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4-H 192 Leader Guide 4-H Veterinary Science Units I, II, and III

Duane Rice

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Leader Guide

4-H VETERINARY SCIENCE
UNIT S I, II, AND III

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# 4-H VETERINARY SCIENCE

## Table of Contents

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction</td>
<td>3</td>
</tr>
<tr>
<td>The World of Veterinary Medicine</td>
<td>3</td>
</tr>
<tr>
<td>Planning Ahead</td>
<td>4</td>
</tr>
<tr>
<td><strong>Unit I</strong></td>
<td></td>
</tr>
<tr>
<td>Project Overview - The Normal Animal</td>
<td>6</td>
</tr>
<tr>
<td>Reports and Resources</td>
<td>6</td>
</tr>
<tr>
<td>Lesson 1 - Attitude and Behavior</td>
<td>7</td>
</tr>
<tr>
<td>Animal Record Sheet</td>
<td>8</td>
</tr>
<tr>
<td>Lesson 2 - Skin, Membranes and Intestinal Discharges</td>
<td>9</td>
</tr>
<tr>
<td>Lesson 3 - Body Temperature, Pulse and Respiration Rate</td>
<td>10</td>
</tr>
<tr>
<td>Lesson 4 - Maintaining Animal Health</td>
<td>11</td>
</tr>
<tr>
<td>Lesson 5 - Cleaning and Disinfection</td>
<td>12</td>
</tr>
<tr>
<td>Lesson 6 - The Cells of the Animal Body</td>
<td>13</td>
</tr>
<tr>
<td>Lesson 7 - The Tissues of the Animal Body</td>
<td>14</td>
</tr>
<tr>
<td>Lesson 8 - The Organs and Systems of the Animal Body</td>
<td>15</td>
</tr>
<tr>
<td><strong>Unit II</strong></td>
<td></td>
</tr>
<tr>
<td>Project Overview - Animal Disease</td>
<td>16</td>
</tr>
<tr>
<td>Lesson 1 - Introduction to Disease</td>
<td>18</td>
</tr>
<tr>
<td>Lesson 2 - Bacteria and Disease</td>
<td>19</td>
</tr>
<tr>
<td>Lesson 3 - Viruses and Disease</td>
<td>20</td>
</tr>
<tr>
<td>Lesson 4 - External Parasites</td>
<td>21</td>
</tr>
<tr>
<td>Lesson 5 - Internal Parasites</td>
<td>22</td>
</tr>
<tr>
<td>Lesson 6 - Nutrition and Disease</td>
<td>23</td>
</tr>
<tr>
<td>Lesson 7 - Poisons and Disease</td>
<td>23</td>
</tr>
<tr>
<td>Lesson 8 - Stress and Disease</td>
<td>24</td>
</tr>
<tr>
<td>Lesson 9 - Heredity and Disease</td>
<td>25</td>
</tr>
<tr>
<td><strong>Unit III</strong></td>
<td></td>
</tr>
<tr>
<td>Animal Health and Its Relationship to Our World</td>
<td>25</td>
</tr>
<tr>
<td>Animal Health Self-Study Project Leader Guideline</td>
<td>25</td>
</tr>
</tbody>
</table>


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INTRODUCTION

4-H Veterinary Science Leader Guide

As a 4-H leader working with a veterinary science program, you can look forward to an enjoyable and worthy experience while teaching about animals. Four-H is a learning experience for young people and for adults. Your ideas, coupled with assistance from local experts in this field can make this project outstanding. The rewards from an effective program for the 4-H’ers are obvious, the rewards for the leader, though subtle, are evident in community value, self-esteem and personal fulfillment.

This leader guide is designed to help you in idea and project development in the broad scope of veterinary medicine. This project complements other 4-H activities whether they are horse, dairy, pet or sheep projects. The participant will have the opportunity to:

- recognize the difference between a normal and abnormal animal
- learn the terminology of veterinary science
- gain an appreciation for the importance of good management and sanitation
- learn about animal disease causes, development, prevention and protective mechanisms
- understand and appreciate veterinary medicine and its possibilities for a career
- gain leadership experience from group interaction

While veterinary science focuses on animals, young people will gain insights about the function, health and growth of their own bodies because there are similarities between humans and animals.

Innovation and flexibility by the leader can make veterinary science challenging and exciting to all ages. Youth with distinct aptitude toward veterinary medicine should be encouraged to pursue this field.

Animal ownership is not necessary to participate in this project, but it is encouraged, because frequent animal observation is required. Any type of animal is suitable if facilities to manage it are adequate. Pet mice, birds, dogs, cats, goats, horses or cows are examples.

Consultation with a veterinarian can be a valuable resource for material to prepare your program along with printed material in each lesson. Slide-tape sets are also available that correspond with each lesson.

The World of Veterinary Medicine

Veterinarians may work in:

Private practice - Many veterinary students plan to establish a private practice in which they treat and prevent disease in livestock and pets. Approximately one-half of the nation’s veterinarians are general practitioners that treat both large and small animals.

State, public health and government service - Veterinarians supervise federal meat inspection, poultry inspection, quarantine, control and eradication of animal diseases and research disease of animals. They carry out animal disease eradication programs and are concerned with the inspection of animals entering this country from foreign countries.

Armed services - The role of veterinarians in the armed services has been tremendously expanded. Experimental animals in space exploration need expert care and evaluation. Veterinarians also have a responsibility in the area of food hygiene for all military personnel.

Teaching, research and extension - Many veterinarians are engaged in teaching, extension and research. More than 100 projects include microbiology, parasitology, radiology, pathology, biochemistry, anatomy, physiology, pharmacology, as well as many other areas.

Commercial work - Veterinarians are employed by commercial firms to serve on research teams, supervise the health of animal colonies, and aid in the promotion, sales and preparation of products for use in human and veterinary medicine.

Stock farm management - A number of veterinarians are serving as consultants on stock farms and large feedlots.

Zoos - Full-time veterinarians are employed to look after the health and sanitary conditions of zoo animals.

Poultry Industry - The national poultry industry needs the services of the veterinary profession in research, diagnosis and the control and prevention of diseases.

VETERINARY SCIENCE EMPHASIZES LIFE SKILLS

The overall 4-H curriculum places a high priority on helping youth strengthen life skills:

- To develop an inquiring mind
- To respond and relate to other people
- To communicate
- To learn problem-solving methods
- To make creative personal decisions
- To learn the importance of being compatible with other people.

Four-H Veterinary Science can be useful to young people in developing all of the life skills listed above. The veterinary science leader must recognize there is
more being taught than information about animal systems, animal disease and the requirements for good animal health. The communication skills acquired through group discussion, giving a study report, or presenting a demonstration are a part of the expected benefit of the 4-H veterinary science project. Youth and parents will learn to solve animal health problems by being aware of how various disease processes develop.

**PLANNING AHEAD**

As you move forward with these topics, you will find a general pattern and arrangement in Units I and II.

Each section begins with subject matter that lends itself to assigned reading before the meetings, review at the meetings, or a material for short talks by the members. There are "Member Activity" sections to be used for discussion and self testing. They are not designed to be examinations.

