprise for power units, machinery and equipment.

5. Demonstrate the ability to select from the alternatives the alternative that will best satisfy a given situation.

6. Write a set of general specifications for a piece of machinery or power unit based on a farm situation and on this basis select the unit best suited for the situation.

7. Select the dealer from whom a power unit or machine will be purchased.

8. Develop and maintain permanent and temporary records for power units, machinery and equipment.
# Planning Farm Power, Machinery and Equipment Needs

**Title:** Planning Farm Power, Machinery and Equipment Needs

## Objectives by Unit

<table>
<thead>
<tr>
<th>Unit I - Objective #1.</th>
<th>Selection factors based on:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Size and type of farm</td>
</tr>
<tr>
<td></td>
<td>Soil types</td>
</tr>
<tr>
<td></td>
<td>Topography</td>
</tr>
<tr>
<td></td>
<td>Field shape, size and location</td>
</tr>
<tr>
<td></td>
<td>Labor force</td>
</tr>
<tr>
<td></td>
<td>Skill of operator</td>
</tr>
<tr>
<td></td>
<td>Capital availability</td>
</tr>
<tr>
<td></td>
<td>Dealer service</td>
</tr>
<tr>
<td></td>
<td>Equipment required for:</td>
</tr>
<tr>
<td></td>
<td>- efficiency</td>
</tr>
<tr>
<td></td>
<td>- mechanization</td>
</tr>
<tr>
<td></td>
<td>- automation</td>
</tr>
<tr>
<td></td>
<td>Relationship of equipment to income:</td>
</tr>
<tr>
<td></td>
<td>- Size of business</td>
</tr>
<tr>
<td></td>
<td>- Date of production</td>
</tr>
<tr>
<td></td>
<td>- Labor efficiency</td>
</tr>
<tr>
<td></td>
<td>- Combination of enterprise</td>
</tr>
</tbody>
</table>

**Code:** 01.010403-02

**AGRICULTURAL**
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>List the agricultural enterprises in the community. Study machinery requirements using farm power machinery data from the Department of Agricultural Economics Publications Cornell and Farm Business Analysis Studies. Take field trips to dairy, fruit, poultry, vegetable farms in the area. Have students list the types of machinery and equipment found on these farms. Talk to the operators regarding their equipment needs, the equipment that they lack, and how they determine their needs. Students divide into small groups and make lists of equipment requirements for the various enterprises. Students should write the reasons for their selections and report to the class explaining their reasons. Explore the relationship of equipment use to income, through use of farm business studies of county and/or state. Comparison of man work units of 10 years ago with present for various enterprises.</td>
<td>A. List the factors that are used to determine the power, machinery and equipment needs of a particular farm business. B. Recognize the correlation of mechanization - labor efficiency and labor income.</td>
<td>Students will list six factors that are used to determine the needs for power, machinery and equipment.</td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Unit I - Objective 2. Determine the needs for power</td>
<td>A. Factors to include:</td>
<td></td>
</tr>
<tr>
<td>units, machinery and equipment in terms of number and/or</td>
<td>- Size of enterprise</td>
<td></td>
</tr>
<tr>
<td>size of units.</td>
<td>- Field conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(size-shape-topography - drainage, etc.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Labor force</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Weather conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Present equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Field capacity or efficiency</td>
<td></td>
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<tr>
<td></td>
<td>- Factor influences</td>
<td></td>
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<td></td>
<td>- machine width</td>
<td></td>
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<tr>
<td></td>
<td>- speed of travel</td>
<td></td>
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<td></td>
<td>- down time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- draft requirements</td>
<td></td>
</tr>
</tbody>
</table>
**TEACHING METHODS**  | **STUDENT APPLICATION ACTIVITIES**  | **EVALUATION PROCEDURES**
---|---|---
Lecture-Discussion of comparison of different size of machines and the work that can be done in a given time element. Listing of factors that would be considered in size of machine selected, in terms of enterprise and/or field capacity. Field trip or work experience on school demonstration plot comparison of tractor work as plowing - 2 plow vs. 3 plow - single row vs. two row chopper. Comparison of need for power units for operation of various size equipment Compaction comparison of different weight machines of tractors on fitted land. Supervised study using references Problem solving of machine field capacity. | Problem solving of selected problems to determine efficiency of various machines under typical situations. Observations of field work measurements, timing. | Students will make selection of size of equipment and number of units necessary for operation at an efficient level for a single crop enterprise. |
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Unit # I - Objective 3.  
Take an inventory of farm power machinery and equipment to determine present and future needs | Inventory of present farm equipment  
- Number of units  
- Size of units  
- Date of manufacture or model  
- Condition of units  
- Degree of obsolescence |
| Unit II - Alternative Available Objective # 4.  
Determine the alternatives available to a farmer for a given enterprise for power units machinery and equipment. | A. Alternatives  
- Do without replacement  
- Replacement use inefficiently  
- Replacement doing customs work  
- Cooperative ownership  
- Hire the work done  
- Rent equipment  
- Lease equipment  
- Replace with second hand equipment |
### Planning Farm Power, Machinery, and Equipment Needs

<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field trip to farm for purpose of taking an inventory of power units, machinery and equipment.</td>
<td>Take a farm equipment inventory, and determine the condition of the machinery, good - fair - poor. Determine which machines and power units need replacement with justification as to reason based on objective #2.</td>
<td>Students will make an inventory of equipment, power units, and machinery on a farm to instructor's satisfaction.</td>
</tr>
<tr>
<td>Brief discussion of the alternatives that are available for a farm to use for the various enterprises in a given situation.</td>
<td>Students list the various alternatives available for enterprises in given situations.</td>
<td>Students list possible alternatives available for a given situation.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit II - Objective #5</td>
<td>A. Alternatives</td>
</tr>
<tr>
<td>Demonstrate the ability to select from the alternatives the alternatives that will best satisfy a given situation.</td>
<td>. Owning</td>
</tr>
<tr>
<td></td>
<td>. cost</td>
</tr>
<tr>
<td></td>
<td>. convenience</td>
</tr>
<tr>
<td></td>
<td>. Leasing</td>
</tr>
<tr>
<td></td>
<td>. availability</td>
</tr>
<tr>
<td></td>
<td>. cost</td>
</tr>
<tr>
<td></td>
<td>. Seasonality</td>
</tr>
<tr>
<td></td>
<td>. Custom hire</td>
</tr>
<tr>
<td></td>
<td>. cost</td>
</tr>
<tr>
<td></td>
<td>. labor</td>
</tr>
<tr>
<td></td>
<td>. timing</td>
</tr>
<tr>
<td></td>
<td>. Group ownership</td>
</tr>
<tr>
<td></td>
<td>. cost</td>
</tr>
<tr>
<td></td>
<td>. repairs</td>
</tr>
<tr>
<td></td>
<td>. use schedule</td>
</tr>
<tr>
<td></td>
<td>. group responsibilities</td>
</tr>
<tr>
<td></td>
<td>. Liability</td>
</tr>
<tr>
<td></td>
<td>. custom hire</td>
</tr>
<tr>
<td></td>
<td>. leasing</td>
</tr>
<tr>
<td></td>
<td>. group ownership</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit II - Invite owners or dealerships to discuss owning and leasing equipment</td>
<td>Role playing as outlined under method.</td>
<td>Student evaluation as to the better alternatives to situation to instructor's satisfaction.</td>
</tr>
<tr>
<td>to class members.</td>
<td>Become familiar with custom machinery rates by preparing list of jobs and rates applied.</td>
<td></td>
</tr>
<tr>
<td>Invite custom operators to speak to the students or use the tape interview</td>
<td>For a given situation compare the costs of ownership to the other major alternatives.</td>
<td></td>
</tr>
<tr>
<td>dealing with prices, equipment involved, timing problems and work schedule.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Extension Service Charts and Commercial Charts on rates for custom work.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost account enterprise evaluation analysis for field crops.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Invite dealerships to the lab and discuss leasing equipment and current rates,</td>
<td></td>
<td></td>
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<tr>
<td>responsibilities of all parties, breakage and damage problems, liability.</td>
<td></td>
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</tr>
<tr>
<td>Have farmers that own machinery jointly present their agreements. Discuss the</td>
<td></td>
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</tr>
<tr>
<td>problems of their agreements. Discuss the problems of group ownership. This can</td>
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<tr>
<td>best be done by interview using a tape recorder.</td>
<td></td>
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</tr>
<tr>
<td>Divide the class into four groups, role play, owning - leasing - custom hire</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and group ownership of machinery and equipment. Have students define the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>advantages and disadvantages of each.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem solving using given situation for group discussion.</td>
<td></td>
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</tr>
</tbody>
</table>
## Objectives by Unit

**Unit II - Objective #5 (continued)**

Demonstrate the ability to select from the alternatives the alternative that will best satisfy a given situation.

<table>
<thead>
<tr>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Cost involved in owning and operating machinery and equipment.</td>
</tr>
<tr>
<td>- Fixed costs</td>
</tr>
<tr>
<td>- depreciation</td>
</tr>
<tr>
<td>- taxes</td>
</tr>
<tr>
<td>- insurance</td>
</tr>
<tr>
<td>- interest on investment</td>
</tr>
<tr>
<td>- storage</td>
</tr>
<tr>
<td>- Operating costs</td>
</tr>
<tr>
<td>- maintenance</td>
</tr>
<tr>
<td>- gas and oil</td>
</tr>
<tr>
<td>- lubrication</td>
</tr>
<tr>
<td>- repair bills</td>
</tr>
</tbody>
</table>
## TEACHING METHODS

- Analysis of cost account records: Compare local farm enterprises with state studies for the same period in the local area.
- Have students keep records of fixed and operating costs of their farms.
- Supervised study or discussion based on Chapter 3, pgs. 10-13 Farm Power and Machinery Management, or Chapt. 35 - Tractor and Machinery Management pgs. 533-548, Machines for Power Farming.

## STUDENT APPLICATION ACTIVITIES

- Determine the total cost of operation of a specific farm machinery or power unit and compare the costs to rental, lease, custom group ownership, or a single crop.
- Have students make a list of all fixed and operating costs of owning and operating equipment. Compare these costs with leasing and custom rates. Compare the home farm with state-wide data for a given situation.
- Make an analysis of the machinery and equipment records. Compare the costs of the home farm with others of the same size. Determine the weak and strong points and make adjustments.

## EVALUATION PROCEDURES

- Student evaluation as to the better alternatives in situation to instructor satisfaction.
- Compare total machine and labor cost of home situation to that of other farms of relative size for state or county.
### OBJECTIVES BY UNIT

#### Unit III - Purchasing

**Objective #6.**

Students will write a set of general specifications for a piece of machinery or power unit based on a farm situation and on this basis select the unit best suited for the situation.

### CONTENT

<table>
<thead>
<tr>
<th>A. Determine the situation</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Based on situation determine size and basic needs</td>
</tr>
<tr>
<td>C. Examine the market availability for the machine</td>
</tr>
<tr>
<td>D. Comparison of machines</td>
</tr>
<tr>
<td>- Size</td>
</tr>
<tr>
<td>- Capacity</td>
</tr>
<tr>
<td>- Safety</td>
</tr>
<tr>
<td>- Price</td>
</tr>
<tr>
<td>- Service and repair problems</td>
</tr>
<tr>
<td>- Other features</td>
</tr>
<tr>
<td>Write set of general specifications based on the situation</td>
</tr>
</tbody>
</table>

#### Unit III - Objective #7.

Select the dealer from whom a power unit or machine will be purchased.

**Sales organization to consider.**

<table>
<thead>
<tr>
<th>A. Dealer</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Reliability</td>
</tr>
<tr>
<td>- Reputation for:</td>
</tr>
<tr>
<td>- honesty</td>
</tr>
<tr>
<td>- service</td>
</tr>
<tr>
<td>- Parts inventory</td>
</tr>
<tr>
<td>- stock on hand</td>
</tr>
<tr>
<td>- maintenance of inventory</td>
</tr>
<tr>
<td>- Repair facilities</td>
</tr>
<tr>
<td>- mechanicability</td>
</tr>
<tr>
<td>- shop facilities</td>
</tr>
<tr>
<td>- costs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. Completion of sale</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Time to make purchase</td>
</tr>
<tr>
<td>- Price</td>
</tr>
<tr>
<td>- trade in allowance</td>
</tr>
<tr>
<td>- Terms for credit</td>
</tr>
<tr>
<td>- sources of credit</td>
</tr>
<tr>
<td>- Sales purchase forms</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop with the class a problem situation based on a farm that has been visited earlier on the school facility and determine the size and needs of the machine or power unit. Field trip to several dealers to look at machine(s) and talk with dealer about features of this product. Examine sales literature and other dealer information relative to the product under consideration. Class discussion of features found on machines as listed in the content. Consider reaction of farmers in the neighborhood who already are using these machines and have experiences. Look for strong and weak points. Individual instruction which students write their specifications. Oral reports on machine or power unit selected.</td>
<td>Development of the situation. Talk with dealers about features that are on the machine. Collect sales literature dealing with the machine or power unit and evaluate strong and weak points of each product. Prepare a set of general specification for the machine or power unit. On the basis of the specifications select the machine or power unit that would be purchased giving valid reasons. Present as an oral report.</td>
<td>Student development of the situation in participation. Written specifications for the machine or power unit to instructor's satisfaction. Oral report on the machine selected with valid reasons to instructor's satisfaction.</td>
</tr>
<tr>
<td>Lecture-discussion of the importance of selection of dealer and the service provided. Field trip to dealership to observe the parts inventory and how stock is maintained. Discuss with dealer the sales aspect in terms of: (a) price (b) trade (c) finance (d) record keeping and legal papers (e) new vs. used equipment. Have students prepare samples of sales and credit forms as well as figure the final price for the machine as discount, trade vs. the list price (Emphasis should not be placed on how credit is arranged as students will have had this material in the module on farm credit).</td>
<td>Group evaluation of dealership in terms of strong and weak points based on the content materials of: Reliability Reputation Parts inventory Repair facilities Preparation of sales records and forms. Determine the sales price of an item figuring best price with and without trade. Determine sales price in terms of total price paid after credit cost is applied.</td>
<td>Students select a dealer whom they feel they could do business with. Written test determine best price for a machine using several methods of sale and credit arrangements.</td>
</tr>
</tbody>
</table>
## OBJECTIVES BY UNIT

### Unit IV - Records

**Objective #8.**

Develop and maintain permanent and temporary records for power units, machinery and equipment.

### CONTENT

**Records needed for Machinery Records**

- **Inventory**
  - number of units
  - size of units
  - date of purchase
  - price
  - condition

- **Depreciation schedule**
  - tax purposes
    - straight line
    - sum of digits
    - declining balance
    - salvage value
  - practical purposes
    - annual use
    - obsolescence
    - costs of repair

- **Fixed costs**
  - depreciation
  - taxes
  - insurance
  - interest on investment
  - storage

- **Operational cost (variable costs)**
  - maintenance
  - fuel
  - lubrication
  - repair

- **Temporary and Permanent records**
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture - discussion in review of the inventory importance from objectives.</td>
<td>Problem solving of various methods of determining depreciation.</td>
<td>Develop and maintain permanent and temporary records for power units, machinery and equipment.</td>
</tr>
<tr>
<td>B. Lecture method of the method of depreciation basis as compared to the practical purposes.</td>
<td>Problem solving of various methods of determining fixed and operational costs.</td>
<td></td>
</tr>
<tr>
<td>C. Have students work several problems using various methods of determining depreciation rates.</td>
<td>Develop set of permanent and temporary records for power units, machinery and equipment showing -</td>
<td></td>
</tr>
<tr>
<td>D. Discuss the comparison of fixed vs. operational costs of a machine or power units.</td>
<td>- Inventory</td>
<td></td>
</tr>
<tr>
<td>E. Have students determine various total costs for a machine or power unit.</td>
<td>- Depreciation</td>
<td></td>
</tr>
<tr>
<td>F. Study existing record forms available for machinery, equipment and power units as cash account records, farm inventory and operational records.</td>
<td>- Cost of operation.</td>
<td></td>
</tr>
<tr>
<td>G. Students develop set of power unit, machinery and equipment records necessary for a farm business. a. inventory b. fixed costs c. operational costs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MODULE OF INSTRUCTION

Title - PLANNING FARM POWER, MACHINERY AND EQUIPMENT NEEDS

Code - 01.010403-02

RESOURCE MATERIALS

A. Books -
- Doane's Farm Management Guide.
- Profitable Farm Management. Hamilton & Bryant.
- Farm Machinery Service Manuals.
- Machines for Power Farming - Stone & Sullivan, 2nd ed. Wiley
- Farm Power and Machinery Management - Hunt - Iowa State Univ. Press - Ames Iowa
- Farm Management Handbook - Department of Agricultural Economics IMS.

B. Bulletins -
- Farm Inventory Book. Cornell University
- Handling Hay Crops - 362. Cornell University
- Tillage and Soil Manipulation - 353. Cornell University
- Auger Conveyors - 325. Cornell University
- Hay Conditioners - 339. Cornell University
- Agricultural Engineering Extension Bulletin No. 363-364-365, Department of Agricultural Engineering - College of Agriculture - L.M.S.

C. Periodicals -
- Farm Technology.
- Successful Farming. Machinery Management Issue, February issues.
- Selected Principles Based on the Relationship of Certain Economic Factors to Labor Income. Cornell University.
- Farm Management Handbook. Cornell University, current year.
- Summaries of N.Y.S. dairy farm business, current year.
- Farm Business Chart. Agricultural Economics, Cornell University.
- Hoards Dairyman - Earl Atkinson, Wisconsin

D. Audiovisuals -
- Farm Machinery & Equipment Companies
- International Harvester
- Case - Ford
- John Deere
- New Idea
MODULE OF INSTRUCTION

Title - FARM LABOR MANAGEMENT

DESCRIPTION:

Management of farm labor has become an integral part of the farm business. Hiring and keeping interested and dedicated individuals is essential to everyone involved in the agricultural industry.

Students involved in this module will be primarily involved with determining labor needs, methods of advertising, evaluating prospective employees, incentive plans, state and federal requirements, required records, and employer-employee relationships. Emphasis will be placed on agricultural conditions in the local and statewide areas.

MAJOR DIVISIONS OR UNITS OF CONTENT

1. Determining Labor Needs in the Farm Business
2. Techniques of Securing Farm Labor
3. State and Federal Regulations
4. Labor Records
5. Employer-Employee Relations

Time Allocations

<table>
<thead>
<tr>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
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<tr>
<td>2</td>
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<td>1</td>
<td>2</td>
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<tr>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>5/20</td>
</tr>
</tbody>
</table>

Revised June 1974
MODULE OF INSTRUCTION

Title - FARM LABOR MANAGEMENT

Objectives to be obtained:

The student will be able to:

1. Identify the major source of existing farm labor in his surrounding area.
2. Determine the labor efficiency of a farm.
3. Complete a farm business chart for a given operation for man work units and man equivalent.
4. Identify the labor needs in a given situation using information on a farm business chart for making an analysis of the labor requirements.
5. Write a job description for three types of farming jobs.
6. List four methods of securing farm labor, use one method (other than the newspaper) to illustrate how effective it is in securing farm labor.
7. Write a newspaper ad for farm labor.
8. Describe four qualities to seek in an employee.
9. Evaluate to the instructors satisfaction job applications through the study of resumes, interviews and references.
10. List ten state and federal regulations which presently apply to farm labor.
11. List seven items that are included in farm labor records.
12. Demonstrate to the instructors satisfaction your ability to complete farm labor records to comply with state and federal regulations.
13. List ten ways that a farmer can stimulate his labor force so that the force can be efficient, productive and loyal.
14. Make an incentive proposal for farm labor.
### Objectives by Unit

| Unit 1 - Determining Labor Needs in the Farm Business.  
Objective 1  
Identify the major source of existing farm labor in his surrounding area. | **Content** |
| --- | --- |
|  | A. Types of farms in area  
. Dairy  
. Beef  
. Poultry  
. Truck  
. Grain  |
|  | B. Examples of levels of employment sought  
. Management  
. Recordkeeper  
. Mechanic  
. Herdsman  
. General laborer  |
|  | C. Amount of family labor available  
D. Adult labor available  
E. Current graduates from high school and post high schools  
F. Migrant labor  |

| Objective 2  
Determine the labor efficiency of a farm. | **Content** |
| --- | --- |
|  | A. Farm acreage (total)  
B. Crop acres  
C. Number of livestock  
D. Amount of machinery  
E. Crop production  
F. Product production  
G. Automation  
H. Comparison of all of these above with a cross section of state farmers.  |

| Objective 3  
Complete a farm business chart for a given operation on man work units and man equivalent. | **Content** |
| --- | --- |
|  | A. Man work units  
B. Man equivalent  |

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Field trip to survey area operations.</td>
<td>A. Discussion of types of operations discovered (develop a list of types in the area for notebook).</td>
<td>A. List 4 sources of farm labor.</td>
</tr>
<tr>
<td>B. Guest speaker</td>
<td>B. Discussion of problems and questions with each speaker. Write one question to ask each speaker.</td>
<td>B. Students make a farm labor survey for the school district.</td>
</tr>
<tr>
<td>C. Make a school district labor survey.</td>
<td>C. Students could keep a farm labor employment list for the school district.</td>
<td></td>
</tr>
<tr>
<td>A. Lecture and class notes.</td>
<td>A. Make a labor efficiency analysis of your home farm or cooperative farm.</td>
<td>A. Teacher evaluation of a sample farm that students will use for labor efficiency analysis.</td>
</tr>
<tr>
<td>B. Class - review records.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Expose students to farm business chart.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Comparative analysis of local farms with state farms.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Review Farm Business Chart.</td>
<td>A. Discussion of chart.</td>
<td>A. Written test on farm business analysis, total man work units and man equivalent.</td>
</tr>
<tr>
<td>B. Use examples of farms for practical experience.</td>
<td>B. Plot ranges of example farms on the charts - compare these with other farms listed.</td>
<td></td>
</tr>
<tr>
<td>C. Use Cornell Farm Business Charts - current charts.</td>
<td>C. Student home farm comparisons.</td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td><strong>Objective 4</strong></td>
<td>A. Analysis of the following</td>
<td></td>
</tr>
<tr>
<td>Identify the labor needs in a given situation using information on a farm business chart for making an analysis of the labor requirements.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Size of business</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Acres of crops</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Number of livestock</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Labor available</td>
<td></td>
</tr>
<tr>
<td><strong>Unit 2 - Techniques of Securing Farm Labor.</strong></td>
<td>A. Farm manager</td>
<td></td>
</tr>
<tr>
<td><strong>Objective 5</strong></td>
<td>B. Herdsman</td>
<td></td>
</tr>
<tr>
<td>Write a job description for three types of farming jobs.</td>
<td>C. Farm hand or laborer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Farm mechanics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Part time help</td>
<td></td>
</tr>
<tr>
<td><strong>Objective 6</strong></td>
<td>A. Role of state and area employment agencies.</td>
<td></td>
</tr>
<tr>
<td>List four methods of securing farm labor. Use one method (other than the newspaper) to illustrate how effective it is in securing farm labor.</td>
<td>B. Notices posted in farm machinery dealerships and food stores.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Field men in agri-business.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Other farmer word of mouth.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>E. Two and four year colleges.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F. Extension service.</td>
<td></td>
</tr>
</tbody>
</table>
### TEACHING METHODS

| A. Use example of a farm business for class discussion. |
| B. Review some adult farmer records in the school district. |