Prepare lesson material in advance with input from members if possible. No two meetings in the project will be exactly alike, just as no two members are alike. Adapt your meetings according to your members' abilities.

With the club recreation officer or committee, plan recreation activities for members who arrive early for the meeting.

Plan to keep the meetings short and moving along at a comfortable pace.

Have progress and assignment reviews. Members could work together to find answers from the member manual or other resources.

Discuss the lesson. Have individuals report on both the reading assignment or member activity, or any outside experience relating to the lesson.

Organize group activities and try to involve everyone. This allows members to do, as well as listen.

As the leader, listen to members' words and actions and give praise or gentle correction when appropriate.

Plan family participation occasionally. This creates parent interest and input, especially important in observation of animals.

**MEETING PLANNING AND PREPARATION**

The 4-H Leader Guide is designed to suggest teaching methods for presenting technical information and involving youth in learning. Recognizing the differences in age, background and interests of the Veterinary Science 4-H member, each volunteer leader should select the methods which are best suited for the group. Interest can be increased if the leader:

- uses a variety of methods and resources such as slide/tape sets and outside speakers.
- challenges the ability of the youth with care not to discourage them with technology beyond their ability.
- is well prepared before each meeting.
- involves youth in activities that reinforce the material in the 4-H member's manual and makes learning an experience that is fun.

The specific suggestions for each lesson follows a similar pattern. Select the most appropriate for the meeting lesson plan.

**WORDS TO KNOW**

These are the new terms introduced in the lesson. Regularly review terms from past lessons as they relate to the topic being studied. Techniques which may be useful:

- study and discuss definitions at the meeting.
- select youth at random to give definitions of terms.
- ask individuals or teams to explain concepts using specific terms.

Example:

- What is inflammation?
- How do you recognize inflammation?
- What causes inflammation?
- How does inflammation help the body recover from injury or disease?

**SLIDE SETS**

A slide set identified with the same title as the lesson is available for each lesson in Units I and II. Use of the slides may be arranged through the County Extension Office, 4-H Visual Aid Loan Library, or purchased from Educational Aids, National 4-H Council, 7100 Connecticut Avenue, Chevy Chase, Maryland 20815.

The slide set for each lesson covers the major concepts for that lesson. The slides may be used:

- to introduce the lesson material.
- to complement the lesson discussion.
- as a summary of the lesson material.

It is important for the leader to review the slide set before a showing. Look for areas in the slide set that may not be clearly understood. Prepare for additional explanation if necessary. Formulate questions to stimulate further discussion or to clarify the material being covered.

Additional visual aids may be available on health-related topics associated with a specific species, particularly if that species is being carried as a project animal. For example a film on parvovirus in dogs would be of interest to the 4-H youth enrolled in the dog project.
Discussion questions help the youth understand the concepts after they have learned word definitions. Discussion can be stimulated with an example or illustration. An animal with an inflamed joint or someone in the group with a swollen injury can demonstrate some of the characteristics of inflammation and serve as the focus for discussion.

Individual activity participation is important. Observations of a pet or project animal is desirable because of the personal interest in their own animal. Mini reports and demonstrations place responsibility on the individual and is useful in giving the youth an opportunity to contribute to the group.

Group activity adds interest and fun to the learning process and encourages the youth to learn from each other. Some youth enjoy competition with each other but not all respond positively to competitive learning exercises. Do not over-use competitive activities particularly if there are any members of the group who never win!

Outside resources (veterinarians, science teachers) can be valuable in relating routine incidents that occur. An explanation, for example, of why accurate animal histories are so important would be desirable.

Relate to the community and encourage development of civic and citizenship responsibilities. An exhibit, a speech or demonstration provide opportunity to share personal interest and knowledge in community activities. Assist in planning and conducting a pet health clinic or a rabies vaccination campaign. These are examples of how veterinary science members may use their knowledge in becoming involved in the community.
PROJECT OVERVIEW, UNIT I
THE NORMAL ANIMAL

This brief summary of the objectives for Unit I, The Normal Animal and a description of the material to be presented will provide an overview of the material to be covered in Unit I.

Objectives of Unit I, The Normal Animal. To increase member's:
• ability to recognize normal from abnormal.

An understanding of normal attitude, behavior and characteristics of an animal becomes the basis for recognizing symptoms of disease. Unit I is devoted to recognizing the appearance, behavior and functions of normal animals.

• interest in animal health and veterinary medicine.

Anyone who works with animals will benefit from knowing about animal health and the profession devoted to animal care and welfare.

• understanding of scientific facts necessary to make timely and accurate decisions.

For youth to assume responsibility for the care of animals requires a knowledge of animal physiology so that decisions regarding injury and disease are handled appropriately.

• concept of disease prevention through knowledge of body functions, animal hygiene and environmental sanitation.

Most animal diseases can be controlled by sound management practices that remove the threat before serious problems occur. Thinking ahead regarding preventive steps is a habit and frame of mind that young people need to acquire.

Material to be presented:
• The veterinary medical concept and related career activities.
• Examples of normal vs. abnormal animal traits and habits.
• Methods of communication with animals (voice, sounds, establishing habits by regular routine).
• Examples of poor vs. good management and nutrition.

• Disease and parasite prevention techniques.
• Differences in cleaning vs. disinfection.
• Illustrations of environmental damage and health hazards in the handling of agricultural chemicals.
• Illustrations explaining the complex make-up of the living animal (cells, tissues, organs and systems).

REPORTS AND RESOURCES

Aside from the material found in the member and leader manuals or the audiovisual aids, you might want to consider:
• A discussion of reports from members on the reasons for animal health. Have members gather data on money loss, animal suffering and human grief.
• Having a member or members report on spending a day with a veterinarian in private practice, industry and/or educational institutions. The member(s) should present a diary of activity including whether preventive or treatment veterinary medicine was practiced.
• A report by an older member on the preparatory courses required for the various careers in veterinary medicine (veterinary technician, pre-veterinary, and veterinary schools). Have the member get a university catalog showing all courses involved in attaining a Doctor of Veterinary Medicine degree (D.V.M. or V.M.D.). This information illustrates the importance of the basic sciences in animal health and disease prevention.
• Inviting a veterinary technician or veterinarian (practitioner, industry, or university) to be a guest at one meeting. This would offer the members a chance to ask questions about both specific practices or career opportunities.
• Mini-reports on the following questions:
  a. Why is recognizing the normal important?
  b. What is anatomy and why is it important?
  c. What is physiology and why is it important?
  d. What is cleaning and disinfecting?
  e. Why is it important to know how agricultural chemicals should be handled?
  f. How can someone help prevent disease and parasites?
  g. Why is it important to contact a veterinarian early if your animal is sick?
  h. What are some current, local animal health problems?
Unit I, Lesson 1

Attitude and Behavior

OBJECTIVES

To teach 4-H’ers how to recognize abnormalities in animals. Members must be familiar with the normal habits, attitudes and behavior of their animals to be able to recognize the abnormal. Care must be taken not to confuse attitude changes in the body due to exercise, weather or other factors with signs of disease. For example, the heart and pulse rate of a dog will increase if the dog is frightened or nervous although the animal is not sick. Observations should be made according to a standard procedure and preferably at the same time everyday. Records of pertinent data for future reference are important. Seek help from others if unexplained observations are noted.