### STUDENT APPLICATION ACTIVITIES

| A. Using the home farm or cooperative farm, make a labor analysis of labor needs on the farm. |
| A. Students will be assigned various types of farm jobs. They will research the job for a youth power project "careers in agriculture." Students will exchange data. |
| A. Discussion in class. Question farmers about their methods of seeking employment. |

### EVALUATION PROCEDURES

| A. Given a sample farm business record students will make an analysis of the labor needs of the farm and list their recommendations. |
| A. Teacher evaluation of careers in agriculture youth power project. Written and/or oral reports. |
| A. Teacher evaluation of students. Reports regarding farmer interviews. |

- **Lecture and class notes.**
- **Supervised study.**
- **Discussion of job descriptions.** Teacher will illustrate how to make a job description using the following:
  - Duties
  - Responsibilities
  - Hours
  - Working conditions
  - Wages

- **Class discussion.**
- **Assign students to interview farmers.**
- **Visit employment agency.**

**713**

7
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 7        | A. Job description  
                   | B. Place of employment  
                   | C. Who to contact  
                   | D. Arranging for interview |
| Objective 8        | A. Desirable qualities  
                   | B. Enthusiasm  
                   | C. Honesty  
                   | D. Punctuality  
                   | E. Interest and attitude  
                   | F. Ability  
                   | G. Performance |
| Objective 9        | A. Resume  
                   | B. References  
                   | C. Interview  

<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
</table>
| A. Lecture using newspaper articles as examples.  
B. Supervised activity.  
C. Hoards Dairy Classified ads. | A. Note taking  
B. Creation of article to be scrutinized by instructor and peers during discussion. | A. Teacher evaluation of article. |
| A. Teacher can cite good farm workers in the area and identify their desirable traits.  
B. Identify undesirable characteristics that cause employee problems. | A. Note taking - prepare self-analysis regarding students  
. Honesty  
. Punctuality  
. Interests and attitudes  
. Ability  
. Enthusiasm  
. Performance | A. Students will list five desirable qualities of an employee. List five undesirable qualities of an employee. |
| A. Lecture and class notes.  
B. Discussion of forms as to content (attached).  
C. Role Playing  
D. Discuss limitations of evaluation criteria. | A. Fill out forms (applications)  
B. Conduct interview as employer and applicant as role playing. Use individuals.  
C. Evaluate each applicant. | A. Teacher evaluation based on job applications made by students.  
B. Students will write resumes of their qualifications. |
## OBJECTIVES BY UNIT

### Unit 3 - State and Federal Regulations

**Objective 10**

List 10 state and federal regulations which presently apply to farm labor.

| CONTENT | A. Required state and federal regulations
| --- | --- |
|  | *Wages*
|  | *Social Security*
|  | *Workman's compensation*
|  | *Minimum wages*
|  | *Migratory labor*
|  | *Occupational health and safety act*
|  | *Child labor laws*
|  | *Occupational Safety Health Act (OSHA)*

<table>
<thead>
<tr>
<th>B. Optional</th>
</tr>
</thead>
</table>
| *Federal and state withholding for taxes*
| *State unemployment insurance*

<table>
<thead>
<tr>
<th>C. Federal forms</th>
</tr>
</thead>
</table>
| *Social Security*
| *Income tax*
| *Other*

<table>
<thead>
<tr>
<th>D. State Forms</th>
</tr>
</thead>
</table>
| *Income tax*
| *Workman's compensation*
| *Time card*
| *Statement of earnings*
| *Wage records*
| *Payroll*

<table>
<thead>
<tr>
<th>E. Farm records</th>
</tr>
</thead>
</table>
| *Electronic*
| *Manual*

### Unit 4 - Labor Records

**Objective 11**

List 7 items to be included in farm labor records.

| CONTENT | A. Types of farm labor records
| --- | --- |
|  | *Social Security*
|  | *Income tax*
|  | *federal*
|  | *state*
|  | *Workman's compensation*
|  | *Time card*
|  | *Statement of earnings*
|  | *Wage records*
|  | *Payroll*
|  | *Incentives*
|  | *Home*
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and discussion.</td>
<td>A. Prepare a list of state and federal labor regulations that can affect student's employment on the home farm and when working on other farms or agri-business related areas of employment.</td>
<td>A. Written test on Objective 10.</td>
</tr>
<tr>
<td>B. Supervised study - Farm labor regulation and information (most current year).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Question and answer session.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Resource person from New York State Labor Department or Extension Agent.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Use classroom resources to compile information needed by students employed in agricultural work.</td>
<td>A. Students will list five of the seven items included in farm labor records.</td>
</tr>
<tr>
<td></td>
<td>B. Discuss the use and need for labor records.</td>
<td>B. Students will fill out all required farm labor records. Teacher will supply data and record forms.</td>
</tr>
<tr>
<td></td>
<td>C. Compile copies of labor record forms.</td>
<td></td>
</tr>
<tr>
<td>A. Review records required.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Class discussion of state and federal regulations.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Supervised study period.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Class discussion on all labor records required by law.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Complete record samples.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Objectives by Unit

<table>
<thead>
<tr>
<th>Objective</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 12</strong>&lt;br&gt;Demonstrate to the instructor's satisfaction your ability to complete farm labor records to comply with state and federal regulations.</td>
<td>A. Farm employee wage record&lt;br&gt;B. Statement of farm worker earnings&lt;br&gt;C. Farm employee time record&lt;br&gt;D. Cornell Farm Account Record&lt;br&gt;E. Cornell Computer Type Record</td>
</tr>
<tr>
<td><strong>Unit 5 - Employer-Employee Relations.</strong>&lt;br&gt;Objective 13&lt;br&gt;List 10 ways that a farmer can stimulate his labor force so that the force can be efficient, productive and loyal.</td>
<td>A. Items creating employee interest&lt;br&gt;  - Training - preparation to do job as employer wishes&lt;br&gt;  - Consistency&lt;br&gt;  - Title - Farm Manager, Farm Mechanic, Herdsman&lt;br&gt;  - Delegation of Authority&lt;br&gt;  - Wages - competitive, tangible&lt;br&gt;  - Working hours&lt;br&gt;  - House&lt;br&gt;  - Farm products - beef, milk&lt;br&gt;  - Incentives and involvements&lt;br&gt;  - Vacation periods</td>
</tr>
<tr>
<td><strong>Objective 14</strong>&lt;br&gt;Make an incentive proposal for farm labor.</td>
<td>A. Purpose of plan&lt;br&gt;B. Define the purpose&lt;br&gt;C. Types of incentive&lt;br&gt;  - Production&lt;br&gt;  - Increase equity&lt;br&gt;  - Profit sharing&lt;br&gt;D. Rewards</td>
</tr>
</tbody>
</table>

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### TEACHING METHODS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Lecture and class notes.</td>
</tr>
<tr>
<td>B.</td>
<td>Supervised practice.</td>
</tr>
<tr>
<td></td>
<td>Filling out each record from example given.</td>
</tr>
<tr>
<td>C.</td>
<td>Discuss merits of each.</td>
</tr>
</tbody>
</table>

### STUDENT APPLICATION ACTIVITIES

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Complete each employee record form.</td>
</tr>
<tr>
<td>B.</td>
<td>Choose the types of records that you need to comply with state and federal regulations.</td>
</tr>
</tbody>
</table>

### EVALUATION PROCEDURES

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Teacher evaluation of completed record examples.</td>
</tr>
</tbody>
</table>

---

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Lecture and student notes.</td>
</tr>
<tr>
<td>B.</td>
<td>Supervised study of reference articles in available magazines.</td>
</tr>
<tr>
<td>C.</td>
<td>Lead students in thinking reflectively regarding employer-employee relations.</td>
</tr>
<tr>
<td>D.</td>
<td>Discuss labor incentives.</td>
</tr>
<tr>
<td>E.</td>
<td>Discuss fringe benefits.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Compile a list of items which can be used to create employee interest and longevity. Select the ones that can be of most benefit to the student.</td>
</tr>
<tr>
<td></td>
<td>A. Teacher evaluation of the list.</td>
</tr>
</tbody>
</table>

---

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Discussion of labor problems.</td>
</tr>
<tr>
<td>B.</td>
<td>Supervised study related to incentive plans.</td>
</tr>
<tr>
<td>C.</td>
<td>Guest speaker of a successful operation and his employee.</td>
</tr>
<tr>
<td>D.</td>
<td>Cite specific arrangements being used currently on local farms.</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A.</td>
<td>Preparation of sample incentive plans.</td>
</tr>
<tr>
<td>B.</td>
<td>Student evaluation of incentive plans.</td>
</tr>
<tr>
<td></td>
<td>A. Teacher evaluation of incentive program developed by the student for a given farm situation.</td>
</tr>
</tbody>
</table>

---

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13
MODULE OF INSTRUCTION

Title - FARM LABOR MANAGEMENT

Resource Materials

Books: Farm Management, Robertson (Lippincott 1958)
Profitable Farm Management, Hamilton & Bryant (Prentice Hall 1956)

Bulletins: Incentive Plans for Hired Men, Ag. Ext. 49
Farm Mgt. Handbook - Ag. Ext. Cornell
New York Econ. Handbook - Most current year
Farm Labor - Regulations and Information - Most current year
Social Security Booklet - U.S. Govt. Printing Office

Periodicals: Local Daily and Weekly Newspapers
Hoards Dairyman
Farm Journal
Pennsylvania Farmer
Successful Farming
Doane's Agric. Report

Audiovisuals: Blank tapes for interviews

Youthpower contest is sponsored by the New York State Farm Bureau.
All counties may enter the contest. See your county Farm Bureau President for details.
**Farm Employee Wage Record**

### Employee
- **Name:**
- **Address:**
- **Social Security No.:**
- **Electronic Account No. 32**

### Employer
- **Name:**
- **Farm No.:**
- **Electronic Accounting Farm Number**

Show below the value of allowances provided regularly each payroll period, if claimed as part of the minimum wage.

<table>
<thead>
<tr>
<th>Housing:</th>
<th>Utilities:</th>
<th>Food:</th>
<th>Other Benefits:</th>
</tr>
</thead>
<tbody>
<tr>
<td>House $</td>
<td>Electric $</td>
<td>Meals (No. $</td>
<td>(List)</td>
</tr>
<tr>
<td>Apartment $</td>
<td>Fuel $</td>
<td>Milk (Qts. $</td>
<td></td>
</tr>
<tr>
<td>Room $</td>
<td>Gasoline $</td>
<td>Eggs (Doz. $</td>
<td></td>
</tr>
<tr>
<td>Other: $</td>
<td>Other $</td>
<td>Meat (Lbs. $</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Total Hours Worked</th>
<th>Units Produced*</th>
<th>Gross Cash Wages</th>
<th>Deductions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cash Social Security Other (Write in)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cash Paid</td>
</tr>
</tbody>
</table>

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*Use for piece work only*
### Statement of Farm Worker Earnings

**No.**

**Employee:**

**Work Period:**

**thru**

**197**

**Total hours worked for period:**

**Number of units, if piece work:**

<table>
<thead>
<tr>
<th><strong>Wages paid:</strong></th>
<th><strong>Allowances:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cash wages</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td>House or lodging</td>
</tr>
<tr>
<td><strong>Deductions:</strong></td>
<td></td>
</tr>
<tr>
<td>Social Security</td>
<td>$__________</td>
</tr>
<tr>
<td>Other</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electricity</td>
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<tr>
<td></td>
<td>Fuel</td>
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<td></td>
<td>Meals</td>
</tr>
<tr>
<td></td>
<td>Milk</td>
</tr>
<tr>
<td></td>
<td>Eggs</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
</tbody>
</table>

**Total deductions**

|$__________ |

**GROSS CASH WAGES PAID**

|$__________ + TOTAL ALLOWANCES $__________ = $__________

(Wage rate $__________ per $__________

**Employer:**

---

---

### Statement of Farm Worker Earnings

**No.**

**Employee:**

**Work Period:**

**thru**

**197**

**Total hours worked for period:**

**Number of units, if piece work:**

<table>
<thead>
<tr>
<th><strong>Wages paid:</strong></th>
<th><strong>Allowances:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Net cash wages</td>
<td>$__________</td>
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<td></td>
<td>House or lodging</td>
</tr>
<tr>
<td><strong>Deductions:</strong></td>
<td></td>
</tr>
<tr>
<td>Social Security</td>
<td>$__________</td>
</tr>
<tr>
<td>Other</td>
<td>$__________</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Electricity</td>
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<tr>
<td></td>
<td>Fuel</td>
</tr>
<tr>
<td></td>
<td>Meals</td>
</tr>
<tr>
<td></td>
<td>Milk</td>
</tr>
<tr>
<td></td>
<td>Eggs</td>
</tr>
<tr>
<td></td>
<td>Other</td>
</tr>
</tbody>
</table>

**Total deductions**

|$__________ |

**GROSS CASH WAGES PAID**

|$__________ + TOTAL ALLOWANCES $__________ = $__________

(Wage rate $__________ per $__________

**Employer:**

---

---
## Farm Employee Time Record

<table>
<thead>
<tr>
<th>Day of Week</th>
<th>Forenoon</th>
<th>Afternoon</th>
<th>Total Hours for the Day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Start: End</td>
<td>Start: End</td>
<td>Start: End</td>
</tr>
<tr>
<td>Example</td>
<td>5:30 : 7:30</td>
<td>8:30 : 12:00</td>
<td>1:00 : 2:30</td>
</tr>
<tr>
<td>Monday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wednesday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sunday</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total hours worked during week: 

Signature of Employee: ___________________________
## TERMS OF EMPLOYMENT
**FOR YOUR HIRED HELP**
*(Check Sheet)*

<table>
<thead>
<tr>
<th>Provision</th>
<th>Yes</th>
<th>No</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output of products per man above average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wages above average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Security</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perquisites</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Running water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central heating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electricity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telephone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Milk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meat</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eggs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fruit &amp; vegetables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incentive payments</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regular working hours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vacation with pay</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workmen's compensation insurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health insurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployment insurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written agreement, annual review</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPLICATION FOR FARM EMPLOYMENT

Date ________________________________

Name ________________________________ Social security No. ________________________

Address ________________________________ Phone ________________________________

FARM EXPERIENCE: No. of years _____ On what size and type of farms have you worked? (acres, kind of livestock, work done)

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

_________________________________________________________________________

What type of work do you prefer? ________________________________

_________________________________________________________________________

LIST EMPLOYMENT OVER PAST THREE YEARS, STARTING WITH PRESENT JOB:

<table>
<thead>
<tr>
<th>Date hired</th>
<th>Date left</th>
<th>Name of employer and address</th>
<th>Position and work done</th>
<th>Reason for leaving</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Have you served in armed forces of U.S.A.? _______ from (date) _______ to (date) _______

Highest rank ________________________________ Type of discharge ____________________

Are you registered for draft? __________ Address of local board _______________________

LIST THREE REFERENCES (not related to you)

<table>
<thead>
<tr>
<th>Name</th>
<th>Address</th>
<th>Telephone No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

725
PERSONAL AND FAMILY INFORMATION:

Age ______ Are you: ( ) single ( ) married ( ) widower ( ) divorced ( ) separated

Height ______________ Weight ______________ White or colored?

Were you raised on a farm? ______________ Where? ______________ Father's name ______________

Was wife raised on a farm? ______________ Where? ______________ Father's name ______________

Does your wife work outside of the home? ______________ Type of work ______________

Names and ages of children ______________

Do other dependents live with you? ______________

Do you own your own household equipment and furniture? ______________

How many years of school did you complete? ______________ Where?

Have you ever farmed for yourself? ______________

Have you had any special training? ______________

Have you or your family any health problems? (Explain) ______________

Have you any physical defects? (Explain) ______________

Do you carry any hospitalization insurance? (Explain) ______________

What are your smoking habits? (Explain) ______________

What are your drinking habits? (Explain) ______________

Have you been arrested? (Explain, omit minor traffic offenses) ______________

What is your church affiliation? ______________ Member?

What is the approximate amount of your debts? $________

How many dollars per week are you supposed to pay on debts? $________

This space can be used for additional questions or comments: ______________

When would you be able to start work? ______________

Should the position be filled, do you wish to be advised if an opening exists later? ______________
PERSONAL INTERVIEW CHECK LIST

(Reminder questions to be used after the applicant has filled out application form.)

Interview with __________________________ Date ____________

REASON FOR CHANGING JOBS:

- low pay
- poor equipment
- poor house
- employer hard to work for
- long hours
- no vacation
- wife's influence
- other _____________

If discharged, why? ____________________________________________________________________________

FARM EXPERIENCE:

Which of the following equipment have you operated?

- manure loader
- seed drill
- manure spreader
- corn planter
- plow
- cultivator
- disc harrow
- sprayer
- drag harrow
- mower
- rake
- baler
- flail chopper
- blower
- forage harvester
- elevator
- combine
- corn picker

Can you adjust a plow and set draft? ____________________________________________________________________________

mount a cultivator on a tractor? ____________________________________________________________________________

set a seed drill for rate of seeding and fertilizing? ____________________________________________________________________________

set a corn planter for rate of seeding and fertilizing? ____________________________________________________________________________

calibrate a sprayer? ____________________________________________________________________________

What kinds of tractors have you operated, and how much experience have you had with each type? ____________________________________________________________________________

DAIRY EXPERIENCE:

Do you like to work with dairy cattle? ____________________________________________________________________________

Do you milk? ____________________________________________________________________________ Machine ____________________________________________________________________________ Hand ____________________________________________________________________________

What type milking machines have you operated? ____________________________________________________________________________

Breeds with which you have worked: ____________________________________________________________________________

Size of herds: ____________________________________________________________________________ Herd averages: ____________________________________________________________________________

Have you worked with stanchioned herds? ____________________________________________________________________________ Loose housing? ____________________________________________________________________________

Can you balance a grain ration? ____________________________________________________________________________ How do you determine rate of grain feeding? ____________________________________________________________________________

How many pounds of milk should a good cow produce daily? ____________________________________________________________________________

Have you operated a gutter cleaner? ____________________________________________________________________________ silo unloader? ____________________________________________________________________________

feal grinder? ____________________________________________________________________________ automatic feeders? ____________________________________________________________________________

21
OTHER EXPERIENCE:

Hogs: Do you like them? ______. What size hog enterprises have you worked with? ______.
Your past duties with hogs: ______.

Have you castrated pigs? ______. Tended at farrowing? ______.

Poultry: Do you like working with chickens? ______. What size poultry enterprises have you worked with? ______.
Your past duties with poultry: ______.

Beef cattle: Do you like feeding steers? ______. What size beef operations have you worked with? ______.
Your duties with beef cattle: ______.

IF YOU WANT TO HIRE THIS MAN, you may want to reach agreement on the following:

Wage rate: ______. Overtime pay: ______.
Extras: meat milk
fuel electricity

garden

Hours and conditions: ______.
Vacation or time off: ______.

Limits for employees' children: ______.

Livestock, pets, or junk owned by employee: ______.

Value of tenant house for rent: ______.

Farm affairs must be private: ______.

Days to vacate house at termination of employment: ______.

Notice to be given at termination: Employer: ______. Employee: ______.

22
REFERENCE CHECK LIST

(A telephone call will often bring a more accurate appraisal of an applicant than a letter. The following questions can be put to a reference in 2 or 3 minutes. If you prefer to write, just clip one section and send to reference with a stamped, self-addressed envelope.)

Reference or employer: _________________________________ (name)

Did he miss much work? ____________ Often late for work? ____________ Was he dependable? ____________

Have a temper? ____________ Can he supervise other help? ____________

Good attitude? ____________ Neat and orderly? ____________ Would you rehire? ____________

Did he like cows? ____________ Was he a good worker? ____________ Pay his debts? ____________

Why did he leave? ____________ How much did you pay him? ____________

Did he take good care of his housing? ____________ Wife's attitude _________________________________

Reference or employer: _________________________________ (name)

Did he miss much work? ____________ Often late for work? ____________ Was he dependable? ____________

Have a temper? ____________ Can he supervise other help? ____________

Good attitude? ____________ Neat and orderly? ____________ Would you rehire? ____________

Did he like cows? ____________ Was he a good worker? ____________ Pay his debts? ____________

Why did he leave? ____________ How much did you pay him? ____________

Did he take good care of his housing? ____________ Wife's attitude _________________________________

Reference or employer: _________________________________ (name)

Did he miss much work? ____________ Often late for work? ____________ Was he dependable? ____________

Have a temper? ____________ Can he supervise other help? ____________

Good attitude? ____________ Neat and orderly? ____________ Would you rehire? ____________

Did he like cows? ____________ Was he a good worker? ____________ Pay his debts? ____________

Why did he leave? ____________ How much did you pay him? ____________

Did he take good care of his housing? ____________ Wife's attitude _________________________________

Reference or employer: _________________________________ (name)

Did he miss much work? ____________ Often late for work? ____________ Was he dependable? ____________

Have a temper? ____________ Can he supervise other help? ____________

Good attitude? ____________ Neat and orderly? ____________ Would you rehire? ____________

Did he like cows? ____________ Was he a good worker? ____________ Pay his debts? ____________

Why did he leave? ____________ How much did you pay him? ____________

Did he take good care of his housing? ____________ Wife's attitude _________________________________
ADDITIONAL COPIES OF EMPLOYMENT FORMS

The application for farm employment and personal interview check list forms were prepared in cooperation with dairy farmers in all parts of the United States. These forms are made available to Hoard's Dairyman subscribers at cost as another in many services to readers. A set of ten 6-page forms cost $1.15, including handling charges. If you order 50 sets the cost is $4.80; and 100 sets $9.25.

Write:

READER SERVICE
HOARD'S DAIRYMAN
Fort Atkinson, Wisconsin

730
MODULE OF INSTRUCTION

Title - MARKETING FARM PRODUCTS

Description:

Agricultural products are marketed through local buyers, commission firms, cooperatives, auctions, and direct sales.

This module involves students in the study of the marketing procedures of advertising, grading, prices, and distribution. Students will be given an opportunity to select specific farm products and prepare a plan to market them.

Major Divisions or Units of Content

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pricing and Promoting Farm Products</td>
<td>3</td>
</tr>
<tr>
<td>2. Functions of Marketing Agencies</td>
<td>3</td>
</tr>
<tr>
<td>3. Planning to Market Farm Products</td>
<td>1</td>
</tr>
</tbody>
</table>

Revised April, '75
MODULE OF INSTRUCTION

Title - MARKETING FARM PRODUCTS

OBJECTIVES to be obtained:

The student will be able to:

1. Correctly list a minimum of five sources of current farm marketing information.

2. Correctly list a minimum of seven factors affecting the price paid for farm products.

3. Correctly list a minimum of ten common means of promoting farm products.

4. Describe to the instructor's satisfaction, the functions performed by marketing cooperatives, inspection agencies, terminal auctions, commercial buyers, producers, and commission firms in marketing farm products.

5. Correctly list market grades and measures used to determine the grades for five distinct farm products agreed upon by the instructor and student.

6. Prepare to the instructor's satisfaction a written plan of marketing a selected type of farm product including (1) production programs, (2) ages and weights marketed, (3) products marketed, (4) expected costs and returns, (5) five year past market history, (6) other pertinent information such as health regulations.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1. Pricing and Promoting Farm Products</strong></td>
<td><strong>A. Sources of current farm marketing information</strong></td>
</tr>
<tr>
<td><strong>Objective 1.</strong></td>
<td>- Radio reports</td>
</tr>
<tr>
<td>Correctly list a minimum of five sources of current farm marketing information.</td>
<td>- Newspaper reports</td>
</tr>
<tr>
<td></td>
<td>- New York State crop reporting service reports</td>
</tr>
<tr>
<td></td>
<td>- Farm magazine's</td>
</tr>
<tr>
<td></td>
<td>- Attending auctions and markets</td>
</tr>
<tr>
<td></td>
<td>- Discussion with involved individuals</td>
</tr>
<tr>
<td></td>
<td>- Reports from buyers and marketing cooperatives</td>
</tr>
<tr>
<td></td>
<td>- Other</td>
</tr>
<tr>
<td><strong>Objective 2.</strong></td>
<td><strong>A. Factors affecting prices paid for farm products</strong></td>
</tr>
<tr>
<td>Correctly list a minimum of seven factors affecting the price paid for farm products.</td>
<td>- Supply and demand directly or indirectly determine all prices</td>
</tr>
<tr>
<td></td>
<td>- Law of Supply and Demand</td>
</tr>
<tr>
<td></td>
<td>- Factors affecting supply and demand of farm products</td>
</tr>
<tr>
<td></td>
<td>- variations in yields</td>
</tr>
<tr>
<td></td>
<td>- seasonal expectations</td>
</tr>
<tr>
<td></td>
<td>- consumer income levels</td>
</tr>
<tr>
<td></td>
<td>- exports and imports</td>
</tr>
<tr>
<td></td>
<td>- substitutions</td>
</tr>
<tr>
<td></td>
<td>- government controls</td>
</tr>
<tr>
<td></td>
<td>- availability of product</td>
</tr>
<tr>
<td></td>
<td>- consumers taste changes</td>
</tr>
<tr>
<td></td>
<td>- form of the product</td>
</tr>
<tr>
<td></td>
<td>- quality of the product</td>
</tr>
<tr>
<td></td>
<td>- other</td>
</tr>
<tr>
<td></td>
<td>Methods of adjusting to price changes</td>
</tr>
<tr>
<td></td>
<td>- changing products produced</td>
</tr>
<tr>
<td></td>
<td>- changing production schedules</td>
</tr>
<tr>
<td></td>
<td>- changing marketing methods</td>
</tr>
<tr>
<td></td>
<td>- improving quality</td>
</tr>
<tr>
<td></td>
<td>- other</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture discussion to present information</td>
<td>A. Take notes on new information</td>
<td>A. Evaluate students' reports</td>
</tr>
<tr>
<td>B. Student reporting</td>
<td>B. Each student bring in at least one example of marketing information and report to the class. (If the report isn't written, the student may bring in a tape recording)</td>
<td>B. Written test</td>
</tr>
<tr>
<td></td>
<td>C. Students should discuss each type of marketing information in terms of:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Timeliness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Accuracy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>. Availability</td>
<td></td>
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<tr>
<td></td>
<td>. Other</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture discussion to present law of supply and demand</td>
<td>A. Take notes on new information</td>
<td>A. Written test</td>
</tr>
<tr>
<td>B. Group consensus to arrive at factors affecting demand and supply of farm products</td>
<td>B. Use references to determine factors affecting supply and demand of products and report results to class</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Take part in group discussions</td>
<td></td>
</tr>
</tbody>
</table>
### Objectives by Unit

<table>
<thead>
<tr>
<th>Objective 3.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correctly list a minimum of ten common means of promoting farm products.</td>
</tr>
</tbody>
</table>

### Content

<table>
<thead>
<tr>
<th>A. Costs and returns of advertising</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Methods of promoting farm products</td>
</tr>
<tr>
<td>- Packaging</td>
</tr>
<tr>
<td>- Newspapers, magazines, written advertisements</td>
</tr>
<tr>
<td>- Television promotion</td>
</tr>
<tr>
<td>- Radio promotion</td>
</tr>
<tr>
<td>- Farm displays</td>
</tr>
<tr>
<td>- Fair displays</td>
</tr>
<tr>
<td>- Contests (princesses, queens, posters)</td>
</tr>
<tr>
<td>- Billboards</td>
</tr>
<tr>
<td>- Special festivals</td>
</tr>
<tr>
<td>- Special days or weeks</td>
</tr>
<tr>
<td>- Signs on vehicles</td>
</tr>
<tr>
<td>- Special sales or offers</td>
</tr>
<tr>
<td>- Other</td>
</tr>
<tr>
<td>C. Effectiveness of various types of promotion</td>
</tr>
</tbody>
</table>

### Unit 2. Functions of Marketing Agencies

<table>
<thead>
<tr>
<th>Objective 4.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe to the instructor's satisfaction the functions performed by marketing cooperatives, inspection agencies, terminal auctions, commercial buyers, producers, and commission firms in marketing farm products.</td>
</tr>
</tbody>
</table>

### Content

<table>
<thead>
<tr>
<th>A. Roles performed by:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Marketing cooperatives</td>
</tr>
<tr>
<td>- Inspection agencies</td>
</tr>
<tr>
<td>- Livestock auctions</td>
</tr>
<tr>
<td>- Commercial buyers</td>
</tr>
<tr>
<td>- Producers</td>
</tr>
<tr>
<td>- Commission firms</td>
</tr>
<tr>
<td>B. Examples of roles for a cooperative</td>
</tr>
<tr>
<td>- Receive and assemble products</td>
</tr>
<tr>
<td>- Process</td>
</tr>
<tr>
<td>- Transport</td>
</tr>
<tr>
<td>- Sell and buy</td>
</tr>
<tr>
<td>- Distribute to members</td>
</tr>
<tr>
<td>- Fargain</td>
</tr>
<tr>
<td>- Grade</td>
</tr>
<tr>
<td>- Advertise</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture discussion presenting facts on costs and returns of advertising</td>
<td>A. Take notes on new information</td>
<td>A. Evaluate student participation</td>
</tr>
<tr>
<td>B. Student reporting</td>
<td>B. Students find examples of farm product promotion and bring evidence of each type to class</td>
<td>B. Written test</td>
</tr>
<tr>
<td>C. Group consensus on types of farm product advertising in the area</td>
<td>C. Participate in group discussion to determine types of farm product promotion found locally</td>
<td></td>
</tr>
<tr>
<td>D. Guest speaker--co-op public relations person or person from advertising agency</td>
<td>D. Question guest speaker to determine effectiveness of various types of promotion</td>
<td></td>
</tr>
</tbody>
</table>

| Students work in pairs to research roles performed by various agencies, and report their findings to the class | A. Work in teams to determine the roles of the various marketing agencies | A. Evaluate students' reports |
| Field trip(s) to one of agencies providing marketing services | B. Students report findings to class | B. Written test |
| C. Filmstrip | C. Students record information during filmstrip, guest speaker, and/or field trip | |
| D. Guest speaker from one of marketing agencies | | |
### Objectives by Unit

<table>
<thead>
<tr>
<th>Objective 5.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correctly list market grades and measures used to determine the grades for five distinct farm products agreed upon by the instructor and student.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Grades and specifications for grades for farm products</td>
</tr>
<tr>
<td>- Beef</td>
</tr>
<tr>
<td>- Dairy</td>
</tr>
<tr>
<td>- Poultry</td>
</tr>
<tr>
<td>- Sheep</td>
</tr>
<tr>
<td>- Swine</td>
</tr>
<tr>
<td>- Forage crops</td>
</tr>
<tr>
<td>- Fruits</td>
</tr>
<tr>
<td>- Grain crops</td>
</tr>
<tr>
<td>- Vegetables</td>
</tr>
<tr>
<td>- Syrup</td>
</tr>
<tr>
<td>- Lumber</td>
</tr>
<tr>
<td>- Christmas trees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 3. Planning to Market Farm Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 6.</td>
</tr>
<tr>
<td>Prepare to the instructor's satisfaction a written plan of marketing a selected type of farm product including:</td>
</tr>
<tr>
<td>- Production programs</td>
</tr>
<tr>
<td>- Ages and weights marketed</td>
</tr>
<tr>
<td>- Products marketed</td>
</tr>
<tr>
<td>- Expected costs and returns</td>
</tr>
<tr>
<td>- Five year past market history</td>
</tr>
<tr>
<td>- Other pertinent information such as health regulations</td>
</tr>
</tbody>
</table>

<p>| Description and requirements of student's written plan |
| Listing of available references that can be used by students |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture discussion to introduce objective</td>
<td>A. Students can work individually or in small groups to obtain information on grading</td>
<td>A. Written test on grades and specifications</td>
</tr>
<tr>
<td>B. Student selection of grades each will study (minimum of five)</td>
<td>B. Report findings to group</td>
<td></td>
</tr>
<tr>
<td>C. Filmstrips used by group or individuals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Student reporting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Lecture discussion to present information</td>
<td>A. Take notes on procedure to follow</td>
<td>A. Evaluate written plan</td>
</tr>
<tr>
<td>B. Supervised study-research</td>
<td>B. Prepare a farm marketing plan for a farm product or products agreed upon between the student and instructor</td>
<td>B. Evaluate oral report to class</td>
</tr>
<tr>
<td>C. Student reporting</td>
<td>C. Students report findings to class</td>
<td></td>
</tr>
</tbody>
</table>

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RESOURCE MATERIALS

Books -

Bulletins -
Bulletins showing grades and requirements will be useful

Periodicals -
Any periodicals promoting farm products or listing current farm product prices

Audiovisuals -
Filmstrip - Cooperative organizations offering Producers services
Cal-State Polytechnic College, California
- Other filmstrips involving farm product grading
- Market reports
Title - Marketing Livestock Products

DESCRIPTION:

Marketing livestock products is a complex activity. This module will provide the student with specific activities related to a specific type of livestock of principle concern to the student. The law of supply and demand will be studied as well as sources of information on marketing. The student will be involved in the preparation of a marketing report that will indicate past, present and future outlook.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Livestock Prices and Information</td>
<td>3</td>
</tr>
<tr>
<td>2. Livestock Marketing Agencies</td>
<td>2</td>
</tr>
<tr>
<td>3. Livestock Market Grades</td>
<td>1</td>
</tr>
<tr>
<td>4. Marketing Livestock Products</td>
<td>1</td>
</tr>
</tbody>
</table>

Revised 4/75
OBJECTIVES to be obtained:

The student will be able to:

1. Correctly indicate how the law of supply and demand affects price on a written test.
2. List within 10% the current market price for livestock and livestock products.
3. Correctly list five sources of current livestock marketing information.
4. Describe to the instructor's satisfaction, the role performed by marketing cooperatives, inspection agencies, livestock auctions, commercial buyers, producers, and commission firms in marketing livestock.
5. Correctly list the market grades for selected livestock and livestock products.
6. Prepare to the instructor's satisfaction, a written plan of marketing a selected class of livestock and products including: (1) production programs, (2) ages and weights, of marketing, (3) products marketed, (4) expected costs and returns, (5) five year market history.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - Livestock Prices and Information</strong></td>
<td>A. Effects on price as supply and demand changes in a free market system.</td>
</tr>
</tbody>
</table>
| Objective 1 - Correctly indicate how the law of Supply and Demand affects price, on a written test. | B. Other factors affecting price.  
  . Quality  
  . Market regulations  
  . Taxes  
  . Processing  
  . Transportation  
  . Storage |
| Objective 2 - List within 10% the current market price for livestock and livestock products. | A. Understanding market price reports.  
 B. Learning current market prices |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture discussion</td>
<td>A. Take notes on new information.</td>
<td>A. Evaluate students report.</td>
</tr>
<tr>
<td>Supervised study</td>
<td>B. Students find examples of how supply and demand has affected prices of livestock and livestock products.</td>
<td>B. Written test.</td>
</tr>
<tr>
<td>Student reporting</td>
<td>C. Students report their findings to the class.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Students take notes of new information.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Students record prices during a field trip to a livestock auction or stockyards.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Students study prices.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Written test on prices during an established time.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>P. Written test on prices. 10% range should be allowed.</td>
<td></td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
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<td></td>
</tr>
</tbody>
</table>
| Objective 3 - Correctly list five sources of current livestock marketing information. | Sources of current livestock marketing information:  
- Radio reports  
- Newspaper reports  
- New York State crop reporting service reports  
- Breed journals and farm magazines  
- Attending livestock auctions  
- Questioning individuals concerned with livestock marketing  
- Reports from buyers and marketing cooperatives. |

Unit 2 - Livestock Marketing Agencies  
Objective 4 - Describe, to the instructor's satisfaction, the roles performed by marketing cooperatives, inspection agencies, livestock auctions, commercial buyers, producers, and commission firms, in marketing livestock products.  

Roles performed by:  
- Marketing cooperatives  
- Inspection agencies  
- Livestock auctions  
- Commercial buyers  
- Producers  
- Commission firms
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
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<tbody>
<tr>
<td>Lecture discussion</td>
<td>A. Take notes on new information.</td>
<td>A. Evaluate students report.</td>
</tr>
<tr>
<td>Supervised study</td>
<td>B. Students find examples of how supply and demand has affected prices of livestock and livestock products.</td>
<td>B. Written test.</td>
</tr>
<tr>
<td>Student reporting</td>
<td>C. Students report their findings to the class.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lecture discussion</th>
<th>Field trip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervised study</td>
<td></td>
</tr>
<tr>
<td>Field trip</td>
<td></td>
</tr>
</tbody>
</table>

A. Students take notes of new information.
B. Students record prices during a field trip to a livestock auction or stockyards.
C. Students study prices.
D. Written test on prices during an established time.

Written test on prices. 10% range should be allowed.
### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective 3</th>
<th>Correctly list five sources of current livestock marketing information.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Unit 2</th>
<th>Livestock Marketing Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 4</td>
<td>Describe, to the instructor's satisfaction, the roles performed by marketing cooperatives, inspection agencies, livestock auctions, commercial buyers, producers, and commission firms, in marketing livestock products.</td>
</tr>
</tbody>
</table>

### CONTENT

- **Sources of current livestock marketing information:**
  - Radio reports
  - Newspaper reports
  - New York State crop reporting service reports
  - Breed journals and farm magazines
  - Attending livestock auctions
  - Questioning individuals concerned with livestock marketing
  - Reports from buyers and marketing cooperatives

- **Roles performed by:**
  - Marketing Cooperatives
  - Inspection Agencies
  - Livestock auctions
  - Commercial buyers
  - Producers
  - Commission firms
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture Discussion</td>
<td>A. Take notes on new information</td>
<td>A. Evaluate students reports</td>
</tr>
<tr>
<td>Student reporting</td>
<td>B. Each student bring in at least one example of the market reports, and report his findings to the class. (If the report isn't written he may wish to bring in a tape recording.)</td>
<td>B. Written test</td>
</tr>
<tr>
<td>Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student reports</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filmstrip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guest speaker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field trip</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Take notes on new information</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Work in teams to determine the roles of the various marketing agencies.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Students report findings to the class.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D. Take notes of information during guest speaker, field trip, or filmstrip.</td>
<td></td>
</tr>
</tbody>
</table>

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7
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Unit 3 - Livestock Market Grades Objective 5 - Correctly list the market grades for selected livestock and livestock products. | Livestock and livestock product grades and brief descriptions  
- Milk classes  
- Steer and heifer grades  
- Slaughter grades for cows  
- Slaughter grades for bulls  
- Calf grades  
- Purebred dairy classification  
- Sheep grades - bothc sa, spring, yearling, mutton  
- Wool grades  
- Hog grades  
- Poultry grades  
- Egg grades |

| Unit 4 - Marketing Livestock Products Objective 6 - Prepare to the instructor's satisfaction a written plan of marketing a selected class of livestock and products including: | A. Description and requirements of written plan  
B. Listing of available references that can be used  
- Production programs  
- Ages and weights when marketed  
- Products marketed  
- Expected costs and returns  
- Five year market history |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture discussion</td>
<td>A. Students take notes of new information</td>
<td>Written test on grades</td>
</tr>
<tr>
<td>Filmstrips</td>
<td>B. Each student or team of students finds grades and descriptions for assigned livestock</td>
<td></td>
</tr>
<tr>
<td>Supervised study</td>
<td>C. Students report findings to the class</td>
<td></td>
</tr>
<tr>
<td>Student reporting</td>
<td></td>
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</tr>
</tbody>
</table>

Lecture Discussion
Supervised study
Student reporting

A. Take notes of procedures to follow
B. Prepare a livestock marketing plan for selected livestock and products
C. Report finished plan to class

A. Evaluate plan
B. Evaluate report made by student

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MODULE OF INSTRUCTION

Title - Marketing Livestock Products
Code -01.010405-02

RESOURCE MATERIALS


Audiovisuals -

Filmstrip - Cooperative Organizations Offering Producers Services - California State Polytechnic College San Luis Obispo, California
SAMPLE QUIZ

Marketing Livestock Products

Indicate whether price increases, remains the same, or decreases for each of the following:

1. Supply increases as demand remains the same.
2. Demand increases as supply increases.
3. Demand increases as supply decreases.
4. Supply decreases as demand remains the same.
5. Supply decreases as demand decreases.
6. Supply increases faster than demand.
7. Demand decreases as supply increases.
8. Supply increases slower than demand.
9. Supply decreases slower than demand.
10. Supply and demand remain the same.

2. Indicate the current market price for each of the following, 10% error allowed.
   - Choice steers
   - Choice calves
   - U.S. No. 2 butcher hogs
   - Choice lambs
   - Handling dairy cows
   - Grade A medium eggs
   - Dairy slaughter cattle
   - Boars
   - Slaughter ewes
   - Feeder pigs (each)

3. List six sources of current livestock marketing information.
   - 
   - 
   - 
   - 
   - 
   - 
SAMPLE QUIZ

Marketing Livestock Products

List the market grades for each of the following:
1. Milk classes with description
   1.
   2.
   3.
   4.
2. Steer and heifer grades
   1.
   2.
   3.
   4. Standard
   5.
   6. Utility
   7.
   8. Canned
3. Meat Birds
   1.
   2.
   3.
   4.
4. Swine Grades
   1.
   2.
   3.
   4.
   5. Cull
5. Lamb Grades
   1.
   2.
   3.
   4.
   5.
6. Egg Grades
   1.
   2.
   3.
   4.
7. Holstein classification
   1.
   2.
   3.
   4.
   5.
   6.
MODULE OF INSTRUCTION

Title - Starting A Farm Business

Code - 01.010406-01

DESCRIPTION:

The selection of a farm enterprise is based largely on the types of land available, market outlets in the area, and the interests and skills of the owner. Following the selection of the farm enterprise, students are involved in the selection of suitable farms with proper elevation, topography, adequate acreage, and buildings to meet the farm needs. Upon selection of a farm, students enrolled in this module will develop skills in the selection of credit sources and how to maintain good ratings. Students will also become involved in methods that can be used to become established in a farm business. Students will select enterprises that should be successful when given specific land resources.

Divisions or Units of Content

<table>
<thead>
<tr>
<th>Time Allocations</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Selection of a Farm</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>2. Ways of Getting Established in Farming</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>3. Obtaining Financial Backing and Establishing Credit</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>17</td>
</tr>
</tbody>
</table>

Revised June '75
MODULE OF INSTRUCTION

Title - Starting A Farm Business

OBJECTIVES to be obtained:

The Student Will Be Able To:

1. Using class references, list and define the four major factors influencing the selection of a farm enterprise.

2. Given a situation, select and justify to the instructor's satisfaction, enterprises for a farm business based on the four major selection factors studied in class.

3. Given references, develop a complete check list of the factors to consider in selecting a farm.

4. Using the check list developed in class, evaluate to the instructor's satisfaction, three farms in terms of factors on the list.

5. Using information supplied from the field trips outlined in objective 4, select and justify to the instructor's satisfaction, the best one of the three farms in terms of the check list developed in objective 3.

6. Using references supplied by the instructor, select, describe and compare five different ways of becoming established in farming.

7. Using information developed in objective 6 (with references supplied as needed), select and justify to the instructor's satisfaction, the one way of acquiring ownership best suited to his situation.

8. Given a situation, determine the types and amounts of machinery and livestock needed to operate a farm business.

9. For a given situation, calculate the capital needed for purchasing machinery, livestock and real estate for starting a farm business - using reference material supplied by the instructor.

10. Using references supplied by the instructor, identify and define the types of credit available for use in starting a farm business.

11. Using reference material, select four sources of credit and determine what sources to use for short-term and long-term credit.