SUBJECT MATTER AND ACTIVITY

The material in Lesson 1 has to do with the normal animal as it relates to attitudes, behavior, posture, movement, voice, appetite, and sexual activities. The first three lessons will be devoted to factors that should be observed to know a normal animal. These principles apply to any animal. The 4-H member may therefore choose any animal that is appropriate for this project.

WORDS TO KNOW

attitude, behavior, breed, diagnose, normal, pitch, species, stance, signs

THINGS TO DO

1. Ask members to define the “Words to Know.”
2. Have members express some different attitudes that one species may have but another may not (such as the independent nature of a cat).

Awareness of the normal is the key of this section. Four-H members may develop a greater appreciation by observing the normal attitude of a number of animals.

Following Lessons 1, 2 and 3, members are asked to record information on the material presented in each lesson using their own project animals. The “Animal Record Sheet” found after Lesson 1 can be duplicated or used as an example for members to make their own record sheets.

Have members record only the information they learn about after studying each lesson (Example: After Lesson 1 on Attitude and Behavior, have the members observe their project animals and record information on attitude, eating and temperament). Record this information for a 10-day period following each lesson.

Continue to have the members watch their animals throughout the project for any abnormal signs or activities. Discussion of any abnormal signs or activities should be encouraged at every meeting.

It is advisable to have an easily handled animal available for this meeting. After discussing the background material ask the members to observe the animal’s attitude, behavior, posture, movement and voice. Direct them to observe their project animal for these points when they return home.

Discussion will help in this section since this meeting will primarily be for organization. Discuss the general outline of the next seven lessons and review some of the background and scope of the veterinary professions.

ACTIVITY SHEET

At the end of the section there is a sheet called, “Member Activity.” It lists a variety of questions designed for members individually and for the club. Questions may be answered and the blanks filled in either at the club meeting when this unit is presented or as a review at the following meeting. The questions are not designed to be used as a test, but more as a self check for level of learning.

As the members attend the first meeting and discover the fun that is associated with learning about animals, enthusiasm should increase. A means of evaluating the first lesson may be found in the following questions:

1. Did members understand the purpose?
2. Did they express interest in the discussions?
3. Were members given a chance to participate?
4. Do the members have something to look forward to at the next meeting?
5. Were mistakes made that can be prevented?

LOOKING AHEAD TO LESSON 2

Lesson 2 continues the idea of observing the animal’s normal functions and includes such areas as the skin, mucous membranes and the intestinal tract. Biology, science and health books used in both elementary and high school are an excellent source of additional information. They may be well illustrated to form the basis of your discussion. A comparison may be made with the same features in the human body, which should stimulate interest.

TO BE DONE BEFORE NEXT MEETING

Parent cooperation can be quite helpful. Contact each family by personal visit, phone call or letter. It is an excellent chance to explain the 4-H Veterinary Science program and ask for assistance. Some possible projects for members might be:

- Assign members to look up the history of the species of their project animal.
- Assign members to determine the amount and types of food their project animal might consume daily.
- Ask a few members to bring their project animals to the next meeting. Only appropriate, quiet disposition animals should be selected.
- Have members read Lesson 2, and Lesson 1 if not done before.
- Start recording data on the record sheet about project animals, the factors discussed in Lesson 1.
# ANIMAL RECORD SHEET

<table>
<thead>
<tr>
<th>Kind of Animal</th>
<th>Age</th>
<th>Average Temperature for Species</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Animal</td>
<td>Sex</td>
<td>Average Pulse Rate for Species</td>
</tr>
<tr>
<td>Color and Markings</td>
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<td>Average Respiration Rate for Species</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Attitude: (normal-abnormal)</th>
<th>M</th>
<th>T</th>
<th>W</th>
<th>TH</th>
<th>F</th>
<th>S</th>
<th>S</th>
<th>M</th>
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<th>W</th>
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<tbody>
<tr>
<td>Posture: (normal-abnormal)</td>
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<td>Locomotion: (normal-abnormal)</td>
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<tr>
<td>Voice: (normal-abnormal)</td>
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## Eating:

- Appetite: (normal-abnormal)
- Chewing motions: (normal-abnormal)
- Swallowing: (normal-abnormal)

## Temperament

## Skin:

- Color
- Evidence of injury: (yes-no)
- Condition of hair or feathers

## Mucous membranes:

- Color
- Dryness
- Odors
- Discharges

## Intestinal discharges:

- Color
- Consistency

## Body Temperature °F

## Pulse rate/minute

## Respiration rate/minute

## Other observations
The Skin, Membranes, and Intestinal Discharges

PROGRESS AND ASSIGNMENT REVIEW:
1. Review the "Member Activity" in Lesson 1.
2. Have one or two members display their project animal and discuss its history.
3. Have a report on daily quantities of food eaten by project animals.
4. Review recorded information on project animals.

OBJECTIVES
Lesson 2 is a continuation of more ways in which to determine the normal animal. Although abnormalities in the attitude and behavior of the project animal are conditions of the state of health, the skin or coat, mucous membranes and intestinal discharges are also important. To illustrate these factors, a live animal would be quite helpful in this lesson. Health is no accident. It is the result of careful training, care and feeding. An animal must be in good health to enjoy life and the owner has the responsibility of helping maintain this health.

SUBJECT MATTER AND ACTIVITY
A suggested procedure for Lesson 2 might be to review the items listed that members should know after studying this lesson, to present one or more demonstrations relating to the subject matter and to complete the "Member Activity" section. The group may be divided into smaller groups to form answers and ask other questions. Groups may exchange these questions and answers to increase their understanding and learning.

WORDS TO KNOW:
coat, ingestion, mucous membranes, pigments, skin

LOOKING AHEAD TO LESSON 3
Lesson 3 completes the basic section on normal body functions and their measurements. It discusses the proper use of a thermometer, variation in normal body temperatures, the pulse, respiration rate, how to count it, and the effect of high temperature. Biology books and resource people used in Lesson 2 may provide additional background information for Lesson 3.

TO BE DONE BEFORE NEXT MEETING
- Ask members to read Lesson 3 before arriving at next meeting.
- Ask members to record information on skin, mucous membranes and intestinal discharges on the Animal Record Sheet for a 10-day period.
- Ask one or two members to bring appropriate project animals to be used at next meeting to monitor these various factors.
- Arrange to bring thermometers and stethoscopes for next meeting (may be borrowed from local veterinarian, medical doctors or the health office).
- Have members list the things that may be learned from the use of a stethoscope to be discussed at the next meeting. Examples: lung sounds, heart rate, heart valve sounds, etc.
Body Temperature, Pulse and Respiration Rate

PROGRESS AND ASSIGNMENT REVIEW
1. Review the high points of Lesson 2.
3. Review recorded information on project animals of different species.
4. Ask members to report information recorded on skin, mucous membranes and intestinal discharges as assigned in the previous lesson.
5. Complete other assignments.