12. Using references assigned in class, and for a given situation, prepare an outline showing anticipated expansion plans for the future in terms of land, buildings, machinery and livestock.
### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 1 - The Selection of a Farm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1 Using class references, the student will list and define the 4 major factors influencing the selection of a farm enterprise.</td>
</tr>
</tbody>
</table>

| Objective 2 Given a situation, select and justify to the instructors satisfaction, enterprises for a farm business based on the 4 major selection factors studied in class. |

### CONTENT

<table>
<thead>
<tr>
<th>A. Definition of a farm enterprise</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Factors in selecting a farm enterprise</td>
</tr>
<tr>
<td>Types of land available</td>
</tr>
<tr>
<td>soil productivity</td>
</tr>
<tr>
<td>acreage</td>
</tr>
<tr>
<td>Market outlets</td>
</tr>
<tr>
<td>Economic considerations</td>
</tr>
<tr>
<td>Intensive in providing sufficient productive man work units.</td>
</tr>
<tr>
<td>Comparative return per unit of enterprise.</td>
</tr>
<tr>
<td>Personal interests and skills.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>A. Types of enterprises.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Livestock</td>
</tr>
<tr>
<td>cows</td>
</tr>
<tr>
<td>heifers</td>
</tr>
<tr>
<td>hens</td>
</tr>
<tr>
<td>chicks</td>
</tr>
<tr>
<td>Field crops</td>
</tr>
<tr>
<td>forage</td>
</tr>
<tr>
<td>corn-silage</td>
</tr>
<tr>
<td>corn-grain</td>
</tr>
<tr>
<td>small grains</td>
</tr>
<tr>
<td>other</td>
</tr>
<tr>
<td>Cash crops and fruit</td>
</tr>
<tr>
<td>apples</td>
</tr>
<tr>
<td>cherries</td>
</tr>
<tr>
<td>grapes</td>
</tr>
<tr>
<td>potatoes</td>
</tr>
<tr>
<td>snap beans for processing</td>
</tr>
<tr>
<td>other</td>
</tr>
</tbody>
</table>

| B. Situation - Select enterprises necessary to provide work for 2 men for a farm that produces a product marketable in New York (in area selected) with description of acreage and type of land - instructors choice. Assume buildings are sufficient for the enterprises selected and that markets are available. |

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### TEACHING METHODS

| A. Class discussion—use of blackboard & supervised study |
| B. List 10 major and 10 minor enterprises in New York State. Discuss each enterprise and possible combinations. |

| A. Class discussion—chalk and board |
| B. Field trip—with field trip guide—list of questions. Visit two farms with differing combination of enterprises. Suggestions: Dairy farm, Poultry farm, Heifer raising farm, Cash crop farm |
| C. Supervised study |

### STUDENT APPLICATION ACTIVITIES

| A. Take note as outlined by instructor |
| B. Break up into groups of four for discussion of an assigned factor; report findings to class. |
| C. Each student will receive written definitions of 4 factors. |

| A. Take note as outlined by instructor |
| B. Field trip: Students ask questions assigned by instructor from list developed in class. Take notes to be used in writing a report on selection of enterprises for the situation outlined under Content B |
| C. Write report of enterprises selected based on situation given. Students present reports in class and lead discussion. |

### EVALUATION PROCEDURES

| A. Students will list the four major factors influencing the selection of farm enterprises, |
| A. Upon completion of a field trip students will write a report on the enterprises of the farms visited. Students will comment on the enterprises and make any recommendations for changes. |
| B. Students report discussed in class. The instructor will base the grade on 50% written report and 50% for discussion and answering questions. |
### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective 3</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Given references, develop a complete checklist of the factors to consider in selecting a farm. | A. Factors to consider in selecting a farm  
   - Acreage  
   - Location  
   - Climate  
   - Topography  
   - Soils  
   - Timber  
   - Layout  
   - Water supply  
   - Residences  
   - Barns  
   - Other |
| Objective 4 | B. Farm Buildings |
| Using the checklist developed in class, evaluate to the instructors satisfaction, three farms in terms of factors on the list. | A. Type of farms to evaluate  
   - Farm with limited potential  
     - limited due to size, productivity of land, other; may be no longer in commercial farming and might be purchased for a comparatively low price.  
   - Farm with average potential  
     - farm about average in size and productivity  
   - Farm with excellent potential  
     - farm above average in size; well managed |
| Objective 5 | |
| Using information supplied from the field trips outlined in Objective 4, select and justify to the instructors satisfaction, the best one of the three farms in terms of the checklist developed in Objective 3. | A. A farm with limited potential  
   B. A farm with average potential  
   C. A farm with excellent potential |
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>A. Student will develop on paper a checklist - using information supplied by teacher.</td>
<td>A. Short quiz</td>
</tr>
<tr>
<td>B. Use of blackboard &amp; chalk</td>
<td></td>
<td>Given 5 of the facts from the checklist - explain how they effect the success or failure of a farm.</td>
</tr>
<tr>
<td>C. Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Students fill out checklists provided by instructor for each farm visited. If possible get the value of each farm (what they would be worth if sold) market value.</td>
<td>A. Students written evaluation sheets of 3 farms discussed in class and on field trips.</td>
</tr>
<tr>
<td></td>
<td>B. Students visit town clerk office and look up assessments and taxes paid by the farmers.</td>
<td></td>
</tr>
<tr>
<td>A. Field trips with students</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>A. During discussion - students answer questions asked by the instructor regarding the 3 farms.</td>
<td>A. Grade based on oral answers.</td>
</tr>
<tr>
<td>Taking notes.</td>
<td>B. Write a report indicating the farm he would select and why. Also include any modifications.</td>
<td>B. Written report on farm selected - with reasons and any recommendations regarding limitations.</td>
</tr>
<tr>
<td>A. Class discussion (with emphasis on points to consider when buying a farm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Supervised study</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Student oral reports</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 2 - Ways of Getting Established in Farming</strong></td>
<td>A. Ways of getting established in farming</td>
</tr>
<tr>
<td><strong>Objective 6</strong></td>
<td>A. Ways of getting established in farming</td>
</tr>
<tr>
<td>Using references supplied by the instructor, describe and compare five different</td>
<td>A. Inheritance or gift</td>
</tr>
<tr>
<td>ways of becoming established in farming.</td>
<td>- birth</td>
</tr>
<tr>
<td></td>
<td>- marriage</td>
</tr>
<tr>
<td></td>
<td>- Use of savings from non-farm work</td>
</tr>
<tr>
<td></td>
<td>- Agricultural ladder</td>
</tr>
<tr>
<td></td>
<td>- Father-son partnerships</td>
</tr>
<tr>
<td></td>
<td>- Use of borrowed funds</td>
</tr>
<tr>
<td></td>
<td>- Contract farming</td>
</tr>
<tr>
<td></td>
<td>- Corporation shares</td>
</tr>
<tr>
<td></td>
<td>A. Factors influencing the way of getting started in farming</td>
</tr>
<tr>
<td></td>
<td>- Presence of the 7 types in the community</td>
</tr>
<tr>
<td></td>
<td>- Resources of student</td>
</tr>
<tr>
<td></td>
<td>- money available</td>
</tr>
<tr>
<td></td>
<td>- equity in livestock &amp; machinery</td>
</tr>
<tr>
<td></td>
<td>- Type of enterprises selected</td>
</tr>
<tr>
<td></td>
<td>- Personal preferences</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unit 3 - Obtaining Financial Backing and Establishing Credit</strong></td>
<td>A. Machinery needs and values</td>
</tr>
<tr>
<td><strong>Objective 8</strong></td>
<td>- New</td>
</tr>
<tr>
<td>Given a situation, determine the types and amounts of machinery and livestock</td>
<td>- Used</td>
</tr>
<tr>
<td>needed to operate a farm business.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Livestock</td>
</tr>
<tr>
<td></td>
<td>- Cows</td>
</tr>
<tr>
<td></td>
<td>- Heifer replacements</td>
</tr>
<tr>
<td></td>
<td>C. Crops needs</td>
</tr>
<tr>
<td></td>
<td>- 60 acres hay</td>
</tr>
<tr>
<td></td>
<td>- 40 acres corn for grain</td>
</tr>
<tr>
<td></td>
<td>- 40 acres corn for silage</td>
</tr>
</tbody>
</table>

759
<table>
<thead>
<tr>
<th><strong>TEACHING METHODS</strong></th>
<th><strong>STUDENT APPLICATION ACTIVITIES</strong></th>
<th><strong>EVALUATION PROCEDURES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>Students will use the references</td>
<td>Written report of 5 ways</td>
</tr>
<tr>
<td>B. Supervised study.</td>
<td>and write down and explain 5 ways</td>
<td>of getting established in</td>
</tr>
<tr>
<td>C. Teacher could cite</td>
<td>of getting started in farming.</td>
<td>farming.</td>
</tr>
<tr>
<td>examples of how some</td>
<td>Have the student report on one of</td>
<td></td>
</tr>
<tr>
<td>young and adult</td>
<td>the 5 ways to the class.</td>
<td></td>
</tr>
<tr>
<td>farmers become</td>
<td></td>
<td></td>
</tr>
<tr>
<td>established in the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>school district.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| A. Class discussion  | A. Involve students in discussion | A. Basis of discussion in |
| B. Supervised study. | by asking for examples of neigh-| class (Bonus points).    |
|                      | bors or relatives who have star-|                          |
|                      | ted a farm business.            |                          |
|                      | B. Using problem solving method | B. Student will turn in  |
|                      | have student develop a written | a written report explain- |
|                      | plan showing how he might get   | ing a way he might get    |
|                      | started in farming.             | started in farming.      |
|                      |                                  | And the reasons for his   |
|                      |                                  | method.                  |

| A. Class discussion  | A. With guidance from the instruc-| A. Student reports will |
| B. Supervised study. | tor, the student will develop a  | be discussed in class.  |
|                      | written list of machinery and    | B. Students will have    |
|                      | livestock (type and amount) for  | the option to set up an  |
|                      | the farm situation given.        | ideal farm outlining     |
|                      |                                  | cow heifers, replacements, |
|                      |                                  | cropping acreage, machi- |
|                      |                                  | nery, & equipment inven- |
|                      |                                  | tory for a specific Farm |
|                      |                                  | Business.                |
|                      | C. The class and the instructor  | C. The class and the     |
|                      | will ask the student questions   | instructor will ask      |
|                      | on his Ideal Farm.              | the student questions    |
|                      |                                  | on his Ideal Farm.       |
## Objectives by Unit

### Objective 9
For a given situation, calculate the capital needed for purchasing machinery, livestock and real estate for starting a farm business using reference material supplied by the instructor.

<table>
<thead>
<tr>
<th><strong>CONTENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Capital required</strong></td>
</tr>
<tr>
<td>- Machinery</td>
</tr>
<tr>
<td>- new</td>
</tr>
<tr>
<td>- used</td>
</tr>
<tr>
<td>- Livestock</td>
</tr>
<tr>
<td>- Real estate</td>
</tr>
</tbody>
</table>

### Objective 10
Using references supplied by the instructor, identify and define the types of credit available for use in starting a farm business.

<table>
<thead>
<tr>
<th><strong>CONTENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Types of credit</strong></td>
</tr>
<tr>
<td>- Merchants or dealers</td>
</tr>
<tr>
<td>- Individuals</td>
</tr>
<tr>
<td>- Commercial banks</td>
</tr>
<tr>
<td>- Insurance companies</td>
</tr>
<tr>
<td>- Production credit association</td>
</tr>
<tr>
<td>- Farm and home administration</td>
</tr>
<tr>
<td>- Federal land bank</td>
</tr>
</tbody>
</table>

### Objective 11
Using reference material, select sources of credit and determine what sources to use for short term and long term credit.

<table>
<thead>
<tr>
<th><strong>CONTENT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A. Uses of credit</strong></td>
</tr>
<tr>
<td>- Real estate mortgage - long term credit</td>
</tr>
<tr>
<td>- amount</td>
</tr>
<tr>
<td>- annual</td>
</tr>
<tr>
<td>- Non-real estate credit - short term credit</td>
</tr>
<tr>
<td>- amount</td>
</tr>
<tr>
<td>- annual interest</td>
</tr>
</tbody>
</table>

**Situation**
- Real estate mortgage for $25,000
- Non-real estate loan for $20,000
### TEACHING METHODS

- **A.** Class discussion
- **B.** Blackboard
- **C.** Supervised study
  - Use published prices from auctions
  - Have farm machinery dealer speak to students on machinery and equipment needs and prices.

### STUDENT APPLICATION ACTIVITIES

- **A.** Have the students contact resource person to obtain prices for all items in Objective 9.

### EVALUATION PROCEDURES

- **A.** Students will prepare an inventory on all items in Objective 9.
- **B.** Prices will be calculated for all items, grades will be determined by completeness and accuracy of the inventory.

### TEACHING METHODS

- **A.** Supervised study
- **B.** Guest resource person
  - Production credit representative
  - Local banker

### STUDENT APPLICATION ACTIVITIES

- **A.** Using reference material the students will write and explain the types of credit that he would use in becoming established in a farm business.

### EVALUATION PROCEDURES

- **A.** Students will be given a written exam on the types of credit.
- **B.** Students will select the sources of credit for short term and long term capital.

### TEACHING METHODS

- **A.** Class discussion
- **B.** Use of blackboard
- **C.** Supervised study
- **D.** Work out interest cost for various types of loans.

### STUDENT APPLICATION ACTIVITIES

- **A.** Student will work out a problem given by instructor to learn how to figure interest. Calculate the interest for the given situation.
  - Short term
  - Long term
  - Discounts

### EVALUATION PROCEDURES

- **A.** Written exam on sources of credit.
- **B.** Written exam on interest calculations.
### Objectives by Unit

**Unit 4** - Long range planning for future land, buildings, machinery and livestock needs.

**Objective 12**

Using references assigned in class, and for a given situation, prepare an outline showing anticipated expansion plans for the future in terms of land, buildings, machinery and livestock.

<table>
<thead>
<tr>
<th><strong>Content</strong></th>
<th><strong>A. Factors to Consider</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Future plans</td>
</tr>
<tr>
<td></td>
<td>partnership or single ownership (one or two families to support)</td>
</tr>
<tr>
<td></td>
<td>Anticipated rising costs</td>
</tr>
<tr>
<td></td>
<td>Planned growth - expansion</td>
</tr>
<tr>
<td></td>
<td>Outlook for enterprises in the future</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>B. Factors related to:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
</tr>
<tr>
<td>Buildings</td>
</tr>
<tr>
<td>Machinery</td>
</tr>
<tr>
<td>Livestock</td>
</tr>
</tbody>
</table>

---

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12
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Class discussion</td>
<td>A. The student will, after proper orientation, use references to outline a plan for the future for given situation in terms of four factors listed under content.</td>
<td>A. Student will turn in the written report. (Basis for oral report)</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Student will give an oral report to the class regarding future plans.</td>
<td>B. Instructor will evaluate oral and written reports for a grade and make constructive comments regarding the reports.</td>
</tr>
<tr>
<td></td>
<td>C. Student oral reports</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. The student will, after proper orientation, use references to outline a plan for the future for given situation in terms of four factors listed under content.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Student will give an oral report to the class regarding future plans.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Students will make out written outlines to complete the requirements of Objective 12.</td>
<td></td>
</tr>
</tbody>
</table>
RESOURCE MATERIALS

A. Books -

Teacher References.


Student References.


B. Bulletins

Teacher References.

A.E.Ext. 571 Agricultural Situation and Outlook, 110 pps.
A.E.Res. 163 Credit Used by New York State Dairymen, 51 pps.
A.E.Res. 292 A Regional Summary Of United States Farming, 78 pps.

Student References.

A.E.Ext. 568 Buying a Farm on Contract 15 nps.
A.E.Ext. 331 The Financial Lease 12 pps.
A.E.Res. 332 Dairy Farm Management 36 pp
A.E.Res. 308 Farm Cost Accounts - Field Crops, 18 pps.
Leaflet No. 432 USDA Where and How to Get a Farm 7 pps.
Principles of Agricultural Finance, Farm Credit Service 64 pps.
A.E.Ext. 517
A.E.Ext. 514 1967 Sheep Summary
E861 Farm Partnership Arrangements 15 pps.
E1016 Incorporation of the Farm Business 19 pps.
Toward the Year 1985 - No. 1 Milk Production and Consumption 22 pps.
Toward the Year 1985 - No. 2 Field Crops 25 pps.
Toward the Year 1985 - No. 3 Sheep, Hogs and Beef 12 pps.
Toward the Year 1985 - No. 7 Fruit Production & Utilization 25 pps.
toward the Year 1985 - No.10 Capital & Labor 18 pps.

C. Audio - Visuals

An Economic Classification of Farms by Areas - Map
Soil Maps - Local Soil Conservation Office

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MODULE OF INSTRUCTION

Title - REORGANIZING A FARM BUSINESS Code 01.010406-02

DESCRIPTION:

Student will study problems in the farm business and the making of adjustments to them. Farm production, size, labor efficiency, enterprise emphasis and capital distribution are principal indicators of farm business efficiency and productivity.

Following an evaluation of the farm enterprise, the student will develop a list of priorities for improving the factors limiting business. Decisions affecting the future of the farm operations will be based on efficiency of management, changes in farm technology and of labor availability.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class</td>
</tr>
<tr>
<td>1. Identify Resources Available to the Farmer</td>
<td>2</td>
</tr>
<tr>
<td>2. Evaluating the Farm Enterprise and Identifying Problem Areas</td>
<td>6</td>
</tr>
<tr>
<td>3. Establishing Priorities to Correct Business Deficiencies</td>
<td>6</td>
</tr>
<tr>
<td>4. Planning for Future Business Change</td>
<td>4</td>
</tr>
</tbody>
</table>

Revised June 1974

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MODULE OF INSTRUCTION

Title - REORGANIZING A FARM BUSINESS

Objectives to be obtained:

The student will be able to:

1. List four resources available to farmers and discuss the importance of each resource.

2. Given a local situation with specific resources available to the farmer, explain how these resources are interrelated and can affect a farm business.

3. Correctly enter and tally one month's expenses and receipts using the Cornell Farm Account Book.

4. List the assets and liabilities of a given farm business.

5. Locate production levels in a given farm business using the Cornell Farm Business Chart.

6. Make a list of factors that will affect change in a farm business. Make priority rankings for the farm business.

7. Given a farm business problem, list, to the teacher's satisfaction, the areas requiring change and the ways you would go about introducing changes.
## Title - REORGANIZING A FARM BUSINESS

### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 1 - Identify Resources Available to the Farmer.</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1 List four resources available to farmers and discuss the importance of each resource.</td>
<td>A. Resources available to the farmer</td>
</tr>
<tr>
<td></td>
<td>. Land</td>
</tr>
<tr>
<td></td>
<td>. Capital</td>
</tr>
<tr>
<td></td>
<td>. Buildings</td>
</tr>
<tr>
<td></td>
<td>. Labor</td>
</tr>
<tr>
<td></td>
<td>. Management</td>
</tr>
<tr>
<td></td>
<td>. Markets</td>
</tr>
</tbody>
</table>

Objective 2  
Given a local situation with specific resources available to the farmer, explain how these resources are interrelated and can affect a farm business.
### TEACHING METHODS

| A. | Use resource people to speak to the class regarding resources   |
|    | . SCS                                                           |
|    | . Bankers                                                      |
|    | . Marketing personnel                                         |
| B. | Overhead projector transparencies on all resources.           |
| C. | Filmstrips on resources.                                      |
| D. | Class discussion on soils classification.                     |
| E. | Study a soils map of a farm in the school district.           |
| F. | Field trip to discuss land classes.                           |

### STUDENT APPLICATION ACTIVITIES

| A. | Students will list the types of agricultural enterprises that could be carried out in a given area determined by the resources available. |
| B. | Set up a soils judging contest tied into the unit so that students could appreciate the value of land as one of our basic resources. |
| C. | FFA land judging contest on the local, district, state, and national levels. |

### EVALUATION PROCEDURES

| A. | Students will list four resources available to farmers and briefly explain the importance of each resource listed. Essay question. |
| B. | Students could study the resources available and list the types of farming enterprises that could be profitable in a given area. |
| C. | Students could explore alternate uses of resources if limitations exist for agricultural purposes. |

---

A. Provide students with sample farms, listing all resources available.
B. Have students study and analyze the farm including resources.
C. Students discuss how the resources are being handled and other alternatives that can improve the farm business.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Unit 2 - Evaluating the Farm Enterprise and Identifying Problem Areas. | A. Expense account for one month in the Cornell Cash Account Booklet  
  - Labor  
  - Feed  
  - Oil and gas  
  - Breeding fee  
  - Vet expenses  
  - Other expense items  
B. Receipts for one month  
  - Milk sold  
  - Crops sold  
  - Culled cows  
  - Calves  
  - Other possible receipts |
| Objective 3 Correctly enter and tally one month's expenses and receipts using the Cornell Farm Account Book. | |
| Objective 4 List the assets and liabilities of a given farm business. | A. Assets  
B. Liabilities  
C. Inventory  
D. Net worth |

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Pass out handout sheet on farm business expenses and receipts for a month.</td>
<td>A. Have students fill out pages two and three of the Cornell Cash Account Booklet and have student correctly tally one month's expenses. Do this in a lab session.</td>
<td>A. Check cash account booklet to see if information is entered correctly and tallied correctly.</td>
</tr>
<tr>
<td>B. Supervised study.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Class discussion.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| A. Invite extension agent or a banker as a speaker to discuss the importance of keeping an accurate farm inventory. | A. Students ask questions on the value of an inventory. | A. Students will be graded on a written test prepared on objective. |
| B. Class discussion led by the instructor on how to interpret and use asset-liability data to make sound farm management decisions. | B. Students take an inventory on the home farm or cooperative farm. | B. Grade the student on Farm Inventory Book project. |
| C. Supply students with Cornell Farm Inventory Books. Explain the purpose of and methods used to take a farm inventory. | | C. Written quiz on farm inventory and net worth statement of an operating farm. |
| D. Complete net worth statement of a sample farm. | | |
Title - REORGANIZING A FARM BUSINESS

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 3 - Establishing Priorities to Correct Business Deficiencies.</td>
<td>A. Farm Business Chart</td>
</tr>
<tr>
<td>Objective 5 Locate production levels in a given farm business using the Cornell Farm Business Chart.</td>
<td>Levels of production</td>
</tr>
<tr>
<td></td>
<td>Mean or average levels of production in New York State</td>
</tr>
<tr>
<td></td>
<td>Farm production indexes: pounds of milk produced per man, pounds of milk produced per cow and labor income, and other comparative evaluations.</td>
</tr>
<tr>
<td>Unit 4 - Planning for Future Business Change.</td>
<td>A. Crop efficiency</td>
</tr>
<tr>
<td>Objective 6 Make a list of factors that will affect change in a farm business. Make priority rankings for the farm business.</td>
<td>B. Livestock efficiency</td>
</tr>
<tr>
<td></td>
<td>C. Labor and equipment efficiency</td>
</tr>
<tr>
<td></td>
<td>D. Farm Business Chart</td>
</tr>
<tr>
<td></td>
<td>Areas of strength</td>
</tr>
<tr>
<td></td>
<td>Areas of weaknesses</td>
</tr>
<tr>
<td></td>
<td>Recommended changes</td>
</tr>
<tr>
<td>Objective 7 Given a farm business problem, list, to the teacher's satisfaction, the areas requiring change and the ways you would go about introducing changes.</td>
<td>A. Farm business problem</td>
</tr>
<tr>
<td></td>
<td>Read and analyze</td>
</tr>
<tr>
<td></td>
<td>Establish alternatives</td>
</tr>
<tr>
<td></td>
<td>Reasons for choosing alternatives</td>
</tr>
</tbody>
</table>

Agricultural
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Pass out latest farm business</td>
<td>A. Students will individually calculate man work</td>
<td>A. Check on each student to see if they are</td>
</tr>
<tr>
<td>chart and a farm business handout</td>
<td>equivalents, man work units, production per man,</td>
<td>making calculations correctly.</td>
</tr>
<tr>
<td>for a given farm business. Use</td>
<td>production per cow, gross income per cow and labor</td>
<td></td>
</tr>
<tr>
<td>overhead projector to show</td>
<td>income.</td>
<td></td>
</tr>
<tr>
<td>students where to locate production</td>
<td>B. Field trip report.</td>
<td></td>
</tr>
<tr>
<td>levels and to calculate indexes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Use sample farms in the school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>district for class discussion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Prepare students for a farm visit. Spell out the purpose of the farm visit.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Farm visit. Pass out farm</td>
<td>A. Students make an analysis of the farm business</td>
<td>A. Day after visit students review farm</td>
</tr>
<tr>
<td>business chart and have students</td>
<td>or a sample farm for extra credit and FFA contest.</td>
<td>business chart, calculate indexes.</td>
</tr>
<tr>
<td>fill out while on farm visit. Be</td>
<td>B. Students ask questions using the farm business</td>
<td>Written report.</td>
</tr>
<tr>
<td>sure that the farm visited has</td>
<td>chart as a guide.</td>
<td>B. Make recommendations to improve the farm</td>
</tr>
<tr>
<td>current, accurate figures available</td>
<td>C. Students fill out farm business chart.</td>
<td>business. The grade will be determined by the</td>
</tr>
<tr>
<td>for the students.</td>
<td></td>
<td>quality of the report and supportive reasons</td>
</tr>
<tr>
<td>B. Supervised study of efficiency</td>
<td></td>
<td>for recommendations.</td>
</tr>
<tr>
<td>factors.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Teacher gives the student a</td>
<td>A. Student analyzes problem and calculates</td>
<td></td>
</tr>
<tr>
<td>given problem related to a</td>
<td>indexes. Makes recommendations.</td>
<td></td>
</tr>
<tr>
<td>farm business.</td>
<td>B. Students compare a report on the home farm or</td>
<td></td>
</tr>
<tr>
<td>B. Students prepare oral reports</td>
<td>C. Classroom discussion led by student giving</td>
<td></td>
</tr>
<tr>
<td>that will identify problems and</td>
<td>report.</td>
<td></td>
</tr>
<tr>
<td>alternatives.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Classroom discussion led by</td>
<td></td>
<td></td>
</tr>
<tr>
<td>student giving report.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A. Day after visit students review farm business chart, calculate indexes. Written report.
B. Make recommendations to improve the farm business. The grade will be determined by the quality of the report and supportive reasons for recommendations.

A. Student is graded on completed module packet.
B. Letter grade is given on the basis of a written exam and oral presentation.
Title - REORGANIZING A FARM BUSINESS

RESOURCE MATERIALS

Books
Profitable Farm Management Hamilton and Bryant, 2nd Ed., 1963
Profit Maximizing Principles OSU 1970 (Cornell IMS)

Booklets
Planning A Profitable Farm Business, Cornell IMS
Agricultural Business Management, Principles That Affect Production
Cornell IMS

Audiovisuals
Farm Management Film Series, Cornell Film Library, 3 films, 45 min. each
Agricultural Resources in New York State, Cornell Film Library, 35 min.

Other
Class visit to a farm business
Class visit by a banker
Farm business problems made up by teacher

Note: The Cornell Farm Business Chart and a Farm Business Problem are included in this module as a part of the unit, however, a teacher may set up his own farm business problem.
FARM BUSINESS CHART

TOTAL ACRES IN THE FARM

FARM OF __________________________ ACRES OF TILLABLE LAND

Success in farming is the result of many factors. Farm business studies show that the most important factors under the farmer's control are size of business, production rates of crops and animals, labor efficiency and selection of enterprises.

The chart below shows the range of the experience of commercial farmers in New York with respect to size of business, production rates and labor efficiency.

The figure at the top of each column is the median of the highest ten per cent of the farms in that factor. For example, the figure at the top of the column headed "Tons of Hay" is the median of the ten per cent of the farms with the highest yield of hay. The other figures in the column are the medians for the next ten per cent, "the 10 per cent below that," and so forth. The figure at the bottom of the column is the median of the ten per cent of the farms with the lowest yield of hay.

Each of the columns is independent of the others. The figure at the top of the column headed "Tons of Corn Silage" is the median of the ten per cent of the farms with the highest yield of corn silage.

<table>
<thead>
<tr>
<th>Hay, Silage, Grain Yields per Acre</th>
<th>Vegetable Yields per Acre</th>
<th>Fruit Yields per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tons of Hay</strong></td>
<td><strong>Tons of Corn Silage</strong></td>
<td><strong>Bu. of Corn</strong></td>
</tr>
<tr>
<td>3.8</td>
<td>22</td>
<td>120</td>
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<tr>
<td>3.0</td>
<td>19</td>
<td>100</td>
</tr>
<tr>
<td>2.7</td>
<td>19</td>
<td>90</td>
</tr>
<tr>
<td>2.4</td>
<td>16</td>
<td>83</td>
</tr>
<tr>
<td>2.2</td>
<td>15</td>
<td>78</td>
</tr>
<tr>
<td>2.1</td>
<td>14</td>
<td>73</td>
</tr>
<tr>
<td>1.9</td>
<td>13</td>
<td>65</td>
</tr>
<tr>
<td>1.7</td>
<td>12</td>
<td>55</td>
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<tr>
<td>1.5</td>
<td>11</td>
<td>45</td>
</tr>
<tr>
<td>1.2</td>
<td>8</td>
<td>30</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Dairy Farms</th>
<th>Labor</th>
<th>Poultry Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cows</td>
<td>Pounds of Milk Sold</td>
<td>Pounds Milk Sold per Cow</td>
</tr>
<tr>
<td>95</td>
<td>1,000,000</td>
<td>14,500</td>
</tr>
<tr>
<td>60</td>
<td>640,000</td>
<td>12,350</td>
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<tr>
<td>50</td>
<td>530,000</td>
<td>11,200</td>
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<td>42</td>
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<td>10,900</td>
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<td>39</td>
<td>400,000</td>
<td>10,300</td>
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<tr>
<td>36</td>
<td>355,000</td>
<td>9,700</td>
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<tr>
<td>32</td>
<td>315,000</td>
<td>9,000</td>
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<td>28</td>
<td>265,000</td>
<td>8,100</td>
</tr>
<tr>
<td>24</td>
<td>210,000</td>
<td>7,300</td>
</tr>
<tr>
<td>20</td>
<td>150,000</td>
<td>6,000</td>
</tr>
</tbody>
</table>

HOW TO USE THIS CHART

1. Draw lines in each column to show the rank of the farm business being studied. For example, if the farm produced 57 bushels of oats per acre, draw a line in the "Oats" column between the 56 and 60.
2. Draw heavy lines so that you can see them easily.
3. Do not draw lines for factors which are of only minor importance on the farm being studied.

PREPARED BY E. W. WARE, DEPARTMENT OF AGRICULTURAL ECONOMICS, NEW YORK STATE COLLEGE OF AGRICULTURE, ITHACA, NEW YORK, FEBRUARY, 1920
INTRODUCTION and INSTRUCTIONS

Everyone of us is challenged to improve his managerial ability. This means developing our skills in making good business decisions. This problem is designed to give you practice in analyzing a farm business and in thinking through some of the choices open to a farmer and his son.

Information about a farmer and his family and the home farm is given in this booklet. Several choices are being considered. After you have studied this information, your teacher will supply you with an entry blank on which you may indicate your evaluation of the four alternatives.

By

C.A. Bratton E.L. LaDue
G.W. Loomis, G.J. Conneman
THE FAMILY and THE FARM

The Family

Gary Lane is 18 years old and a freshman in the Agricultural and Technical College. He took vocational agriculture in high school. Two years ago, Gary decided that he wanted to farm when he completed his education.

Gary's father is 44 years old and in excellent health. He bought the "home" farm of 120 acres on contract in 1949. In 1958, they bought a 69 acre farm across the road. Mr. Lane is active in farm organizations.

Mrs. Lane, who is a business institute graduate, keeps the farm records. She is active in the local 4-H Club and the PTA. Only in emergencies does she help with the farm work.

Gary has an older sister who will graduate from college in June. She plans to be a teacher. A younger sister is a freshman in high school.

The Lane's goal is to operate a farm business that will enable them to have a comfortable home, educate the children, and take part in community affairs.

The Farm

The farm, which was formerly two units, consists of 189 acres with 150 tillable. The soil is in the Honeoye-Lima association. The barn on the home farm, built in 1939, was remodeled inside in 1960 and now has stanchions for 40 cows; heifer and calf pens; a box stall; and a 12 x 14 milk house. There is a 16 x 50 concrete silo.

The 34 x 60 barn across the road has 20 wood stanchions, horse stalls, calf pens, and a 12 x 30 wood silo. The house is in good repair and has been rented by the same family since 1960.
The Labor Force

Mr. Lane has always done most of the work himself, only hiring day help during the summer. Since Gary started in high school, the two of them have done all the work.

The Machinery

Major items include one small and two large tractors, a truck, baler, chopper, hay conditioner, an elevator, grain combine, gutter cleaner, silo unloader, a ten-can cooler, and the usual tillage and dairy equipment.

The Livestock

There were 24 cows on the farm when Gary's father bought it. He has gradually increased to about 40 milkers and 20 heifers. Gary owns 3 of the cows and 4 heifers.

Financial Situation

There is a $5,200 balance on the $20,000 farm mortgage which was obtained in 1958 to pay off the balance of the contract and buy the second farm. Mr. Lane always aims to keep a good balance in his checking account so that he can pay cash for current purchases.

Farm Business Records

In 1950, the Lanes joined a three-year Extension farm account club. They have kept the Cornell Farm Account and Farm Inventory Books ever since. Gary used the records in his Vo-Ag work. In view of Gary's plans to farm, the family enrolled in the Extension Farm Business Management Project in 1966. Their business summary is on the next page.
1966 FARM BUSINESS SUMMARY

Farm located in Central New York State. Honeoye-Lima soils. Total acres in farm 189, cropland 150 acres, woods 20 acres, and permanent pasture 8 acres, farmstead, etc. 11 acres.

CAPITAL INVESTMENT

<table>
<thead>
<tr>
<th></th>
<th>1/1/66</th>
<th>1/1/67</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery &amp; equipment</td>
<td>$10,030</td>
<td>$10,995</td>
</tr>
<tr>
<td>Livestock</td>
<td>14,500</td>
<td>14,575</td>
</tr>
<tr>
<td>Feed &amp; supplies</td>
<td>3,996</td>
<td>4,536</td>
</tr>
<tr>
<td>Land &amp; buildings</td>
<td>35,000</td>
<td>35,000</td>
</tr>
<tr>
<td>TOTAL INVESTMENT</td>
<td>$63,526</td>
<td>$65,106</td>
</tr>
</tbody>
</table>

EXPENSES

Dairy concentrate $ 4,763
Labor, unpaid (5 mo.) 1,000
Gas and oil 683
Machinery repairs 707
Bale ties 166
Milk hauling 737
Machine hire 606
Auto expense (farm share) 235
Electricity (farm share) 335
Breeding fees 268
Veterinary, medicine 518
Other livestock expense 473
Fertilizer and lime 1,392
Seeds and plants 392
Spray and other 256
Land, building, fence repair 698
Taxes 731
Insurance 385
Telephone 89
Miscellaneous 220
New machinery 2,805
Purchased livestock 600
TOTAL FARM EXPENSES $18,059

CROPS GROWN

<table>
<thead>
<tr>
<th>Crop</th>
<th>Acres</th>
<th>Yield</th>
<th>Total Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay</td>
<td>84</td>
<td>2.7</td>
<td>227 tons</td>
</tr>
<tr>
<td>Corn silage</td>
<td>13</td>
<td>17</td>
<td>221 tons</td>
</tr>
<tr>
<td>Grain corn</td>
<td>9</td>
<td>83</td>
<td>747 bu.</td>
</tr>
<tr>
<td>Oats</td>
<td>22</td>
<td>58</td>
<td>1,278 bu.</td>
</tr>
<tr>
<td>Wheat</td>
<td>22</td>
<td>38</td>
<td>836 bu.</td>
</tr>
<tr>
<td>TOTAL</td>
<td>150</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

RECEIPTS

Milk sales $23,349
Livestock sold 2,418
Crop sales 1,277
Government payments 346
Gas tax refund 140
Cash rent (house) 540
Miscellaneous 151
Total Cash Receipts $28,221
Increase in Inventory 1,580
TOTAL FARM RECEIPTS $29,801

FINANCIAL SUMMARY

Total Farm Receipts $29,801
Total Farm Expenses 18,059
Farm Income $11,742
Interest at 5% 3,216
LABOR INCOME $8,526

BUSINESS FACTORS

Man equivalent 1.4
Number of cows 39
Number of heifers 20
Lbs. of milk sold 483,700
Average test of milk 3.7%
ANALYZING THE FARM BUSINESS

1. A Farm Business Chart has been inserted in this booklet. Using the data provided on page 4, fill out both sides of the chart.

2. Some farm business factors are listed below for a group of 673 New York dairy farms in 1965. An average for all the farms is given in the first column and an average for the 10 percent of the farms with the highest labor incomes is presented in the second column. The third column is designed to help you analyze the Lane farm business. Some of the items have been calculated and are filled in. You are to figure the other factors. Then study this farm business.

(The 673 dairy farms in the Farm Business Management Projects are considerably better than the average for all farms in the State.)

Comparisons of Farm Business Factors

<table>
<thead>
<tr>
<th>Business Factor</th>
<th>673 N. Y. Dairy Farms, 1965</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average of all 673 farms</td>
</tr>
<tr>
<td>Capital Investment (end of year)</td>
<td></td>
</tr>
<tr>
<td>Capital per cow</td>
<td>$1,565</td>
</tr>
<tr>
<td>Machinery investment per cow</td>
<td>$335</td>
</tr>
<tr>
<td>Machinery Costs</td>
<td></td>
</tr>
<tr>
<td>Net machinery cost*</td>
<td>$5,104</td>
</tr>
<tr>
<td>Net machinery cost per cow</td>
<td>$116</td>
</tr>
<tr>
<td>Rates of Production and Feed Costs</td>
<td></td>
</tr>
<tr>
<td>Lbs. milk sold per cow</td>
<td>11,900</td>
</tr>
<tr>
<td>Percent feed bought is of milk receipts</td>
<td>29%</td>
</tr>
<tr>
<td>Feed bought per cow**</td>
<td>$154</td>
</tr>
<tr>
<td>Heifers per 10 cows</td>
<td>6.1</td>
</tr>
<tr>
<td>Average Price per cwt. Milk Sold</td>
<td>$4.41</td>
</tr>
</tbody>
</table>

* Includes depreciation, repairs, gas and oil, interest, milk hauling, custom machine hire, farm share of auto, bale ties, and farm share of electricity, less gas tax refund and income from machine work.

** Includes feed for replacement heifers.

780
The Farm Business

After studying a farm business by examining the strong and weak points, one can better clarify one's thinking about strengths and weaknesses in the farm business.

<table>
<thead>
<tr>
<th>EVALUATION</th>
<th>Weak</th>
<th>Satisfactory</th>
<th>Very Good</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop yields</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal production</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of business</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labor efficiency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital investment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machinery costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Feed costs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Manager

The "manager" is an important part of any business. In evaluating a farm situation, it is important to include an analysis of the "manager" of the business. Place a check mark under yes or no for the questions below.

- Is the manager clear on his goal?  Yes  No
- Has he had experience with hired help?  Yes  No
- Does he like to take risks?  Yes  No
- Is his debt situation sound?  Yes  No
- Has he made reasonable progress?  Yes  No
THE SITUATION AND PROBLEM

The Lanes are looking ahead to when Gary finishes college next year. They have decided to form a partnership and realize that it takes time to develop plans and get changes into operation.

Recently, the local milk cooperative where the Lanes sell their milk, has been discussing the possibility of going to all milk. A suggested target date for this change is July 1968.

Gary and his father have been discussing their present situation, their goals, and possible things which they might do. Their general objective is to develop a business that will provide a reasonable living for two families. At present, they have four alternatives under serious consideration. They have assembled information and prepared budgets (pages 8-13). The problem is to decide which is the best alternative for the future.

Alternative 1 - Concentrate on getting the debts paid off. Look for a milk plant that will continue to take can milk. Continue the present herd management practices. Clean up the sugar equipment which has been stored since 1958 and bring sugar bush (400 trees) back into production.

Alternative 2 - Convert heifer pens to stanchions and increase herd to 50 cows; enlarge milk house for bulk tank, purchase a dumping station; move heifers to barn across the road.

Alternative 3 - Construct a new 150-cow free-stall system with double-six herringbone parlor on knoll across the road. Use old barn on home farm for young cattle. Erect two 30 x 60 concrete silos with automated handling and go to a high corn silage feeding program. Cash rent neighboring farm with 80 acres of cropland (rents now for $1,500).

Alternative 4 - Convert present barn to a 75-cow free-stall system (build on with pole construction), erect a new 20 x 60 silo, install a double-three herringbone milking parlor, and increase the level of silage feeding.
SUPPLEMENTAL INFORMATION AND ANALYSIS OF ALTERNATIVES

Alternative 1 - Tap Maple Trees - Get Out of Debt

Mr. Lane operated the sugar bush until 1958. He hung two buckets per tree and averaged about 0.25 gallons of syrup per bucket. The equipment that has been stored is adequate and will require only cleaning and annual maintenance. They cut their own fuel. Containers, repairs and other miscellaneous expenses would be about $100 per year. Syrup has averaged about $4 per gallon for the last few years.

Milk hauling to the new plant will be 25¢ instead of the present 15¢.

Projected Farm Business Summary

<table>
<thead>
<tr>
<th>CAPITAL INVESTMENT</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery &amp; equipment</td>
<td>$10,995</td>
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<tr>
<td>Livestock</td>
<td>14,575</td>
</tr>
<tr>
<td>Feed &amp; supplies</td>
<td>4,536</td>
</tr>
<tr>
<td>Land &amp; buildings</td>
<td>35,000</td>
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<tr>
<td><strong>TOTAL INVESTMENT</strong></td>
<td>$65,106</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPENSES</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy concentrate</td>
<td>$ 4,763</td>
</tr>
<tr>
<td>Labor</td>
<td>0</td>
</tr>
<tr>
<td>Gas &amp; oil</td>
<td>683</td>
</tr>
<tr>
<td>Machinery repairs</td>
<td>707</td>
</tr>
<tr>
<td>Bale ties</td>
<td>170</td>
</tr>
<tr>
<td>Milk hauling</td>
<td>1,210</td>
</tr>
<tr>
<td>Machine hire</td>
<td>606</td>
</tr>
<tr>
<td>Machinery depreciation</td>
<td>1,900</td>
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<tr>
<td>Auto expense (farm share)</td>
<td>275</td>
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<tr>
<td>Electricity (farm share)</td>
<td>335</td>
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<tr>
<td>Breeding fees</td>
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<td>Veterinary, medicine</td>
<td>518</td>
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<tr>
<td>Other livestock expense</td>
<td>473</td>
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<tr>
<td>Fertilizer &amp; lime</td>
<td>1,392</td>
</tr>
<tr>
<td>Seeds &amp; plants</td>
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<tr>
<td>Spray &amp; other</td>
<td>256</td>
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<tr>
<td>Syrup supplies</td>
<td>100</td>
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<td>Land, building, fence repair</td>
<td>698</td>
</tr>
<tr>
<td>Taxes</td>
<td>731</td>
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<tr>
<td>Insurance</td>
<td>385</td>
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<tr>
<td>Telephone</td>
<td>89</td>
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<tr>
<td>Miscellaneous</td>
<td>220</td>
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<tr>
<td><strong>TOTAL FARM EXPENSES</strong></td>
<td>$16,171</td>
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</table>

<table>
<thead>
<tr>
<th>CROPS GROWN</th>
<th>Crop</th>
<th>Acre.</th>
<th>Yield</th>
<th>Total Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay</td>
<td>84</td>
<td>3</td>
<td></td>
<td>252 tons</td>
</tr>
<tr>
<td>Corn silage</td>
<td>13</td>
<td>15</td>
<td></td>
<td>195 tons</td>
</tr>
<tr>
<td>Corn grain</td>
<td>9</td>
<td>80</td>
<td></td>
<td>720 bu.</td>
</tr>
<tr>
<td>Oats</td>
<td>22</td>
<td>60</td>
<td></td>
<td>1,320 bu.</td>
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<tr>
<td>Wheat</td>
<td>22</td>
<td>40</td>
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<td>880 bu.</td>
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<tr>
<td><strong>Total</strong></td>
<td></td>
<td>150</td>
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<table>
<thead>
<tr>
<th>RECEIPTS</th>
<th></th>
<th></th>
<th></th>
<th>$26,897</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk sales @ $4.50 per cwt.</td>
<td>$21,767</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livestock sold</td>
<td>2,418</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crop sales</td>
<td>1,277</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maple syrup</td>
<td>800</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>635</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL FARM RECEIPTS</strong></td>
<td>$26,897</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>FINANCIAL SUMMARY</th>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Total farm receipts</td>
<td>$26,897</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total farm expenses</td>
<td>16,171</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Farm Income</td>
<td>$10,726</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest at 5%</td>
<td>3,216</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>LABOR INCOME/farm</td>
<td>$ 7,510</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LABOR INCOME/operator</td>
<td>$ 3,755</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>BUSINESS FACTORS</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Man equivalent</td>
<td>2.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of cows</td>
<td>39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of heifers</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gallons syrup sold</td>
<td>200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lbs. milk sold</td>
<td>483,700</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price received for milk</td>
<td>$4.50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Alternative 2 - Increase Herd to 50 Cows

An ell on the present barn is now used for calves and heifers. Some pens could be removed and ten stanchions put in. There would still be room for the small calves. The larger heifers would be moved to the barn across the road. A short shuttle-stroke gutter cleaner, which would push the manure from these ten cows into the existing cleaner, would be installed. The Lanes would enlarge the milk house and buy a bulk tank and a dumping station.

The total cost of making this change is estimated to be $9,875. This cost includes: remodeling the stable, enlarging the milk house, a 700-gallon bulk tank, dumping station, 10 cows and 3 yearlings (to provide replacement for the 10 cows).