OBJECTIVES
Lesson 3 completes the study of the normal animal and is intended to create more interest as animal functions are recorded. Rectal thermometers should be made available for study in this lesson. The proper use and reading should be stressed. It may be wise to practice the demonstration by taking the temperature, pulse and respiration rate before the meeting begins. Thermometers and stethoscopes may be borrowed from your local veterinarian or medical doctors.

SUBJECT MATTER AND ACTIVITY
Lesson 3 can best be handled by a brief discussion of the "Member Activity", how to use a thermometer, areas to take the pulse and methods of observing and counting the respiration rate. Demonstration can best be done on project animals that one or two members were assigned to bring to this meeting. Discussing the thermometer, how it works, and the proper way of using it to obtain an accurate temperature would be appropriate. Pulse rates may be defined so that the members may better understand what to look for in their project animals. The stethoscope may be taken apart and re-assembled so members will understand it. It would be well to visit the local veterinarian before the club meeting and have him point out some of the factors that relate to the subject. Perhaps he may even attend and help with the discussion of the topic.

WORDS TO KNOW
pulse, respiration, artery.

THINGS TO DO
1. List and discuss the methods of restraint used on the various species (muzzling, taping, twitching, cattle chutes, ropes).

LOOKING AHEAD TO LESSON 4
Lesson 4 is a change of pace in that the maintenance of animal health is discussed in general. It discusses disease as an old problem, steps in animal management, such as providing adequate housing, adequate sunlight and exercise, grooming, sanitation, injury, and clean feeding utensils. It also discusses proper feeding and offers several suggestions where additional information may be obtained. General disease prevention and control are stressed.

TO BE DONE BEFORE THE NEXT MEETING
• Read lesson 4.
• Ask members to prepare a short demonstration on adequate housing for their project animals.
• Ask members to record the body temperature, pulse and respiration rate on their record sheet before the next lesson.
• Ask other members with unusual project animals to bring them to the next meeting for discussion.
• Ask a few members to prepare a short demonstration on some phase of animal care concerning their project animal (housing, exercise, immunity).
Maintaining Animal Health

PROGRESS AND ASSIGNMENT REVIEW

1. Ask one member who has a project animal available to briefly review the factors discussed in Lessons 1, 2, and 3.
2. Have one or more members with unusual project animals give a short demonstration on their project animals.
3. Arrange for a short discussion concerning housing of a project animal as assigned in previous lessons.
4. Review recorded information on project animals as covered in the previous lesson.
5. Complete other assignments.

OBJECTIVES

To teach the participant the concept that maintaining animal health is more than treating animals when disease strikes, or administering medicine and vaccines. This lesson deals with general management and its relationship to disease and health, the advent of antibiotics and disinfectants, and the importance of proper housing. Sunlight, exercise, grooming, nutrition and sanitation are also stressed as important in maintaining healthy animals. Disease prevention and control are key areas in this lesson.

SUBJECT MATTER AND ACTIVITY

This lesson is one of the most important for animal owners. Time should be allocated to review the “Member Activity.” Demonstrations may be presented on proper housing as assigned. These questions should provide the basis of active discussion concerning the maintenance of animal health. Have each member of the class participate in the “Member Activity.”

WORDS TO KNOW

antibodies, contagious, immunity, incubation, nutrients, resistance, vaccine.

THINGS TO DO

1. Leader questions to members:
   a. Name 3 methods to help prevent disease.
   b. How does good housing help prevent disease?
   c. Does disease control eliminate disease or just minimize it?

LOOKING AHEAD TO LESSON 5

Lesson 5 is concerned with cleaning and disinfection of housing and equipment. Cleaning procedures and general rules for using disinfectants are discussed. Specific disinfectants are listed showing advantages and disadvantages. This lesson is especially important since the principles involved also apply to the club member’s own home. A better understanding of agricultural chemicals and disinfectants is necessary in today’s environment to provide safety to animals and man.

TO BE DONE BEFORE THE NEXT MEETING

• Ask members to read Lesson 5 before arriving at the next meeting.
• Ask several members to bring samples and labels of common disinfectants or chemicals that are used at home.
• Ask one or two members to prepare a demonstration at the next club meeting on the proper steps of disinfecting with three different types of disinfectants.
• Have a member or two prepare a safety display on handling chemicals.
• Acquire some University Extension circulars on handling livestock sprays for external parasites.
• Have members continue to watch their project animals for any abnormal signs or activities, even though they are not recording the information.
Cleaning and Disinfection

PROGRESS AND ASSIGNMENT REVIEW
1. Review "Member Activity" to Lesson 4.
2. Have one or two members report or give a demonstration on sanitary procedures carried out with their project animal.
3. Complete other assignments.
4. Discuss any abnormal signs or activity noticed by members in their project animals.

OBJECTIVES
To point out that cleaning and disinfection is a major step in the prevention of disease and the maintenance of animal comfort is the major objective in this lesson. Without sanitation, other factors such as vaccination and other points of disease control would be limited. Sanitation is important not only in animals, but also in the club member's daily life. The principles learned in this lesson will be helpful in maintaining a healthful environment at home.

SUBJECT MATTER AND ACTIVITY
This section on cleaning and disinfectants is important and should be easy to conduct. A demonstration type presentation concerning cleaning procedures and the general rules of disinfectants can be used for this lesson. Various types of sanitizing agents should be available for the demonstration. Extension circulars contain rather complete information on disinfectants and how they work. Your local Extension agent can obtain materials and information on sanitation. Club members may collect information on various disinfectants and make a file that may be usable at a later date.

WORDS TO KNOW
disinfect, organic matter

THINGS TO DO
Leader or members:
1. Acquire labels from several agricultural chemicals and discuss safety, handling and disposal procedures.
2. What about dosages and do they vary with species or animal ages?

LOOKING AHEAD TO LESSON 6
Lesson 6 deals with the structure and function of the animal body. It starts with a single cell and the basic building material of the cell called "protoplasm." The features of a single cell are discussed. Specialization of cells such as nerve cells, blood cells, bone cells, fat and muscle cells are discussed and shown as they work together to make tissues. Again sources of good supplementary information are biology, health and science books. These books also will be used for the remaining lessons of Unit I.

Lessons 6, 7 and 8 all cover the structure and function of the animal body. Lesson 6 will involve cells and the development of cells to form tissue. Lesson 7 involves the development of tissues to form organs. Lesson 8 deals with the development of the organs to form systems that function together in the whole body.