Projected Farm Business Summary

<table>
<thead>
<tr>
<th>CAPITAL INVESTMENT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery &amp; equipment</td>
<td>$12,000</td>
</tr>
<tr>
<td>Livestock</td>
<td>18,600</td>
</tr>
<tr>
<td>Feed &amp; supplies</td>
<td>5,500</td>
</tr>
<tr>
<td>Land &amp; buildings</td>
<td>35,800</td>
</tr>
<tr>
<td><strong>TOTAL INVESTMENT</strong></td>
<td>$71,900</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPENSES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy concentrate</td>
<td>$ 6,783</td>
</tr>
<tr>
<td>Labor</td>
<td>0</td>
</tr>
<tr>
<td>Gas &amp; oil</td>
<td>800</td>
</tr>
<tr>
<td>Machinery repairs</td>
<td>900</td>
</tr>
<tr>
<td>Bale ties</td>
<td>250</td>
</tr>
<tr>
<td>Milk hauling</td>
<td>0</td>
</tr>
<tr>
<td>Machine hire</td>
<td>225</td>
</tr>
<tr>
<td>Machinery depreciation</td>
<td>2,200</td>
</tr>
<tr>
<td>Auto expense (farm share)</td>
<td>325</td>
</tr>
<tr>
<td>Electricity (farm share)</td>
<td>475</td>
</tr>
<tr>
<td>Breeding fees</td>
<td>340</td>
</tr>
<tr>
<td>Veterinary, medicine</td>
<td>650</td>
</tr>
<tr>
<td>Other livestock expense</td>
<td>800</td>
</tr>
<tr>
<td>Fertilizer &amp; lime</td>
<td>1,500</td>
</tr>
<tr>
<td>Seeds &amp; plants</td>
<td>400</td>
</tr>
<tr>
<td>Spray &amp; other</td>
<td>260</td>
</tr>
<tr>
<td>Land, building, fence repair</td>
<td>800</td>
</tr>
<tr>
<td>Taxes</td>
<td>760</td>
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<tr>
<td>Insurance</td>
<td>455</td>
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<td>Telephone</td>
<td>110</td>
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<tr>
<td>Miscellaneous</td>
<td>350</td>
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<tr>
<td><strong>TOTAL FARM EXPENSES</strong></td>
<td>$18,383</td>
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</table>

<table>
<thead>
<tr>
<th>CROPS GROWN</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop Acres Yield Total Crop</td>
<td></td>
</tr>
<tr>
<td>Hay 110 3 330 tons</td>
<td></td>
</tr>
<tr>
<td>Corn silage 13 15 195 tons</td>
<td></td>
</tr>
<tr>
<td>Oats 20 60 1,200 bu</td>
<td></td>
</tr>
<tr>
<td>Corn grain 7 75 525 bu</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong> 150</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RECEIPTS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk sales</td>
<td>$27,900</td>
</tr>
<tr>
<td>Livestock sold</td>
<td>2,900</td>
</tr>
<tr>
<td>Crop sales</td>
<td>0</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>700</td>
</tr>
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<td><strong>TOTAL FARM RECEIPTS</strong></td>
<td>$31,500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FINANCIAL SUMMARY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Farm Receipts</td>
<td>$31,500</td>
</tr>
<tr>
<td>Total Farm Expenses</td>
<td>18,383</td>
</tr>
<tr>
<td>Farm Income</td>
<td>$13,117</td>
</tr>
<tr>
<td>Interest at 5%</td>
<td>3,595</td>
</tr>
<tr>
<td>LABOR INCOME/farm</td>
<td>$ 9,522</td>
</tr>
<tr>
<td>LABOR INCOME/operator</td>
<td>$ 4,761</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BUSINESS FACTORS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Man equivalent</td>
<td>2.0</td>
</tr>
<tr>
<td>Number of cows</td>
<td>50</td>
</tr>
<tr>
<td>Number of heifers</td>
<td>25</td>
</tr>
<tr>
<td>Lbs. milk sold per cow</td>
<td>12,400</td>
</tr>
<tr>
<td>Lbs. milk sold</td>
<td>620,000</td>
</tr>
<tr>
<td>Price received for milk</td>
<td>$4.50</td>
</tr>
</tbody>
</table>
Alternative 3 - Financing the Change

Financing is an important consideration when planning a major change in a business. Below are forms which can be used in considering the financing. The calculations have been made for the Lane's financing of Alternative 3.

**How Much Will They Need to Borrow?**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total estimated additional investment</td>
<td>$128,725</td>
</tr>
<tr>
<td>Amount of debt now outstanding</td>
<td>$5,200</td>
</tr>
<tr>
<td>Total Amount Needed</td>
<td>$133,925</td>
</tr>
</tbody>
</table>

**How Much Can They Borrow?**

Commercial lenders have guides that are used in making loans. Below are the calculations for this proposed operation.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Real Estate</td>
<td>$65,000 x 2/3 = $43,300</td>
</tr>
<tr>
<td>Value Livestock &amp; Equipment</td>
<td>$79,400 x 1/2 = $39,700</td>
</tr>
<tr>
<td>Probable Total Maximum Loan</td>
<td>$83,000</td>
</tr>
</tbody>
</table>

**Can They Make the Payments?**

The amount available for debt repayment can be calculated from the projected farm business summary figures. The debt payments required on the amount needed also can be figured. The calculations for Alternative 3 are below.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cash Receipts</td>
<td>$88,700</td>
</tr>
<tr>
<td>Total Cash Expenses</td>
<td>$57,585</td>
</tr>
<tr>
<td>Cash Operating Income</td>
<td>$31,115</td>
</tr>
<tr>
<td>Less: Estimated Cash Living Cost</td>
<td>$9,000</td>
</tr>
<tr>
<td>Annual Maximum Available for Debt Payment</td>
<td>$22,115</td>
</tr>
</tbody>
</table>

**Payments Required (6% interest rate)**

<table>
<thead>
<tr>
<th>Kind of Debt</th>
<th>Thousand Dollars of Debt</th>
<th>Factor</th>
<th>Monthly Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Yr. Real Estate Mortgage</td>
<td>43</td>
<td>$7.20</td>
<td>$310</td>
</tr>
<tr>
<td>5 Yr. Chattel Lien</td>
<td>40</td>
<td>$19.50</td>
<td>$780</td>
</tr>
<tr>
<td>Other debt (5 yr.)</td>
<td>51</td>
<td>$19.50</td>
<td>$995</td>
</tr>
<tr>
<td>Total Monthly Payments</td>
<td></td>
<td></td>
<td>$2,085</td>
</tr>
</tbody>
</table>

Total monthly payments $2,085 x 12 = $25,020 annual payments required.
Alternative 3 - New 150-Cow Free-Stall System

Gary and his father think free-stall systems look promising. They could construct a new 150-cow unit across the road and use the existing barns for heifers. A complete silage roughage program would be adopted for the cows. Heifers would be fed hay and silage.

The neighboring farm which can be cash rented has Honeoye-Lima soil which is in a good state of fertility. By growing only roughage crops and fertilizing well, the Lanes believe they can grow the silage needed for 150 cows and the young stock. They would buy some hay. The present line of machinery would be adequate.

The estimated additional investment for this plan is $128,725. This includes $67,200 for buildings and silos, $13,400 for equipment and $48,125 for cattle.

Projected Farm Business Summary

<table>
<thead>
<tr>
<th>CAPITAL INVESTMENT</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery &amp; equipment</td>
<td>$16,700</td>
<td>Livestock</td>
<td>62,700</td>
</tr>
<tr>
<td>Feed &amp; supplies</td>
<td>15,000</td>
<td>Land &amp; buildings</td>
<td>65,000</td>
</tr>
<tr>
<td>TOTAL INVESTMENT</td>
<td>$159,400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXPENSES</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy concentrate</td>
<td>$25,800</td>
<td>Hay (90 tons)</td>
<td>2,700</td>
</tr>
<tr>
<td>Hired labor (1 man &amp; house rent)</td>
<td>6,000</td>
<td>Gas &amp; oil</td>
<td>1,400</td>
</tr>
<tr>
<td>Machinery repairs</td>
<td>1,800</td>
<td>Bale ties</td>
<td>75</td>
</tr>
<tr>
<td>Milk hauling</td>
<td>0</td>
<td>Machine hire</td>
<td>0</td>
</tr>
<tr>
<td>Machinery depreciation</td>
<td>3,300</td>
<td>Auto expense (farm share)</td>
<td>400</td>
</tr>
<tr>
<td>Electricity (farm share)</td>
<td>1,400</td>
<td>Breeding fees</td>
<td>1,035</td>
</tr>
<tr>
<td>Veterinary, medicine</td>
<td>1,950</td>
<td>Other livestock expense</td>
<td>2,200</td>
</tr>
<tr>
<td>Fertilizer &amp; lime</td>
<td>2,900</td>
<td>Seeds &amp; plants</td>
<td>675</td>
</tr>
<tr>
<td>Spray &amp; other</td>
<td>950</td>
<td>Land, building, fence repair</td>
<td>1,400</td>
</tr>
<tr>
<td>Taxes</td>
<td>1,525</td>
<td>Insurance</td>
<td>1,275</td>
</tr>
<tr>
<td>Rent of farm</td>
<td>1,600</td>
<td>Telephone</td>
<td>200</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>500</td>
<td>TOTAL FARM EXPENSES</td>
<td>$57,585</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CROPS GROWN</th>
<th>Acres</th>
<th>Yield</th>
<th>Total Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay crop</td>
<td>70</td>
<td>9.0</td>
<td>630 tons</td>
</tr>
<tr>
<td>Corn silage</td>
<td>140</td>
<td>15</td>
<td>2,100 tons</td>
</tr>
<tr>
<td>Oat silage</td>
<td>20</td>
<td>7.5</td>
<td>150 tons</td>
</tr>
<tr>
<td>TOTAL</td>
<td>230</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RECEIPTS</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk sales</td>
<td>$81,000</td>
<td>Livestock sold</td>
<td>6,500</td>
</tr>
<tr>
<td>Crop sales</td>
<td>0</td>
<td>Miscellaneous</td>
<td>1,200</td>
</tr>
<tr>
<td>TOTAL FARM RECEIPTS</td>
<td>$88,700</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FINANCIAL SUMMARY</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Farm Receipts</td>
<td>$88,700</td>
<td>Total Farm Expenses</td>
<td>57,585</td>
</tr>
<tr>
<td>Farm Income</td>
<td>$31,115</td>
<td>Interest at 5%</td>
<td>7,970</td>
</tr>
<tr>
<td>LABOR INCOME/farm</td>
<td>$23,145</td>
<td>LABOR INCOME/operator</td>
<td>$11,572</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BUSINESS FACTORS</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Man equivalent</td>
<td>3.0</td>
<td>Number of cows</td>
<td>150</td>
</tr>
<tr>
<td>Number of heifers</td>
<td>75</td>
<td>Lbs. milk sold per cow</td>
<td>12,000</td>
</tr>
<tr>
<td>Lbs. milk sold</td>
<td>1,800,000</td>
<td>Price received for milk</td>
<td>$4.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TOTAL</td>
<td>736</td>
</tr>
</tbody>
</table>

22
Alternative 4 - Convert Barn to 75-Cow Free-Stall System.

The fourth alternative being considered is to increase the herd to 75 cows by converting the existing barn to free stalls and adding a bunk-free stall addition. This addition would be made to the end of the barn so that it could be conveniently added to later. A double-three herringbone parlor would be constructed. Adding a 20 x 60 silo would allow them to feed hay crop and oat silage during the summer and corn silage and hay during the winter. The barn across the road would house all the heifers. The ell on the present barn would be used as an isolation and maternity area and for calves.

The estimated investment required to make this change is $49,225. This includes $27,700 for buildings and silo, $6,300 for equipment and $15,225 for cattle.

Projected Farm Business Summary

**CAPITAL INVESTMENT**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery &amp; equipment</td>
<td>$13,200</td>
</tr>
<tr>
<td>Livestock</td>
<td>29,800</td>
</tr>
<tr>
<td>Feed &amp; supplies</td>
<td>8,000</td>
</tr>
<tr>
<td>Land &amp; buildings</td>
<td>50,000</td>
</tr>
<tr>
<td><strong>TOTAL INVESTMENT</strong></td>
<td>$101,000</td>
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**CROPS GROWN**

<table>
<thead>
<tr>
<th>Crop</th>
<th>Acres</th>
<th>Yield</th>
<th>Total Crop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay</td>
<td>50</td>
<td>3.0</td>
<td>150 tons</td>
</tr>
<tr>
<td>Hay crop silage</td>
<td>30</td>
<td>9.0</td>
<td>270 tons</td>
</tr>
<tr>
<td>Corn silage</td>
<td>50</td>
<td>15</td>
<td>750 tons</td>
</tr>
<tr>
<td>Oats</td>
<td>20</td>
<td>7.5</td>
<td>150 tons</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>150</td>
</tr>
</tbody>
</table>

**EXPENSES**

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy concentrate</td>
<td>$12,900</td>
</tr>
<tr>
<td>Hired labor</td>
<td>0</td>
</tr>
<tr>
<td>Gas &amp; oil</td>
<td>825</td>
</tr>
<tr>
<td>Machinery repairs</td>
<td>900</td>
</tr>
<tr>
<td>Bale ties</td>
<td>150</td>
</tr>
<tr>
<td>Milk hauling</td>
<td>0</td>
</tr>
<tr>
<td>Machine hire</td>
<td>0</td>
</tr>
<tr>
<td>Machinery depreciation</td>
<td>2,500</td>
</tr>
<tr>
<td>Auto expense (farm share)</td>
<td>300</td>
</tr>
<tr>
<td>Electricity (farm share)</td>
<td>700</td>
</tr>
<tr>
<td>Breeding fees</td>
<td>515</td>
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<tr>
<td>Veterinary, medicine</td>
<td>975</td>
</tr>
<tr>
<td>Other livestock expense</td>
<td>1,000</td>
</tr>
<tr>
<td>Fertilizer &amp; lime</td>
<td>1,600</td>
</tr>
<tr>
<td>Seeds &amp; plants</td>
<td>400</td>
</tr>
<tr>
<td>Spray &amp; other</td>
<td>400</td>
</tr>
<tr>
<td>Land, building, fence repair</td>
<td>1,050</td>
</tr>
<tr>
<td>Taxes</td>
<td>1,075</td>
</tr>
<tr>
<td>Insurance</td>
<td>770</td>
</tr>
<tr>
<td>Telephone</td>
<td>150</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>600</td>
</tr>
<tr>
<td><strong>TOTAL FARM EXPENSES</strong></td>
<td>$26,810</td>
</tr>
</tbody>
</table>

**RECEIPTS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk sales</td>
<td>$40,500</td>
</tr>
<tr>
<td>Livestock sold</td>
<td>4,400</td>
</tr>
<tr>
<td>Crop sales</td>
<td>0</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>800</td>
</tr>
<tr>
<td><strong>TOTAL FARM RECEIPTS</strong></td>
<td>$45,700</td>
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</table>

**FINANCIAL SUMMARY**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Farm Receipts</td>
<td>$45,700</td>
</tr>
<tr>
<td>Total Farm Expenses</td>
<td>$26,810</td>
</tr>
<tr>
<td>Farm Income</td>
<td>$18,890</td>
</tr>
<tr>
<td>Interest at 5%</td>
<td>5,050</td>
</tr>
<tr>
<td>LABOR INCOME/farm</td>
<td>$13,840</td>
</tr>
<tr>
<td>LABOR INCOME/operator</td>
<td>$6,920</td>
</tr>
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</table>

**BUSINESS FACTORS**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Man equivalent</td>
<td>2.0</td>
</tr>
<tr>
<td>Number of cows</td>
<td>75</td>
</tr>
<tr>
<td>Number of heifers</td>
<td>38</td>
</tr>
<tr>
<td>Acres of crops</td>
<td>150</td>
</tr>
<tr>
<td>Lbs. milk sold per cow</td>
<td>12,000</td>
</tr>
<tr>
<td>Lbs. milk sold</td>
<td>900,000</td>
</tr>
<tr>
<td>Price received for milk</td>
<td>$4.50</td>
</tr>
</tbody>
</table>
Alternative 4 - Financing the Change

How Much Will They Need to Borrow?

- Total estimated additional investment: $49,225
- Amount of debt now outstanding: $5,200
- Total Amount Needed: $54,425

How Much Can They Borrow?

- Value Real Estate: $50,000 \times \frac{2}{3} = 33,333$
- Value Livestock & Equipment: $43,000 \times \frac{1}{2} = 21,500$
- Probable Total Maximum Loan: $54,800

Can They Make the Payments?

Amount Available for Debt Repayment

- Total Cash Receipts: $45,700
- Total Cash Expenses: $26,810
- Cash Operating Income: $18,890
- Less: Estimated Cash Living Cost: $9,000
- Annual Maximum Available for Debt Payment: $9,890

Payments required (6% interest rate)

<table>
<thead>
<tr>
<th>Kind of Debt</th>
<th>Thousand Dollars of Debt</th>
<th>Factor</th>
<th>Monthly Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Yr. Real Estate Mortgage</td>
<td>33</td>
<td>$7.20</td>
<td>$238</td>
</tr>
<tr>
<td>5 Yr. Chattel Lien</td>
<td>21</td>
<td>$19.50</td>
<td>410</td>
</tr>
<tr>
<td>Other debt (5 yr.)</td>
<td>0</td>
<td>$19.50</td>
<td>0</td>
</tr>
</tbody>
</table>

Total Monthly Payments

Total monthly payments $648 \times 12 = $7,776 annual payments required
### WORK UNITS FOR LIVESTOCK AND CROPS

#### LIVESTOCK

<table>
<thead>
<tr>
<th>Item</th>
<th>Number or acres on this farm</th>
<th>Work units per head or per acre</th>
<th>Total work units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy Cows</td>
<td>X</td>
<td>7.5</td>
<td></td>
</tr>
<tr>
<td>Beef Cows</td>
<td>X</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Heifers</td>
<td>X</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Hens (production only)</td>
<td>X</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Egg processing (per doz.)</td>
<td>X</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td>Pullets raised</td>
<td>X</td>
<td>0.004</td>
<td></td>
</tr>
<tr>
<td>Broilers raised</td>
<td>X</td>
<td>0.003</td>
<td></td>
</tr>
<tr>
<td>Brood sows</td>
<td>X</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Hogs raised</td>
<td>X</td>
<td>0.15</td>
<td></td>
</tr>
<tr>
<td>Ewes</td>
<td>X</td>
<td>0.5</td>
<td></td>
</tr>
</tbody>
</table>

#### CROPS

<table>
<thead>
<tr>
<th>Item</th>
<th>Number or acres on this farm</th>
<th>Work units per head or per acre</th>
<th>Total work units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hay</td>
<td>X</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>Corn Silage</td>
<td>X</td>
<td>0.8</td>
<td></td>
</tr>
<tr>
<td>Corn for grain</td>
<td>X</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Oats</td>
<td>X</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>X</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Dry beans</td>
<td>X</td>
<td>1.5</td>
<td></td>
</tr>
<tr>
<td>Potatoes</td>
<td>X</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Cabbage</td>
<td>X</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Snap beans for processing</td>
<td>X</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Onions</td>
<td>X</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Apples—growing</td>
<td>X</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Apples—harvest—per bushel</td>
<td>X</td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>

#### OTHER

<table>
<thead>
<tr>
<th>Item</th>
<th>Number or acres on this farm</th>
<th>Work units per head or per acre</th>
<th>Total work units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work off farm, days</td>
<td>X</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Marketing</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TOTAL WORK UNITS

<table>
<thead>
<tr>
<th>Item</th>
<th>Number or acres on this farm</th>
<th>Work units per head or per acre</th>
<th>Total work units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total pounds of milk sold</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total pounds of milk sold</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of cows</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total dozens of eggs sold</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of hens</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total lbs. of feed for laying flock</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### MAN EQUIVALENT

<table>
<thead>
<tr>
<th>Item</th>
<th>Number or acres on this farm</th>
<th>Work units per head or per acre</th>
<th>Total work units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operator(s)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family (paid)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family (unpaid)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hirel men</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Man equivalent (Total ÷ 12)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### WORK UNITS PER MAN

<table>
<thead>
<tr>
<th>Item</th>
<th>Number or acres on this farm</th>
<th>Work units per head or per acre</th>
<th>Total work units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total pounds of milk sold</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total pounds of milk sold</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of cows</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total dozens of eggs sold</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of hens</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total lbs. of feed for laying flock</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Module: Reorganizing A Farm Business

Resource materials for teachers:

Books:
1. Profitable Farm Management
   Hamilton and Bryant Sec. Ed. 1963
2. Profit Maximizing Principles
   OSU 1970 (Cornell IMS)

Booklets:
1. Planning A Profitable Farm Business
   Cornell IMS
2. Agricultural Business Management -- Principles That Effect Production
   Cornell IMS

Movies:
1. Farm Management Film Series
   Cornell Film Library, 3 films 45 min.
2. Agricultural Resources in New York State
   Cornell Film Library, 35 min.

Other resources:
1. Class visit to a farm business.
2. Class visit by a banker.
3. Farm business problems made up by teacher.

Note: The Cornell Farm Business Chart and a Farm Business Problem are included in this module as a part of the unit, however a teacher may set up his own farm business problem.
Title - FARM BUSINESS INSURANCE

DESCRIPTION:

Students studying the Farm Business Insurance module will be involved in the selection and use of various types of insurance considered necessary for the safe financial operation of a farm business.

Liability, property and motor vehicle insurance will be considered by students in relation to the level of risk and size of business for a given farm situation.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Making decisions about insurance</td>
<td>1</td>
</tr>
<tr>
<td>2. Insurance terms, types of insurance coverage and types of insurance companies</td>
<td>3 1/2</td>
</tr>
<tr>
<td>3. Selecting types and amounts of insurance for the entire farm business</td>
<td>3</td>
</tr>
<tr>
<td>4. Selecting an agency</td>
<td>1</td>
</tr>
<tr>
<td>5. How to purchase insurance</td>
<td>1 1/2</td>
</tr>
<tr>
<td>6. Making claims</td>
<td>1 1/2</td>
</tr>
<tr>
<td></td>
<td>18 1/2</td>
</tr>
</tbody>
</table>

Revised June, 1974
MODULE OF INSTRUCTION

Title - FARM BUSINESS INSURANCE

OBJECTIVES to be obtained:

The student will be able to:

1. Using references, correctly describe the chances of loss, causes of loss and the effect of loss that may occur in a farm business.

2. Score 80% on a test pertaining to insurance terms and types of insurance.

3. Name three different kinds of insurance companies and list three advantages and three limitations of each.

4. Make a priority list which, to the satisfaction of the teacher, will indicate the insurance needs of a prearranged business.

5. Select the kinds and amounts of insurance for that prearranged business and calculate the cost of such coverage within a specific sum provided for by the teacher.