TO BE DONE BEFORE NEXT MEETING
- Ask members to read Lesson 6.
- Ask one or two members to prepare a demonstration on the parts of a single cell using a poster or modeling clay.
- Again ask one or two of the members to bring project animals to the next meeting and discuss any significant changes that have been observed.
- Arrange, if possible, to borrow a microscope and a tissue slide to look at individual cells. Materials may be borrowed from your local veterinarian, health department or the biology laboratory at the high school. It may be possible to invite your local veterinarian or the high school biology teacher to assist.
- Have members continue to watch their project animals for any abnormal signs or activities, even though they are not recording the information.
The Cells of the Animal Body

PROGRESS AND ASSIGNMENT REVIEW

1. Review questions to Lesson 5.
2. Discuss “Member Activity” about cells, specialization, cytoplasm.
3. Ask for demonstrations on parts of a single cell using posters or modeling clay.
4. Arrange demonstration of a single cell using microscope and other material as listed in the lesson.
5. Discuss any abnormal signs or activity noticed by members in their project animals.

OBJECTIVES

To illustrate that it is necessary to study the structure of the cells of an animal body (anatomy) and how it works (physiology) if one is to understand the basic complexities of life.

SUBJECT MATTER AND ACTIVITY

The animal’s body can be defined as being a living mechanism composed of systems and organs all working together. This complex mechanism is made up of billions of individual cells each having a function to perform to keep the animal alive and healthy. Although a cell is extremely complicated, a single cell can be described for basic teaching. Cells may be diagrammed by using posters or models. Cells may be compared to building blocks which are specialized to do certain jobs.

WORDS TO KNOW

anatomy, cells, physiology, protoplasm, cytoplasm, specialization

THINGS TO DO

Have members make a list of cells indicating a few types of cell specialization: Example; epithelial - covers the body (skin), lines the mouth, and secretes digestive enzymes (glands).

LOOKING AHEAD TO LESSON 7

Lesson 7 continues the structure of the animal body by discussing the development of tissues and organs from single cells. The four tissue types are discussed (connective, muscle, nerve, epithelial). These tissue types combines and work together to form organs.

TO BE DONE BEFORE THE NEXT MEETING

To provide materials for the discussion of Lesson 7, different types of tissues may be secured from the meat department of a grocery store or a butcher shop. Samples might include ligaments, cartilage, tendons, various types of muscle tissue, brain or nerve tissue and skin. Examples of organs may consist of eyes, heart, lungs, kidney, stomach, etc. These specimens could be frozen or refrigerated and used in this manner with little difficulty. Cutaway models of animals may be helpful in Lesson 7 and the assistance from a veterinarian is desirable.

- Have members read lesson 7 before the next meeting.
- Plan a tour of a local butcher shop, slaughter house or packing plant to observe examples of tissues and organs.
- Have members continue to watch their project animals for any abnormal signs or activities, even though they are not recording the information.
The Tissues of the Animal Body

PROGRESS AND ASSIGNMENT REVIEW

1. Review questions and answers to Lesson 6.
2. Review "Member Activity" - definitions.
3. Ask a member to demonstrate the four types of tissues using posters or actual specimens. These may be obtained at a butcher shop, meat department or local packing company.
4. Have a member make a drawing of several types of tissues working together. Example: bones connected to each other (ligaments), with muscle attached to bone (tendons). This is an example of muscle and connective tissue.
5. Discuss any abnormal signs or activity noticed by members in their project animals.

OBJECTIVES

Lesson 7 is a continuation in the study of the structure (anatomy) and function (physiology) of the animal body. The basic principles involved in this lesson apply to the human body as well as those of animals, so as the members learn about their project animal, they also learn about themselves.

SUBJECT MATTER AND ACTIVITY

Tissues are a group of similar cells performing a similar activity. The four general types of tissues are discussed individually: epithelial, connective, muscle and nerve. Tissues combine to form an organ which can perform one or many duties. Examples of organs are eyes, ears, heart, lungs, kidneys, stomach, etc. One of the largest organs of an animal's body is the skin. It provides protective covering over the body along with many other functions. Health, biology, and science books contain beautiful pictures and illustrations concerning cells, tissues and organs. Consult a biology teacher or a veterinarian for assistance with this particular lesson.

WORDS TO KNOW

tissues, organ, contraction, matrix, system

THINGS TO DO

Have members make a list of and have a group discussion on various tissue functions. Examples: connective tissue - supports body, helps locomotion; connective tissue and epithelial (skin) - encloses, protects body; nerve tissue, aids in movement, thinking, controls body function.

LOOKING AHEAD TO LESSON 8

Lesson 8 starts with the development of body systems and discusses examples of four of these systems. Short demonstrations illustrating a system are advisable. There are plastic models of the various systems that could be used to great advantage. Members of the group already having plastic models could perform demonstrations at the next meeting. A veterinarian may have materials that apply to this lesson.

• Compare similar organs in poultry with that of a fish or a meat animal that has been slaughtered.
• Have a group of members role play the major organs of an animal. Each person describes the organ and the functions that organ performs.
• What do you think can go wrong with an organ that could cause it to malfunction?
  a) Tumor
  b) Disease
  c) Poor blood supply
  d) Other things vary as to which organ
• Have members continue to watch their project animals for any abnormal signs or activities, even though they are not recording the information.
Unit I, Lesson 8

The Organs and Systems of the Animal Body

PROGRESS AND ASSIGNMENT REVIEW

2. Discuss the material in Lesson 8 and have assigned demonstrations or discussions performed.
3. Special assignments should be completed.
4. Discuss any abnormal signs or activity noticed by members in their project animals.

OBJECTIVES

The lesson on systems is intended to illustrate that many organs work together to make an animal function. This is basic anatomy and physiology. The members should now be able to understand the basics of how an animal is put together. They should have a better understanding of how an animal's body functions and how good animal management helps keep the animal healthy.

SUBJECT MATTER AND ACTIVITY

The instructional material in Lesson 8 is adequate for a full session. Assignments made in the previous lesson should be completed. Since this is the last session in Unit I, a review and summary of all the previous lessons should be made, possibly during a supplemental session the following week.

WORDS TO KNOW

ruminants, pulmonary, oxygenated, monogastrics, A.V. valve

THINGS TO DO

1. Diagram the digestive system and illustrate differences between a monogastric and ruminant type animal.
2. Have members make a list of several disease disorders that can affect each of the four systems discussed in Lesson 8.
3. Conduct a quiz bowl. Divide members into two teams. Each person makes up 5-10 questions concerning systems and organs. Have a moderator ask the questions and award points for correct answers and deduct points for incorrect answers. High point team wins!
PROJECT OVERVIEW, UNIT II
ANIMAL DISEASE

Objectives of Unit II Animal Disease. To increase the member’s:

• ability to recognize abnormal from normal.

Unit I Veterinary Science is devoted to recognizing the normal appearance, behavior and function of animals which is necessary before the abnormal can be identified. Reference to Unit I may be necessary if the youth do not remember the principles learned there.

• understanding of veterinary science terminology

It may not be possible for all members to fully understand all of the terms used in the manual, however, the goal should be for each individual to learn as many of the scientific words as possible. This knowledge is the key to moving to advanced comprehension of veterinary science. Better communication with the veterinarian will occur as more of the terms in the lessons become a part of the members’ vocabulary. An understanding of scientific facts is necessary to make timely and accurate decisions about disease.

• appreciation for the importance of good management and sanitation.