6. List six factors to consider in selecting an agency from which to purchase insurance.

7. Demonstrate, in a role play situation, how to purchase and maintain an insurance program for a given farm business.

8. Fill out a claim form for a given situation to the satisfaction of the instructor.
# FARM BUSINESS INSURANCE

## OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Unit 1</th>
<th>Making decisions about insurance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 1:</td>
<td>Using references, correctly describe the chances of loss, causes of loss and the effect of loss that may occur in a farm business.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 2</th>
<th>Insurance terms, types of insurance coverage and types of insurance companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 2:</td>
<td>Score 80% on a test pertaining to insurance terms and types of insurance</td>
</tr>
</tbody>
</table>

## CONTENT

### A. Define term insurance
- B. Chances of losses
- C. Causes of losses
- D. Effects of losses

### A. Terms
- Policy
- Premium
- Priorities
- Endorsement
- Blanket coverage
- Face value
- Indirect losses
- Deductible clauses

### B. Types of insurance
- Property insurance
  - Fire (define)
    - Purpose
    - Calculating cost
    - Deduction
  - Wind (define)
    - As an endorsement
    - Cost
  - Motor Vehicle insurance
    - Personal injury liability (define)
      - Minimum (state law)-maximums and cost differences
        - One person
        - All persons
        - Cost
        - Age of operator
        - Area of residence
        - Class
        - Distance of work
        - Accident experience of principle drivers
    - Property damage
      - Minimum (state law)-maximums and cost differences
        - Cost
    - Medical Payment (define)
      - Range of amounts and cost of each

---

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and class discussion</td>
<td>A. Students join in discussion on decision making about insurance</td>
<td>A. Students write a composition on the assigned reading. Grade and return for notebooks.</td>
</tr>
<tr>
<td>B. Assign reading on term insurance</td>
<td>B. Students review their own insurance programs</td>
<td>B. Participation in discussion.</td>
</tr>
<tr>
<td>A. Show slide film on insurance</td>
<td>C. Students discuss parents or cooperative farmers insurance programs</td>
<td>C. Extra credit for student. Written report on his personal or farms insurance program.</td>
</tr>
<tr>
<td>B. Prepare a handout with definitions of terms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Lecture and students discussion of terms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Invite insurance people in as resource people.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Liability</td>
<td>A. Students observe film and record notes</td>
<td>A. Written test. 80% accuracy</td>
</tr>
<tr>
<td>- car</td>
<td>B. Students keep handout in notebook</td>
<td>. Sample questions</td>
</tr>
<tr>
<td>- property</td>
<td>C. Groups of students prepare reports on the types of insurance listed in content. Each student in the group can report on a specific topic under one type of insurance.</td>
<td>. define 5 of the following terms: policy</td>
</tr>
<tr>
<td>- Fire</td>
<td>D. Students take notes on all reports of resource people invited to class.</td>
<td>premium</td>
</tr>
<tr>
<td>- Life</td>
<td></td>
<td>face value</td>
</tr>
<tr>
<td>- Medical</td>
<td></td>
<td>endorsement</td>
</tr>
<tr>
<td>- Disability</td>
<td></td>
<td>deductible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>clause</td>
</tr>
<tr>
<td></td>
<td></td>
<td>indirect loss</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In the spaces provided place the word which best completes the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the type of insurance which provides protection against financial loss in case your car hits the neighbor's barn is ___</td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Comprehensive (define)</td>
<td>cost</td>
</tr>
<tr>
<td></td>
<td>Uninsured motorist clause (define)</td>
<td>cost</td>
</tr>
<tr>
<td></td>
<td>Fire and Theft (define)</td>
<td>cost</td>
</tr>
<tr>
<td></td>
<td>Collision (define)</td>
<td>need</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>deductible clause</td>
</tr>
<tr>
<td></td>
<td>Public Liability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>farmers public liability-general (define)</td>
<td>coverage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cost</td>
</tr>
<tr>
<td></td>
<td>farmers public liability-comprehensive (define)</td>
<td>coverage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cost</td>
</tr>
<tr>
<td></td>
<td>farm employers liability (define)</td>
<td>coverage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cost</td>
</tr>
<tr>
<td></td>
<td>workmens compensation (define)</td>
<td>coverage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>cost</td>
</tr>
</tbody>
</table>

Objective 3 Name
3 different kinds of insurance companies and list 3 advantages and 3 limitations of each.

A. Stock
B. Mutual
C. Cooperative

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Teacher give definition of each and ask students what they think would be advantages or disadvantages. Make a consensus list.</td>
<td>A. Students take notes, discuss advantages and disadvantages of the insurance companies in the area.</td>
<td>A. Students orally answer questions to review material discussed.</td>
</tr>
<tr>
<td>B. List the various kinds of insurance companies in your area. Identify each company according to the kinds of insurance they specialize in and if they are a stock, mutual or cooperative insurance company.</td>
<td></td>
<td>B. Written test-list companies with advantages, limitations and type of insurance they write.</td>
</tr>
<tr>
<td>OBJECTIVES BY UNIT</td>
<td>CONTENT</td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td><strong>Unit 3 - Selecting types and amounts of insurance for the entire farm business.</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective 4</td>
<td>Make a priority list which, to the satisfaction of the teacher, will indicate the insurance needs of a prearranged business.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. List kinds of insurance needed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Most important</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Important</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Less important</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Decision based on</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Amount invested</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Likelihood of loss</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Cost of coverage</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Etc</td>
<td></td>
</tr>
<tr>
<td>Objective 5</td>
<td>Select the kinds and amounts of insurance for that prearranged business and calculate the cost of such coverage within a specific sum provided for by the teacher.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Property</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Auto and truck (motor vehicle)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Public liability</td>
<td></td>
</tr>
<tr>
<td><strong>Unit 4 - Selecting an agency</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective 6</td>
<td>List six factors to consider in selecting an agency from which to purchase insurance.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Factors to consider when selecting an insurance agency</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Location</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Services offered</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Reliability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Compatibility of purchaser and agent</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Promptness</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Insurance cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Willingness of the agent to re-evaluate coverage regularly</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Teaching Methods</th>
<th>Student Application Activities</th>
<th>Evaluation Procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and class discussion on how to determine priorities.</td>
<td>Participate in discussion - suggest reasons why one type may be more important for a given situation. Students make list of priorities for their own situations and list reasons for the selection.</td>
<td>A. Evaluate individuals' lists and reasoning behind choices.</td>
</tr>
<tr>
<td>B. Use resource people to discuss selecting types and determining amounts of insurance to carry in a farm business.</td>
<td></td>
<td>B. Written test on given situations regarding a sample farm business.</td>
</tr>
</tbody>
</table>

| A. Have a local agent discuss farm insurance with students. | A. Take part in discussion | Performance Test. |
| B. Teacher provides pre-arranged farm business information. | B. Teacher-student discussion of insurance needs for this farm business. Agent and students discuss total insurance needs for farm. | A. Students list priorities for the farm. |
| C. Field trip to farm to gather data for performance test. | C. Do performance test based on data from actual farm business. | B. Recommend types of insurance. |
| | | C. Recommend actual amounts of insurance to apply to each type of insurance selected, and calculate cost of such coverage. |

<p>| A. Lecture and class discussion. | A. Students list factors and the importance of each in notebooks. | A. Grade the student participation in discussion. |
| B. Ask students what they feel are important attributes of an agency they would like to deal with. | | B. Paper and pencil quiz - list 6 factors. |
| C. Make a list of factors. | | C. Give characteristics of two hypothetical agencies and have students select one and tell the factors that led to their decision. |</p>
<table>
<thead>
<tr>
<th>OBJECTIVE &amp; UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 5 - How to purchase assurance</strong>&lt;br&gt;Objective 7&lt;br&gt;Demonstrate in a role play situation how to purchase and maintain an insurance program for a given farm business.</td>
<td>A. Records needed&lt;br&gt;1. Cash account&lt;br&gt;2. Inventory&lt;br&gt;3. Depreciation chart&lt;br&gt;B. Making an appointment&lt;br&gt;1. At convenience of insuree&lt;br&gt;2. At home of insured&lt;br&gt;C. Points to discuss&lt;br&gt;D. Periodic re-evaluation</td>
</tr>
<tr>
<td><strong>Unit 6 - Making Claims</strong>&lt;br&gt;Objective 8&lt;br&gt;Fill out a claim form for a given situation to the satisfaction of the instructor.</td>
<td>A. Contacting the agent or adjustor&lt;br&gt;B. Listing all losses with values&lt;br&gt;C. Understand partial loss vs complete loss&lt;br&gt;D. Guard against being taken in by claims agents-also wise use of claims agents where it might prove beneficial</td>
</tr>
</tbody>
</table>
### TEACHING METHODS

A. Guest agent and teacher role playing
B. Discuss material listed in content
C. Visit a local insurance company office. Have the manager describe his business and service rendered to customer.

### STUDENT APPLICATION ACTIVITIES

A. Role playing
   Students act as agents and insuree. Different students act out each of the areas listed under content.

### EVALUATION PROCEDURES

A. Grade performance of each student who plays the role of insuree.
B. Field trip. Report grade.

<table>
<thead>
<tr>
<th>A.</th>
<th>B.</th>
<th>C.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discuss making claims with the class</td>
<td>Student contacts an agent and gets information about making a claim.</td>
<td>Grade the student summary on his interview with the agent.</td>
</tr>
<tr>
<td>Provide claim forms</td>
<td>Student fills out claim form for a given situation in relation to the business studied in this unit.</td>
<td>Grade the completed claim form for the farm business situation.</td>
</tr>
<tr>
<td>Give hypothetical damage information on the farm studied. Students complete claim forms based on that data.</td>
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</tbody>
</table>

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Title: FARM BUSINESS INSURANCE

RESOURCE MATERIALS

A. Books -
   1. Teacher references
      Farm Management Handbook
   2. Student references
      Doane's Farm Management Guide 9th Edition

B. Bulletins -
   1. Teacher references
      Insurance for the Farm Business, R.S. Smith - Cornell Extension Bulletin #1003
      Insurance facts for farmers - U.S.D.A. Farmers Bulletin #2137
      Insurance in agriculture - Robert E. Norton Instructional Materials Service #G10
   2. Student references

C. Audiovisuals -
   1. Teachers own premium statements for a 2 year period to show reduction of premium with age of car. (transparencies)
   2. Filmstrip - Insurance for the Farm Business Instructional Materials Service #F2.1
   3. Film on insurance, Insurance In the Farm Business, Slide film 380A, Vocational Agriculture Service, University of Illinois, Urbana, Ill. 1973
MODULE OF INSTRUCTION

Title: FARM BUSINESS LAW
Code: 01.010406-04

DESCRIPTION:

The person engaged in any agricultural enterprise is constantly involved in application of the law. From this module the student should gain genuine respect and intelligent appreciation for a segment of the law which affects him at home and at work. The student will develop an understanding of the law, particularly as it effects farming enterprises. He will learn to use the law to avoid legal pitfalls.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Major Division</th>
<th>Time Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Nature of Law; Violations of Laws</td>
<td>9</td>
</tr>
<tr>
<td>2. Contracts and Agreements</td>
<td>3</td>
</tr>
<tr>
<td>3. Transfer of Ownership</td>
<td>2</td>
</tr>
<tr>
<td>4. Partnerships and Corporations</td>
<td>2</td>
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</tbody>
</table>

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<thead>
<tr>
<th></th>
<th>Class</th>
<th>Other</th>
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<tr>
<td></td>
<td>16</td>
<td>3</td>
</tr>
</tbody>
</table>

Revised June 1974
MODULE OF INSTRUCTION

Title - FARM BUSINESS LAW

Objectives to be obtained:
The student will be able to:

1. Define the term law and list the three essentials each law must provide, after lecture and discussion of needs of laws.

2. List from memory the two major sources of laws.

3. With the aid of the instructor, list the three types of courts in the U.S. Court System and list the three duties of these courts.

4. With the aid of his instructor compile a list of at least 8 legal documents (books and pamphlets) which should be available for use in the farm business.

5. With the use of available references, define the four types of violation of law and the three major classification of crimes.

6. Differentiate to the instructor satisfaction between oral and written contracts and express and implied contracts.

7. Complete a prepared contract blank to purchase an agricultural service.

8. List from memory four of the five reasons for legal termination of contracts.

9. List from memory at least three ways of transferring property and five reasons for preparing a will.

10. List, using references, five important characteristics of a partnership.

11. List from memory three advantages and three disadvantages of partnerships.

12. List three advantages and three disadvantages of a corporation, and differentiate between a partnership and a corporation.
### AGRICULTURE

#### FARM BUSINESS LAW

<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit 1 - The Nature of Law; Violations of Laws.</strong></td>
<td>A. Define: Law</td>
</tr>
<tr>
<td>Objective 1 Define the term LAW and list the three essentials each law must provide, after lecture, and discussion of the needs of laws.</td>
<td>B. Essentials of laws</td>
</tr>
<tr>
<td></td>
<td>. Defines rights of people</td>
</tr>
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<td></td>
<td>. Protects people in enjoyment of rights</td>
</tr>
<tr>
<td></td>
<td>. Provides punishments for people jeopardizing those rights</td>
</tr>
<tr>
<td></td>
<td>C. Moral obligations</td>
</tr>
<tr>
<td></td>
<td>D. Legal obligations</td>
</tr>
<tr>
<td>Objective 2 List from memory two major sources of law.</td>
<td>A. Common law</td>
</tr>
<tr>
<td></td>
<td>B. Statutory law</td>
</tr>
<tr>
<td>Objective 3 With the aid of the instructor, list three types of courts in the U.S. Court System, and list the three duties of these courts.</td>
<td>A. U.S. Courts</td>
</tr>
<tr>
<td></td>
<td>B. State law courts</td>
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<td></td>
<td>C. State equity courts</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Take notes on information</td>
<td>A. Written or oral</td>
</tr>
<tr>
<td>B. Supervised</td>
<td>presented.</td>
<td>B. Evaluate student's</td>
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<tr>
<td>study</td>
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<td>ability to</td>
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<td></td>
<td></td>
<td>A. Define law</td>
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<td>B. List the three</td>
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<td>essentials of all laws.</td>
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<tr>
<td>A. Reading and</td>
<td>A. Research - one group, the</td>
<td>A. Observe student</td>
</tr>
<tr>
<td>supervised study</td>
<td>needs for and uses of</td>
<td>progress and</td>
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<tr>
<td></td>
<td>common law. Another group</td>
<td>results of panel</td>
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<td></td>
<td>the needs and uses of</td>
<td>discussion.</td>
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<td></td>
<td>statutory laws. Students can</td>
<td>B. Essay questions on</td>
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<td></td>
<td>discuss actual cases that</td>
<td>common law and</td>
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<td>dealt with common and</td>
<td>statutory law.</td>
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<td>statutory laws in the</td>
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<td>community.</td>
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<td>B. Reflective</td>
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<td>thought, student</td>
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<td>half the class).</td>
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<tr>
<td>A. Reading and</td>
<td>A. Note taking</td>
<td>A. Written or oral</td>
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<td>supervised work</td>
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<td>B. Student will name</td>
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<td>experience.</td>
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<td>and identify to the</td>
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<td>B. Students could report on</td>
<td>instructor's satisfac-</td>
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<td>the local, town and county</td>
<td>tion at least three</td>
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<td>courts in their area. Note</td>
<td>uses of at least two</td>
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<td>the location of the higher</td>
<td>of the three types of</td>
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<td></td>
<td>courts in the state.</td>
<td>courts in the U.S.</td>
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<tr>
<td>B. Class</td>
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<td>discussion</td>
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<td>. Essentials of</td>
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<td>Business Law</td>
<td>Bulletin 988</td>
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<tr>
<td>C. Invite a</td>
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<td>good local</td>
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<td>attorney to</td>
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<td>discuss common</td>
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<td>law, statutory</td>
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<td>law and our</td>
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<td>court systems.</td>
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</tbody>
</table>
**OBJECTIVES BY UNIT** | **CONTENT**
---|---
**Objective 4**  
With the aid of his instructor, compile a list of at least 8 legal books and pamphlets, which should be available for use in the farm business.  
A. Legal books and pamphlets  
   - Buying a farm on contract  
   - Taxmanship in farm management decision making  
   - Legal terms and obligations common to farm business  
   - Incorporating of the farm business  
   - Father and son partnership arrangements  
   - Father and son arrangements on the farm  
   - The farmer and the lawyer  
   - Essentials of business law  
   - Profitable farm management  
   - Others available

**Objective 5**  
With the use of available references, define the four types of violation of law and the three major classifications of crimes.  
A. Violations  
   - Assault and battery  
   - Trespass  
   - Negligence  
   - Deceit  
   - Slander  
   - Libel  
B. Kinds of crimes  
   - Treason  
   - Felonies  
   - Misdemeanors

**Unit 2 - Contracts and Agreements.**  
**Objective 6**  
Differentiate, to the instructor's satisfaction, between oral and written contracts, and express and implied contracts.  
A. Contracts - define  
   - Oral  
   - Written  
     - real estate  
     - non-real estate  
B. Express  
C. Implied
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study. Assign questions from all references.</td>
<td>A. Student lists titles, authors, and publishers of the best available references.</td>
<td>A. Evaluate completion and neatness of supervised study exercise.</td>
</tr>
<tr>
<td>B. Field trip to a local court session audience with judge.</td>
<td>B. Take notes on proceedings concerning information studies.</td>
<td>B. Notebook grade.</td>
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<tr>
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<td>C. List questions which arise.</td>
<td>C. Field trip report.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Supervised study</td>
<td>A. Each student is assigned to prepare at least one particular violation or kind of crime and outline it in detail in a report.</td>
<td>A. Written or oral test.</td>
</tr>
<tr>
<td>B. Class discussion</td>
<td>B. Students will develop a module packet on this module and use it for future reference.</td>
<td>B. List at least five of the six types of violation of law, and define one of the three kinds of crime to the instructor's satisfaction.</td>
</tr>
</tbody>
</table>

| A. Lecture | A. Note-taking. | A. Written—test—on objectives. |
| B. Supervised study — buying a farm on contract. | B. Complete worksheet made up by the instructor. | B. Grade worksheet for accuracy. |
| D. Students will use contracts in FFA projects such as crop demonstrations, calf chains and pig chains. | | |

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### OBJECTIVES BY UNIT

<table>
<thead>
<tr>
<th>Objective 7</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete a prepared contract blank to purchase an agricultural service.</td>
<td>A. Reading of the contract</td>
</tr>
<tr>
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<td>B. Formality and simplicity of terms</td>
</tr>
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<td>C. Competency</td>
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<td>. Legal age in state</td>
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<td>D. Liability</td>
</tr>
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<td>E. Signatures and seals</td>
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</table>

<table>
<thead>
<tr>
<th>Objective 8</th>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td>List from memory 4 or 5 reasons for legal termination of contracts.</td>
<td>A. Legal termination of a contract</td>
</tr>
<tr>
<td></td>
<td>. Fraud</td>
</tr>
<tr>
<td></td>
<td>. Misrepresentation</td>
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<td></td>
<td>. Puffing</td>
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<td></td>
<td>. Duress</td>
</tr>
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<td>. Undue influence</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit 3 - Transfer of Ownership.</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Objective 9</td>
<td>A. Transferring property</td>
</tr>
<tr>
<td></td>
<td>. Purchase</td>
</tr>
<tr>
<td></td>
<td>. Gift</td>
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<td>. Will</td>
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<td>. Occupancy</td>
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<td>. Finding</td>
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<td>B. Preparing a Will</td>
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<td>. Legal</td>
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<td></td>
<td>. Time</td>
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<td></td>
<td>. Cost of representation</td>
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<td>. Loss of evaluation to state</td>
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<td></td>
<td>. Stress</td>
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<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
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<td>------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Objective 7</td>
<td></td>
</tr>
<tr>
<td>A. Lecture</td>
<td>A. Note taking.</td>
</tr>
<tr>
<td>B. Supervised study.</td>
<td>B. Completion of contract for any agricultural service, sanctioned by the instructor.</td>
</tr>
<tr>
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</tr>
<tr>
<td>A. Lecture</td>
<td></td>
</tr>
<tr>
<td>B. Supervised study.</td>
<td>A. Note taking.</td>
</tr>
<tr>
<td></td>
<td>B. Students will be arranged into five groups. Each group will research and prepare a discussion for one of the legalities terminating a contract.</td>
</tr>
<tr>
<td></td>
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</tr>
<tr>
<td>A. Supervised study.</td>
<td>A. Read, take notes.</td>
</tr>
<tr>
<td>B. Lecture</td>
<td>B. Open discussion on transfer of property.</td>
</tr>
<tr>
<td>C. Class discussion.</td>
<td>C. Students will use this information on Work Experience Records for class requirements and FFA award programs.</td>
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<td></td>
<td>B. Name three ways of transferring property and five reasons for preparing a Will.</td>
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<tr>
<td>UNIT</td>
<td>OBJECTIVES BY UNIT</td>
</tr>
<tr>
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<tr>
<td>4</td>
<td><strong>Objective 10</strong> List, using references, five important characteristics of a partnership.</td>
</tr>
<tr>
<td>4</td>
<td><strong>Objective 11</strong> List, from memory, three advantages and three disadvantages of partnerships.</td>
</tr>
<tr>
<td>4</td>
<td><strong>Objective 12</strong> List, from memory, three advantages and three disadvantages of a corporation and differentiate between a partnership and a corporation.</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>------------------</td>
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</tr>
<tr>
<td>B. Field trip to a farm organized as a partnership.</td>
<td>B. Questions to the partners.</td>
</tr>
<tr>
<td>C. Use adult farmer partnerships as example.</td>
<td>C. Assist students to develop partnerships with their parents or with cooperative farmers.</td>
</tr>
<tr>
<td>A. Lecture.</td>
<td>A. Note taking.</td>
</tr>
<tr>
<td>B. Class discussion.</td>
<td>B. Students will complete jobs as assigned by the instructor.</td>
</tr>
<tr>
<td>C. Assigned questions from reference materials.</td>
<td>C. Notebooks will be kept for module completion and course requirements.</td>
</tr>
<tr>
<td>D. Invite a resource person involved in a partnership to discuss the partnership with students.</td>
<td></td>
</tr>
<tr>
<td>A. Supervised study.</td>
<td>A. Students use references to discover advantages and disadvantages of corporations.</td>
</tr>
<tr>
<td>B. Class oriented discussion.</td>
<td>B. Class discussion.</td>
</tr>
<tr>
<td>C. Field trip to agricultural corporation and partnership.</td>
<td>C. Written report of comparison of corporations and partnerships.</td>
</tr>
</tbody>
</table>

Field trip to agricultural corporation and partnership.
Module of Instruction

Title: FARM BUSINESS LAW

Resource Materials

Books

Bulletins
College of Agriculture - Cornell University
988-Legal terms and obligations common to the farm business
1016-Incorporation of the farm business
861-Father and son partnership arrangements
892-Father and son arrangements on the farm
1202-The farmer and the lawyer
A.E. 568-Buying a farm on contract

Periodicals

Audiovisuals

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MODULE OF INSTRUCTION

Title - FARM ORGANIZATIONS

DESCRIPTION:

Our American system functions on the rulings of majority rule, which involves the interaction of large groups. In turn, these groups result in strong organizations. Agriculture is an industry which relies heavily upon its organizations to teach and promote its business. Due to the nature of Production Agriculture, farmers have always been strongly individualistic. As a group they have found it economically necessary to turn to organizations which meet their specific needs.

These organizations may be local, state or national, as well as civic or agricultural.

Students taking this module will be involved with organizations which can accommodate their needs as farmers. Emphasis will be placed on local organizations. The work involved will deal primarily with meeting the leaders of these organizations and discussing their functions.

MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocations</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Organizations available to farmers</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>2. Specific uses of organizations to farmers</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>3. Using organizations to support the farmers' needs</td>
<td>1</td>
<td>3</td>
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<td>4</td>
<td>26</td>
</tr>
</tbody>
</table>

Revised June 1974
OBJECTIVES to be obtained:

The student will be able to:

1. Compile a list of no fewer than 30 organizations available to farmers.

2. List from memory five cooperatives, five agriculture organizations, and ten other organizations available to farmers.

3. Categorize organizations into farmer cooperatives, civic organizations, youth organizations, other agricultural organizations, and list the major purpose of each.

4. Select three organizations that farmers should join. List three reasons why being a member of each organization would help the farmer.