Knowing why certain management practices are important and the consequences of poor management will help both the youth and the parent deal with day-to-day situations. Good management will reduce the possibilities of disease development.

• knowledge of animal disease causes, development, prevention and protection mechanisms.

An ‘ounce of prevention’ may be worth much more than a ‘pound of cure’. Animal disease is costly in loss of production, medicine, death of an animal and possible disease transmission to other animals and humans. Diagnosis is the role of the veterinarian but an understanding of disease helps the animal owner to realize when to consult the professional.

• understanding and appreciation of veterinary medicine and its career possibilities.

Youth are exposed to many career possibilities during their developing years. Veterinary medicine can be a very desirable choice for those with aptitude and abilities in this area.

• leadership experience.

Leadership and citizenship experiences as with other fields are evident here and will develop further when working with animals and animal health. Encourage youth to use their knowledge to help others and to address animal and human problems whether they are around the home, the farm, or the community.

MATERIAL TO BE PRESENTED

Lesson 1 Introduction to Disease
General classification of disease agents.

Lesson 2 Bacteria and Disease
Characteristics of bacteria and examples of diseases caused by bacteria.

Lesson 3 Viruses and Viral Disease
Characteristics of viruses and examples of viral diseases.

Lesson 4 External Parasites
Examples of external parasites, life cycles, effect on animals and control measures.

Lesson 5 Internal Parasites
Examples of internal parasites, life cycles, effect on animals and control measures.

Lesson 6 Nutrition and Disease
To illustrate that it is necessary to feed a properly balanced diet to keep animals healthy. To stress again the importance of management in animal husbandry, and the need for quality food.

Lesson 7 Poisons and Disease
The effects of both natural and man-made poisons and the safe handling of toxic materials.

Lesson 8 Stress and Disease
The lesson on stress, both desirable and undesirable illustrates that all humans and animals are exposed to constant stress. To also make the 4-H’er aware that there is a level of stress that can adversely affect anyone or anything, however, some individuals can withstand a certain stress level much better than others.

Lesson 9 Heredity and Disease
Lesson 9 introduces the 4-H’er to the fact that some diseases are directly caused by hereditary weakness. Again, the management factor is present, as selection of proper breeding animals is a key. The basic principles involved in this lesson apply to the human body as well as those of animals, so as the members learn about their project animal, they also learn more about themselves.

Make use of audiovisual materials and lesson aides which follow the Veterinary Science Program.
The following slide/tape programs are available to supplement the lessons in the 4-H member's manual. Contact the Extension office for information regarding loan or purchase of these sets. Other appropriate visual aids may also be available. Order audio-visual aids well in advance of the date they are needed.

Unit II, Lesson 1 - Introduction to Disease
Unit II, Lesson 2 - Bacteria and Disease
Unit II, Lesson 3 - Viruses and Disease
Unit II, Lesson 4 - External Parasites
Unit II, Lesson 5 - Internal Parasites
Unit II, Lesson 6 - Nutrition and Disease
Unit II, Lesson 7 - Poisons and Disease
Unit II, Lesson 8 - Stress and Disease
Unit II, Lesson 9 - Heredity and Disease

Note to Leader: Be concerned with safety around pets and livestock. Avoid conditions such as overcrowding, or excess noise because someone could be bitten, kicked or scratched. This environment is unusual for an animal and you therefore must plan ahead to reduce these risks.
Unit II, Lesson 1

Introduction to Disease

OBJECTIVES
To teach 4-H'ers how to recognize the abnormalities associated with disease in animals. Members must be familiar with the normal habits, attitudes and behavior of their animals to be able to recognize the abnormal. Care must be taken not to confuse attitude changes in the body due to exercise, weather or other factors with signs of disease. For example, the heart and pulse rate of a dog will increase if the dog is frightened or nervous although the animal is not sick. Observations should be made according to a standard procedure and preferably under the same conditions every day. Records of pertinent data for future reference are important. Seek help from others if unexplained observations are noted.

SUBJECT MATTER AND ACTIVITY
The material in Lesson 1 explains disease, inflammation, and injury and the animal's ability to protect itself from disease. Disease-causing agents, their spread and control are discussed, stressing some disease defense systems.

WORDS TO KNOW
- disease, pathogenic, infection, contamination, lesion, toxins, endotoxins, exotoxins, antitoxins, antigen, inflammation

Suggestions for Your Meeting Plan
- Ask members to define the "Words to Know."
- Have members describe some different attitudes that may be determined as a symptom or "sign" of disease. Examples: appetite, walking, elimination of body wastes, body fluid and secretion consistency, presence of inflammation, temperature, general appearance.
- Ask members how often the project animal should be observed.
- At what point does a member feel the veterinarian should be called?

Awareness of the normal animal is the key if disease problems are to be recognized. Ask members to record information on the material presented in each lesson using their own project animals. Animal health records should be maintained for reference when an animal is sick. Continue to have the members watch their animals throughout the project for any abnormal signs or activities. Discussion of any abnormal signs or activities should be encouraged at every meeting.

Have an easily-handled animal available at your meetings. After discussing the background material ask the members to observe the animal's attitude, behavior, posture, movement and voice and determine if all are normal. Direct them to continue to observe their project animal for these points when they return home.

Discussion will help in all sections. Discuss the general outline of the next eight lessons and review some of the background and scope of the veterinary profession.

ACTIVITY SHEET
At the end of the lesson there is a member activity. It lists a variety of questions designed for members individually and for the whole club. Questions may be answered either at the club meeting when this unit is presented or as a review at the following meeting. The questions are not designed to be used as a test, but more as a self check for level of learning.

As the members continue their work they will discover the importance of learning about animal disease. A means of evaluating the first lesson may be found in the following questions:
- Did members understand the purpose?
- Did they express interest in the discussion?
- Were members given a chance to participate?
- Do the members have something to look forward to at the next meeting?
- Were mistakes made that can be prevented?

LOOKING AHEAD TO LESSON 2
Lesson 2 begins with disease causes, specifically the bacteria. Biology, science and health books used in both elementary and high school are an excellent source of additional information. They may be well-illustrated to form the basis of your discussion. A comparison may be made with diseases in the human body, which should stimulate interest.

TO BE DONE BEFORE THE NEXT MEETING
Parent cooperation can be quite helpful. Contact each family by personal visit, phone call or letter. It is an excellent chance to explain the 4-H Veterinary Science program and ask for assistance. Some possible projects for members might be:
- Assign members to look up some history of animal disease.
- Assign members to determine procedures used to help sick animals.
• Ask a few members to bring their project animals to the next meeting. Only appropriate, quiet animals should be selected.
• Have members discuss the importance of management as it relates to disease.
• Have members read Lesson 2, and Lesson 1 if not done before.
• Start recording data on a health record sheet about disease of animals.

Unit II, Lesson 2

Bacteria and Disease

PROGRESS AND ASSIGNMENT REVIEW:
1. Review the "Member Activity" in Lesson 1
2. Have one or two members give examples of living and nonliving disease-causing agents.
3. Discuss disease resistance or immunity.
4. Discuss inflammation significance and the suffix "itis."