5. Determine organization requirements for one farm organization. List the advantages that members have as a result of being active members.
# Farm Organizations

## Objectives by Unit

<table>
<thead>
<tr>
<th>Unit 1</th>
<th>Organizations available to farmers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Objective 1</strong></td>
<td>Compile a list of no fewer than 30 organizations available to farmers.</td>
</tr>
</tbody>
</table>

### A. Cooperatives
- Agway
- Eastern Breeder's Inc.
- Dairymen's League
- Production Credit
- Dairy Herd Improvement Coop.
- Other Local Groups
- Council of Farmer Cooperatives

### B. Farm Organizations
- Farm Bureau, County-State-National
- Cooperative Extension
- Grange
- Young Farmers and Ranchers
- National Farmers Organization
- Farm Workers Organization
- Breed Associations
- National Cattleman's Association
- State Forestry Association
- Local Fair Associations
- State Exposition Committee
- Farmers Home Administration
- Soil Conservation Service
- Agriculture Stabilization & Conservation Committee
- Rural Electricification Association
- New York Agriculture and Conservation Council
- Fruit Commissions

### C. Other Civic Organizations
- FFA
- 4-H
- Grange

### D. Youth Organizations

## Objective 2
List from memory five cooperatives, five agriculture organizations, and ten other organizations available to farmers.

### A. List five cooperatives associated with the agricultural industry in your area.
### B. List five agricultural organizations providing services to farmers in your area.
### C. Name ten other types of organizations in your community that are available to farmers.
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Short lecture on introduction.</td>
<td>A. Note taking - lecture and guest speakers.</td>
<td>A. Notebook grade.</td>
</tr>
<tr>
<td>B. Supervised study.</td>
<td>B. Discussion.</td>
<td>B. Written test on farm organizations, cooperatives, civic</td>
</tr>
<tr>
<td>C. Class discussion.</td>
<td>C. Compile list of organizations available for farmers.</td>
<td>groups and youth organizations.</td>
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<tr>
<td>D. Guest speakers from as many of the</td>
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<tr>
<td>different organizations as possible.</td>
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<tr>
<td>A. Chalk and Board</td>
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<tr>
<td>B. Lecture</td>
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<td></td>
</tr>
<tr>
<td>C. Invite resource people from the</td>
<td></td>
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<tr>
<td>various organizations to speak to class</td>
<td></td>
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<tr>
<td>members.</td>
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<tr>
<td>D. Filmstrips on cooperatives.</td>
<td></td>
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<tr>
<td>E. Movies on agricultural organizations.</td>
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</tr>
<tr>
<td>A. Students could attend organizations'</td>
<td></td>
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<tr>
<td>annual meetings held locally.</td>
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<tr>
<td>B. Attend governmental seminar for</td>
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<tr>
<td>agricultural youth sponsored by New</td>
<td></td>
<td></td>
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<tr>
<td>York Farm Bureau and State Education</td>
<td></td>
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</tr>
<tr>
<td>Department.</td>
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</tbody>
</table>

3.5
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 3  
Catagorize organizations into farmer cooperatives, civic organizations, youth organizations, other agricultural organizations, and list the major purpose of each. | A. Cooperatives  
- List each and state functions  
B. Civic Organizations  
- List each and state functions  
C. Other Agricultural  
- List each and state functions  
D. Youth Organizations  
- List each and state functions |
| Unit 3 - Using organizations to support the farmers' needs.  
Objective 4  
Select three organizations that farmers should join. List three reasons why being a member of each organization would help the farmer. | A. Personal preference of organization selection with regard to meeting the needs of a particular situation. |
| Objective 5  
Determine organizational requirements for one farm organization. List the advantages that members have as a result of being active members. | A. Organization Requirements  
- Type of membership  
- Dues  
- Meeting dates, place and time  
- Other requirements  
B. Advantages of Membership  
- Marketing  
- Purchasing inputs  
- Insurance  
- Legislation  
- Credit source  
- Information |
### Teaching Methods

| A. Supervised study. |
| B. Field trip to at least one cooperative. |
| C. Guest speaker on how agricultural agencies and organizations serve the farmer. |
| D. Field trip to at least one other agricultural organization. |

### Student Application Activities

| A. Students can compile an organized list of agricultural cooperatives, agricultural organizations, civic organizations and youth groups. |

### Evaluation Procedures

| A. Teacher evaluation of list. |
| B. Oral quiz on the types of organizations, major purposes and functions. |

---

| A. Supervised study. |
| B. Student's role playing, develop small discussion groups. |

| A. The student can select and justify three organizations for a given situation. |

| A. Teacher evaluation of student's role playing, discussion groups. |
| B. Written examination, questions on specific situations. Students select organizations and support their choices with reasons. |

---

| A. Class discussion of organization membership requirements. |
| B. Supervised study. |
| C. Resource guest speakers that are members of organizations. |

| A. Student takes notes on discussion, supervised study and guest speakers. |
| B. Select an organization that you feel would be beneficial. Explain the reasons for your selection. |

| A. Teacher evaluation of notebook. |
| B. Evaluation of student's selection of an organization. |
Title - FARM ORGANIZATIONS

Code - 01.010407-01

RESOURCE MATERIALS

Books: Credit to Farmers, The Story of Federal Intermediate Credit Banks and Production Credit Associations, W.N. Stokes, Jr. Published by the Federal Intermediate Credit Banks, c/o Farm Credit Administration, Washington, D.C. 20578.

Bulletins: How Agricultural Agencies and Organizations Serve the Farmer, S.U.N.Y - State Education Department, Agricultural Education Department.

The dynamic field of agriculture is stimulated and supplemented by our government through educational assistance, specific services, and financial reimbursement. Many government supported programs promote a desire to enrich or conserve the soil, rebuild properties and protect the American consumer from possible encumbrances of which he is not aware.

The student will be involved with identifying programs that are available, and determining how to take advantage of the facilities and services available through government programs. He will be concerned with evaluating programs and making decisions regarding the programs of concern to him.

**MAJOR DIVISIONS OR UNITS OF CONTENT**

| Time Allocation |
|-----------------|-----------------|-----------------|
| Class           | Other           |
|-----------------|-----------------|-----------------|
| 1. Government programs available to farmers | 5 | 5 |
| 2. Providing services to farmers | 1 | 3 |
| 3. Programs providing financial reimbursement to farmers | 1 | 3 |
| 4. The American consumer and the farmer | 5 | 3 |
| 5. Using programs to support the needs of farmers | 2 | 2 |

Revised 6/74
MODULE OF INSTRUCTION

Title - GOVERNMENT PROGRAMS FOR FARMERS

OBJECTIVES to be obtained:

The student will be able to:

1. List at least 10 different Government programs available to farmers.

2. Contact through written or personal communications, two agencies for the procurement of materials explaining the program provided, and forms to be used in requesting services or reimbursement of the agency.

3. Select five of the ten programs from objective No. 1, which are being used by local farmers.

4. Select from the list in objective No. 1 the programs providing services for farmers and explain how they influence agriculture.

5. Select three programs providing services to farmers, prepare an oral class report, discuss the effectiveness of each program.

6. Select from the list in objective No. 1, the programs providing financial reimbursement to farmers and how these programs can help farmers become established in farming and continue in farming.

7. Choose and write constructive criticisms to both support, and reject each of two government programs providing financial reimbursement and services to farmers.

8. Prepare a list of eight programs established to protect the American consumer, discuss the merits of each program.

9. Complete the forms requesting services or financial reimbursement of any three of the agencies contacted in objective No. 2.
### Objectives by Unit

**Unit 1: Government Program Available to Farmers**

**Objective 1**
List at least 10 different Government programs available to farmers.

**A. Programs**
- Soil Conservation Service
- Federal Land Bank
- Production Credit
- Federal Housing Administration
- Environmental Protection Agency
- Small Business Administration
- United States Department of Commerce
- United States Department of Interior
- New York State Planning Commission
- State-Federal-County Planning Agencies
- United States Department of Agriculture
- Others

**Objective 2**
Contact through written or personal communications, two agencies for the procurement of materials explaining the program provided, and forms to be used in requesting services or reimbursement of the agency.

**A. Letter Writing**
- Use correct form
- Request information desired
- Write neatly and accurately

**B. Interviewing**
- Introduction - state your purpose for the interview
- Ask valid questions
- Be Precise
- Time - arrange for appointment for interview
- Record information

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture</td>
<td>A. Students keep a module packet on this module.</td>
<td>A. Students will list 10 government programs available to farmers.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td>B. Prepare several questions written - to be asked each speaker regarding the major area being discussed.</td>
<td>B. Teacher evaluates the list.</td>
</tr>
<tr>
<td>C. Guest speakers</td>
<td>- as many different organizations as can possibly be arranged - no fewer than 5.</td>
<td>C. Extra credit for Youthpower Reports.</td>
</tr>
<tr>
<td></td>
<td>FFA Leadership Activity. Students could prepare a youth power paper on careers in Government Services. Youthpower's sponsored by the Farm Bureau on the local, state and national levels.</td>
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</tr>
<tr>
<td></td>
<td>A. Guest speakers prepare several questions as many different organizations as can possibly be arranged - no fewer than 5.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Students keep a module packet on this module.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Supervised study on this module.</td>
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<tr>
<td></td>
<td>B. Supervised practice in interviewing. Teacher student role playing.</td>
<td>B. Teacher evaluation of interview outline.</td>
</tr>
<tr>
<td></td>
<td>C. Guest speakers prepare several questions as many different organizations as can possibly be arranged - no fewer than 5.</td>
<td>C. Grade on oral interview role playing.</td>
</tr>
<tr>
<td></td>
<td>A. Lecture &amp; Supervised practice in letter writing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B. Supervised practice in interviewing. Teacher student role playing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Supervised practice in interviewing. Teacher student role playing.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A. Take notes from lecture on business letters.</td>
<td></td>
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<tr>
<td></td>
<td>B. Write a letter asking for information from one agency.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. Prepare an interview (written) outline.</td>
<td></td>
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<tr>
<td></td>
<td>D. Role playing in class Employer-Agency and student interviews. Teacher could play the role of the government agency. All students could be exposed to this technique before actually arranging for their interview.</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 3        | A. Programs now being used locally -  
|                    | SCS    |
|                    | ASC    |
|                    | And content used in objective No. 1 |
| Objective 4        | A. Farm Service Programs -  
|                    | Soil & Water Management |
|                    | Banking |
| Objective 5        | A. Personal choice under teacher guidance. |

Unit 2 - Providing Services to farmers

Objective 4
Select from the list in Objective #1 the programs providing services for farmers and explain how they influence agriculture.

Objective 5
Select three programs providing services to farmers, prepare an oral class report, discuss the effectiveness of each program.
## GOVERNMENT PROGRAMS FOR FARMERS

### Teaching Methods

| A. Lecture |
| B. Discussion |
| C. Field trips to at least two farms which are carrying out programs sponsored by government agencies. |
| D. Invite Resource personnel to the classroom. |

### Student Application Activities

| A. Note taking |
| B. Discuss existing programs familiar to the class. |
| C. Prepare a list of programs now being used. |

### Evaluation Procedures

| A. Written Test |
| B. Notebook Grade |

---

| A. Supervised study through use of available references and notes from speakers. |
| B. Student Report on agencies contacted. |

### A. Revision of existing list with explanation of types of service available to farmers. Students could research the career requirements for specific areas of employment in service agencies. |

### A. Teacher evaluation report. |
| B. Student evaluation of his report after all reports are given. |

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7
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit 3** - Programs providing financial reimbursement to farmers  
Objective 6  
Select from the list in objective #1 the programs providing financial reimbursement to farmers and how these programs can help farmers become established in farming and continue in farming. | Programs providing financial reimbursement to farmers  
- Federal Land Bank  
- Production Credit  
- FHA  
- Small Business Bureau  
- Others |

**Objective 7**  
Choose and write constructive criticisms to both support, and reject each of two government programs providing financial reimbursement and services to farmers. | A. Selection of programs -  
- Financial Reimbursement  
- Services |

**Unit 4** - The American Consumer and the Farmer  
Objective 8  
Prepare a list of eight programs established to protect the American consumer, discuss the merits of each program. | A. List of programs affecting consumer and farmer.  
- Pure food and Drug Regulations  
- USDA Meat Inspections  
- Milk Inspections  
- Weights and Measures Bureau of Agriculture and Markets  
- Others |

**Unit 5** - Using programs to support the needs of farmers  
Objective 9  
Complete the forms requesting services or financial reimbursement of any three of the agencies contacted in objective No. 2. | A. Completion of applications -  
- Neatness  
- Accuracy  
- Completeness |
# Teaching Methods

| A. Supervised study through use of available references and notes from speakers. |
| B. Teacher can invite young and adult farmers to talk to students regarding how they used some of the government programs. |

| A. Supervised study |
| B. Prepare a panel discussion Divide the class into 4 groups. Let each group present their findings and recommendations. |

| A. Lecture |
| B. Guest Speaker |
| C. Invite local or state agency people in consumer protection. Department of Agriculture & Markets. |

| A. Supervised study |
| B. Students review forms. With data provided by the instructor, complete sample forms. |

| A. Teacher evaluation of list of available references and notes from speakers. |
| B. Students write a report on how service available to farmers. |

| A. Prepare panel discussion on two topics- |
| B. Use the FFA Youth Leadership Farm Forum Format for student involvement and presentations. |

| A. Lecture |
| B. Guest Speaker |
| C. Invite local or state agency people in consumer protection. Department of Agriculture & Markets. |

| A. Note taking |
| B. List programs provided for the American consumer; select several to evaluate. |
| C. Work in groups of two people. Prepare written and oral reports on several programs. |

| A. Practice filling out forms which were received from the agencies contacted. |
| B. Review actual forms that have been completed. Progressive Young Adult Farmers are pleased to allow teachers and students to use this information. |

| A. Teacher evaluation of written criticisms and recommendations. |
| B. Grade on Farm Forum type presentations. |

| A. Teacher evaluation of completed applications. |
| A. Written Report |
| A. Oral Report |
| A. Answering questions |
RESOURCE MATERIALS

Bulletins - Any available from Department of Agriculture and Markets, State Campus, Albany, New York. A Story of Milk, Milk Market Administration, 205 East 42nd Street, New York, New York 10017

Periodicals -

Doones Agriculture Reports
United States Department of Agriculture Reports
FHA Reports
Soil Conservation Service

Audiovisuals -

Film Strip - Evolution in Marketing Farm Products - California State Poly College - I.M.S.
"Careers In Government Services" - I.M.S.

Teachers should have their names put on the periodical list of mailing of the above governmental agencies.
There are many service agencies that provide information and assistance to farmers. These agencies can be listed in the categories of production, construction, financing, marketing and management. Agencies rendering such services include Extension Service, Production Credit Association, Soil Conservation Service, State College of Agriculture at Cornell and many others. Farmers must be able to use these agencies to be successful in their business.

### MAJOR DIVISIONS OR UNITS OF CONTENT

<table>
<thead>
<tr>
<th>Time Allocations</th>
<th>Class</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Services Available to the Farmer</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>2. Agencies Providing Services to Farmers</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3. Using Agencies to Solve Farm Problems</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>22</td>
</tr>
</tbody>
</table>
Title - Using Service Agencies

OBJECTIVES to be obtained:

The student will be able to:

1. Correctly list five categories of agencies providing services to farmers.

2. Correctly identify and list major services supplied by at least three local agencies within each category.

3. Select, to the satisfaction of the instructor, proper agencies to use when faced with a local situation requiring the use of agricultural agencies.

4. Demonstrate his ability to use an agency in at least two of the categories, by involving two agencies to assist the student in solving a problem, which has been approved by the instructor.

5. Develop a directory of local farm service agencies, which meets the instructors specifications.
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| **Unit I - Services Available to the Farmer** | **A. Educational Services**  
  - Cooperative extension  
  - Adult farmer classes |
| **Objective 1** | **B. Financing Services**  
  - Federal land bank  
  - Production credit  
  - Local banks  
  - Others |
| Correctly list five categories of agencies providing services to farmers. | **C. Soil Conservation Services** |
| | **D. Production Services**  
  - Cooperatives  
  - Company field representatives  
  - Veterinarians |
| | **E. Marketing Services**  
  - Cooperatives  
  - milk marketing  
  - livestock  
  - farm supplies |
| | **F. Farm Building Structures & Material Handling**  
  - Cooperatives  
  - Private companies |
| | **G. Farm Equipment & Machinery Dealers** |

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<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture and Discussion</td>
<td>A. Student notes on Lecture, Class Discussion, Field Trips and Guest Speakers</td>
<td>A. Written test on service agencies available in the area.</td>
</tr>
<tr>
<td>B. Supervised Study</td>
<td>B. Collect information describing services supplied by local agencies compile materials in notebook form.</td>
<td>B. Notebook Grade</td>
</tr>
<tr>
<td>C. Field trips</td>
<td>C. Develop a list of all farm service agencies in the community.</td>
<td></td>
</tr>
<tr>
<td>D. Guest Speakers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### OBJECTIVES BY UNIT

**Unit 2 - Agencies Providing Services to Farmers**

**Objective 2**
Correctly identify and list major services supplied by at least three local agencies within each category.

<table>
<thead>
<tr>
<th>CONTENT</th>
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</thead>
<tbody>
<tr>
<td><strong>A. Production Services</strong></td>
</tr>
<tr>
<td>Primary service agencies</td>
</tr>
<tr>
<td>- Agriculture Conservation Program</td>
</tr>
<tr>
<td>- College of Agriculture - Cornell</td>
</tr>
<tr>
<td>- College of Agriculture - Penn. State</td>
</tr>
<tr>
<td>- Dairy Herd Improvement Cooperative</td>
</tr>
<tr>
<td>- Extension Service</td>
</tr>
<tr>
<td>- Soil Conservation Service</td>
</tr>
<tr>
<td>- State Department of Agriculture &amp; Markets</td>
</tr>
<tr>
<td>- Vocational Agriculture Department</td>
</tr>
<tr>
<td>- other</td>
</tr>
<tr>
<td>Secondary service agencies</td>
</tr>
<tr>
<td>- Artificial Insemination</td>
</tr>
<tr>
<td>- Equipment Supplies Co.</td>
</tr>
<tr>
<td>- feed &amp; seed</td>
</tr>
<tr>
<td>- fertilizer</td>
</tr>
<tr>
<td>- machinery dealership</td>
</tr>
<tr>
<td>- veterinarians</td>
</tr>
<tr>
<td>- other</td>
</tr>
</tbody>
</table>

| **B. Construction Services** |
| Primary service agencies |
| - Agriculture Conservation Program |
| - College of Agriculture at Cornell |
| - An-Engineering Department |
| - Extension Service |
| - N.Y.S. Electric & Gas Corp. |
| - Soil Conservation Service |
| - Vocational Agriculture Department |
| - other |

<p>| <strong>C. Marketing Services</strong> |
| Secondary service agencies |
| - farm marketing cooperatives |
| - local markets |
| - other |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Lecture - discussion</td>
<td>A. Students will develop a list of agencies of use to local farmers and list the services provided by each. This can be done by:</td>
<td></td>
</tr>
</tbody>
</table>
| B. Small group information gathering sessions | . Using references  
. Discussion of services used  
. Small group information gathering sessions  
. Securing information during field trip(s)  
. Gathering information from guest speaker(s) | B. Evaluate lists developed by students. |
<p>| C. Field trips          |                                                                                               |                                            |
| D. Guest speakers       |                                                                                               |                                            |</p>
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 3 - Using Agencies to Solve Farm Problems</td>
<td>A. Determine which agencies can best meet your needs</td>
</tr>
<tr>
<td>Objective 3</td>
<td>• Availability in area</td>
</tr>
<tr>
<td>Select to the satisfaction of the instructor, proper</td>
<td>• Service agencies in the area</td>
</tr>
<tr>
<td>agencies to use when faced with a local situation</td>
<td>• Ability to work together</td>
</tr>
<tr>
<td>requiring the use of Agricultural agencies.</td>
<td>• Cost</td>
</tr>
<tr>
<td></td>
<td>• Time</td>
</tr>
<tr>
<td></td>
<td>• Other</td>
</tr>
<tr>
<td>TEACHING METHODS</td>
<td>STUDENT APPLICATION ACTIVITIES</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------------------------------------</td>
</tr>
<tr>
<td>A. Lecture - discussion</td>
<td>Students will solve a given problem, requiring them to select agencies to use in solving the problem.</td>
</tr>
<tr>
<td>B. Individual work with students</td>
<td>Students present an actual (preferable) or hypothetical problem to the teacher for approval. The problem must require the services of two agencies to solve it.</td>
</tr>
<tr>
<td>C. Problem solving method</td>
<td>Students will contact the agencies and solve the problem. (Care should be taken that not too many students contact the same agency.)</td>
</tr>
</tbody>
</table>
| D. Field trips and guest speakers | Students will develop a directory of agencies that can be used by local farmers. The directory should include at least:  
- Name of agency  
- Name of person to contact  
- Telephone No., or how to reach  
- Address  
- Services provided (in outline form) | . Completeness  
. Neatness  
. Is it in a usable form?                                                                                                                                                           |
<table>
<thead>
<tr>
<th>OBJECTIVES BY UNIT</th>
<th>CONTENT</th>
</tr>
</thead>
</table>
| Objective 4        | A. Involving the agency  
|                    | - How to contact - telephone, letter, visit, forms to use  
|                    | - What information should be provided to agencies?  
|                    | - Determine how promptly the agency will act on the problem  
|                    | - Responsibilities incurred by accepting service  
|                    | - Expressing appreciation for services received |
| Objective 5        | A. Educational  
|                    | B. Financial  
|                    | C. Soil Conservation  
|                    | D. Production  
|                    | E. Marketing  
|                    | F. Farm Building Structures & Materials Handling  
<p>|                    | G. Farm Machinery and Equipment |</p>
<table>
<thead>
<tr>
<th>TEACHING METHODS</th>
<th>STUDENT APPLICATION ACTIVITIES</th>
<th>EVALUATION PROCEDURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Teacher lead class discussion</td>
<td>A. Notes on lecture, class discussion, films, and guest speakers.</td>
<td>A. Given a specific situation that involves two Agricultural agencies, have the student select the agencies and reasons for his selections.</td>
</tr>
<tr>
<td>B. Supervised study</td>
<td></td>
<td>B. Notebook grade</td>
</tr>
<tr>
<td>C. Films on Service Agencies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Guest speakers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Class discussion</td>
<td>A. Compile a list of service agencies for notebook and future reference.</td>
<td>A. Notebook grade</td>
</tr>
<tr>
<td>B. Student reports</td>
<td></td>
<td>B. Written examination on local service agencies.</td>
</tr>
</tbody>
</table>
TITLE - Using Service Agencies

RESOURCE MATERIALS

Bulletins

Teacher References

1. Soil Conservation Service - P.A. - No. 818 - USDA, SCS
2. What is a Farm Conservation Plan - P.S. - No. 629 - USDA, SCS
3. Assistance Available from the Soil Conservation Service - No. 345 - USDA - SCS
4. Cornell List of Extension Bulletins
   - Agriculture
   - Research
   - Economics
   - Engineering

Note: Most references will be obtained free at the local level. Cooperative Extension, for example, is responsible for promotion at the county level.

Student References

All those listed above as Teacher References

Note: Many references will be obtained locally from Service Agencies