OBJECTIVES
To teach 4-H members about bacteria and the role in disease development. The characteristics of bacteria, their ability to sometimes multiply rapidly and why some animals are more subject to these diseases are discussed.

SUBJECT MATTER AND ACTIVITY:
Characteristics of bacteria and conditions in which disease develops from the bacteria is the key to this lesson.

SUGGESTIONS FOR YOUR MEETING PLAN
Activities for Lesson 2 might include review of the items listed that members should know after studying this lesson. Further activity may include:
• Ask the members to define the "Words to Know."
• Have members give examples of some bacterial diseases.
• Have the members describe cocci bacteria and bacilli-type bacteria.
• Have the members discuss the sources of bacteria and how bacteria are spread.
• Topics for visiting veterinarian: What does the veterinarian look for in making a diagnosis? How can the animal owner help?

• Suggested individual report: Why is veterinary science knowledge important for the farmer, pet owner, sale barn operator, wildlife manager, zoo manager, community residents who own no animals? (Select one)
• Demonstration: How the veterinarian uses the microscope.

WORDS TO KNOW
bacteria, classify, dormancy, flagella, pathogens, spores

LOOKING AHEAD TO LESSON 3
Lesson 3 exposes the members to viruses and viral disease. The viruses are disease-causing agents, thousands of times smaller than the bacteria.
Viruses and Viral Disease

PROGRESS AND ASSIGNMENT REVIEW
1. Review the high points of Lesson 2 and discuss where bacteria are found.
3. Discuss motility of bacteria.
4. Ask members to report about bacterial spores and their significance.
5. Ask a member to discuss how viruses differ from bacteria.

WORDS TO KNOW
asymptomatic, interferon, antiserum, vaccine, replication, immunity, dehydration, incubation period, reportable disease

OBJECTIVES
To inform 4-H members about viruses and their ability to cause disease in humans and animals. To further inform of the variation in severity of disease of viruses dependent upon virus type, tissue infected, and the animal's ability to resist the specific virus.

SUBJECT MATTER AND ACTIVITY
The characteristics of viruses and conditions necessary for disease development and examples of several serious and costly virus diseases are discussed.

SUGGESTIONS FOR YOUR MEETING PLAN
Activities for Lesson 3 may include discussion of those questions listed in the Lesson 3 manual "after reading this unit." Further activity may include:

- Definition of "Words to Know."
- Have members give examples of some virus diseases in humans and animals.
- Have members discuss several methods of spread of various viruses.
- Individual Assignments: Suggest making a list of the most common or most dangerous disease which may effect the project animal. Find out all you can about one of the diseases:
  What are the signs?
  What type of organism causes the disease (bacteria, virus, parasite, etc.)?
  How does the disease affect the animal?

- Topic for visiting veterinarian:
  Where does the veterinarian go for help?
  Tour a diagnostic laboratory if possible.

LOOKING AHEAD TO LESSON 4
Lesson 4 is in contrast to bacteria and viruses because external parasites are discussed. Although a parasite is not a disease, the effects from its presence cause disease. It is also a disease carrier. The external parasite, life cycle, control and effects are stressed.

TO BE DONE BEFORE THE NEXT MEETING
- Read Lesson 4
- Ask members to illustrate or show an external parasite.
- Ask members to record a list of adverse effects of external parasitism.
- Ask members to prepare a short demonstration on some type of external parasite control concerning their project animal.
- Review handling of external parasite chemicals from Unit I, Lesson 4
External Parasites

PROGRESS AND ASSIGNMENT REVIEW
1. Ask one member to briefly review the disease factors discussed in Lessons 2 and 3.
2. Have one or more members give a short discussion on virus disease prevention in their animals.
3. Arrange for a short discussion concerning rabies.
4. Complete other assignments.

OBJECTIVES
To teach the participant the dangers to animals from external parasite infection. This lesson deals with external parasitism and its relationship to disease. External parasite control and dangers of disease transmission are key areas of this lesson.

SUBJECT MATTER AND ACTIVITY
This lesson is one of the most important for animal owners. Time should be allocated to review the "Member Activity."

SUGGESTIONS FOR YOUR MEETING PLAN
- Demonstrations may be presented on sanitation to prevent these parasites from spreading disease.
- Have each member of the class participate by answering a different question in the "Member Activity" section.
- Individual Assignment: Have the members describe how they would handle an animal that died of an infectious disease and how to dispose of the carcass.
- What precautions should be taken?

TO LEADER: Disposal can be done in several ways:
Deep burial - avoid sites predators would disturb or areas that may contaminate water supplies.
Cremation - you must observe burning laws or take the carcass to an incinerator.
Rendering companies - agencies which dispose of dead animals.

WORDS TO KNOW
parasite, ectoparasite (external parasite), vector, quarantine, life cycle, unthriftiness

LOOKING AHEAD TO LESSON 5
Lesson 5 is concerned with internal parasites and disease caused by their activity. The parasite, its life cycle and control are discussed with a few specific common parasites of domestic animals being stressed.

TO BE DONE BEFORE THE NEXT MEETING
- Ask members to read Lesson 5 before the next meeting.
- Ask several members to bring actual, or pictures of, common internal parasites that can affect their animals.
- Ask one or two members to prepare a demonstration at the next club meeting on the proper ways to reduce spread of several internal parasite types.
- Acquire some Extension circulars on handling livestock dewormers or internal parasites.
- Have members continue to watch their project animals for abnormal signs or evidence of internal parasites.
PROGRESS AND ASSIGNMENT REVIEW
1. Review “Member Activity” to Lesson 4
2. Have one or two members report or give a demonstration on sanitary procedures carried out with their project animals as they relate to external and internal parasites.
3. Complete other assignments.
4. Discuss any abnormal signs or activity noted by member in their project animals that suggest parasites or disease.

OBJECTIVES
To introduce and teach the 4-H’er the dangers of internal parasites and point out that cleaning and sanitation is a major step in the prevention of parasitism. Without sanitation, management factors such as vaccination and other points of disease control would be limited.

SUBJECT MATTER AND ACTIVITY
This section on internal parasites is important and interesting. A description of parasite life cycles, direct and indirect hosts provide learning and activity opportunity. Activities that could apply may include life cycle and host description by poster or demonstrations. Refer to “Member Activity” for ideas on 4-H’er participation on this subject. The importance of good management is especially vivid in parasite control. Remember management is a key factor in all disease control whether parasitic, bacterial or other.

WORDS TO KNOW
intermediate host, definitive host, host specific, viable, emaciation, rupture, hemorrhage, anemia

SUGGESTIONS FOR YOUR MEETING PLAN
Leader or member may:
• Acquire labels from several deworming chemicals and discuss safety, handling and disposal procedures.
• Discuss dosages and how they vary with species or animal ages.
• Safe handling and dosage demonstrations are suggested.
• Topic for the visiting veterinarian or individual reports:
What precautions should be taken when introducing new animals to the flock, herd, or home when other animals are already there?

Key points may include:
— Signs of disease and parasitism.
— Adjusting animals gradually to avoid fighting injury.
— Testing for diseases prior to purchase if possible.
• When is quarantine important?
• Individual report:
Study one internal parasite that is common to a member’s project animal. Have members outline the life cycle of the parasite. At which stage in the life cycle does it appear to the group the parasite is most effectively controlled?

LOOKING AHEAD TO LESSON 6
Lesson 6 is concerned with nutrition and its effect on disease development in the animal body. The need for proper nutrition, how food is metabolized and conditions that create nutritional imbalances are described. Severe disease can occur from a weakness in these areas of management whether the nutrients are fed to pets or livestock. Deficiency and unbalanced feeding are capable of creating conditions that increase susceptibility to other diseases and may inhibit proper growth and development.

TO BE DONE BEFORE THE NEXT MEETING
• Ask members to read Lesson 6.
• Ask one or two members to prepare a demonstration describing an unbalanced food ration.
• Ask one or two of the members to bring project animals to the next meeting to discuss and observe possible signs of unbalanced nutrition.
• Arrange, if possible, to find pictures of deficient animals.
• Materials may be borrowed from your local veterinarian, or from animal nutrition books. It may be possible to invite your local veterinarian or extension agent to help in a demonstration.
• Have members continue to watch their project animals for abnormal signs or activities, because they should now understand the importance of close observation.
Nutrition and Disease

PROGRESS AND ASSIGNMENT REVIEW
1. Review questions to Lesson 5.
2. Discuss "Member Activity" about nutrition and disease.
3. Ask for demonstrations showing effects of nutritional deficiency using types of feed samples necessary for the growing animal.
4. Discuss any abnormal signs or activity noticed by members in their project animals.

OBJECTIVES
To illustrate the need to feed a properly balanced diet to keep animals healthy. To stress again the importance of management in animal husbandry, and the need for quality food.

SUBJECT MATTER AND ACTIVITY
The animal's body can be defined as a living mechanism composed of systems and organs all working together. However, if proper foods are not supplied, animals cannot manufacture needed nutrients. The need for balanced diets and the consequences if this fails is discussed.

WORDS TO KNOW
maintenance requirement, lactation, metabolism, nutrient, essential nutrients

Poisons and Disease

PROGRESS AND ASSIGNMENT REVIEW
1. Review questions and answers to Lesson 6.
2. Review "Member Activity" definitions
3. Ask a member to demonstrate four types of chemical poisons, either by a poster or from actual container labels. These may be obtained at home or from a veterinarian.
4. Have a member make a drawing of a negligent act that could cause a poisoning. Example: antifreeze left for a pet to consume.
5. Discuss any abnormal signs or activity of project animals.

OBJECTIVES
Lesson 7 is designed to stress the dangers of poisons, their sources and effects upon various body systems. To emphasize again, management is the key in poison prevention as in other disease reduction efforts.

SUBJECT MATTER AND ACTIVITY
Poisons are described, explaining general origins, effects of the poison on various body systems and their prevention and treatment procedures on a few of the specific toxins.

WORDS TO KNOW
toxins, neurotoxins, zootoxins, phytotoxins, endotoxins, exotoxins

SUGGESTIONS FOR YOUR MEETING PLAN
• Demonstration activity possibilities could include safety precautions around poisonous insects, snakes or chemical accidental misuse.
• Individual Assignment: Suggest members list on a chart all the toxic materials found at home, or on the farm which could be dangerous to animals. Use these subject headings:

Name of Material
Where Kept
Animal Access
How to Store Safely

Unit II, Lesson 8

Stress and Disease

PROGRESS AND ASSIGNMENT REVIEW
2. Discuss the material in Lesson 8 and have assigned demonstrations or discussions performed.
3. Special assignments should be completed.
4. Discuss the abnormal signs or activity noticed by members concerning their project animals.

OBJECTIVES
The lesson on both desirable and undesirable stress is intended to show that all humans and animals are exposed to constant stress. It will also make the 4-H’er aware that some individuals are unable to cope with a type or volume of stress, therefore causing disease development.

SUBJECT MATTER AND ACTIVITY
Conditions of stress are pointed out, showing that not all individuals react the same to a particular factor. Resistance to stress may vary according to stressor type, its duration and physical characteristics. It is again shown that with proper management the animal owner can control, to a great degree, the stressors just as can be done in other disease-prevention efforts.

WORDS TO KNOW
stress, stressor, genetic, oxygenated, monogastrics

LOOKING AHEAD TO LESSON 8
Lesson 8 discusses conditions that cause stress to systems and provides examples of stress factors. Various stress situations from the 4-H’ers homes may be of interest.
• Have members list conditions of stress that may be desirable or undesirable.
• Have members continue to watch their project animals for abnormal signs or activities. Record the information, if significant, and discuss at the next meeting.

SUGGESTIONS FOR YOUR MEETING PLAN
• Activity may include pictures or a demonstration of both favorable and unfavorable stress.
• Individual assignment concerning project animals taken to shows and fairs:
a. What may be done to reduce stress with specific project animals?
b. What possible effects from stress might you anticipate when exposing an animal to the various types of stress at a show or fair?

LOOKING AHEAD TO LESSON 9
Lesson 9 has educational material that relates to genetic or hereditary factors that predispose some types of disease. It relates not only to selective breeding for better quality animals but also mentions disease resistance from hereditary factors. Again, management is important.

TO BE DONE BEFORE THE NEXT MEETING
• Ask members to read Lesson 9 before the next meeting.
• Have members continue observing their animals and apply what has been learned from this project.
PROGRESS AND ASSIGNMENT REVIEW
1. Review questions and answers to Lesson 8.
2. Review "Member Activity" definitions.
3. Ask a member to give several examples of characteristics that are inherited.
4. Discuss any abnormal signs or activity noticed by members in their project animals.

OBJECTIVES
Lesson 9 is an attempt to introduce the 4-H'er to the fact that some diseases are directly caused by hereditary weakness. Again the management factor is present, as selection of proper breeding animals is a key. The basic principles involved in this lesson apply to the human body as well as those of animals, so as the members learn about their project animal, they also learn more about themselves.

SUBJECT MATTER AND ACTIVITY
Genetic and hereditary factors are interesting and have many ramifications. This lesson only examines the most basic concepts. Health, biology, and science books contain beautiful pictures and illustrations concerning genetics. Consult a biology teacher, geneticist, or a veterinarian for assistance if there is difficulty with this lesson.

WORDS TO KNOW
heredity, hormone, chromosomes, genes, fertilization, chromatin, embryo, trait

SUGGESTIONS FOR YOUR MEETING PLAN
• Individual Assignment:
Assume the 4-H'er is going to buy another project animal. Explain and discuss genetic disease-related traits that could cause concern.
• Discussion Topic:
Explain and discuss why animal breeders should evaluate the hereditary characteristics of their animals.
• Review Lessons 1 through 9 if desired.
• Celebrate with a party for completing 4-H Veterinary Science Unit II, Animal Disease!

4-H LEADER GUIDELINES
4-H Veterinary Science - Unit III
"Animal Health and Its Relationship to Our World"
A Self-Study Course

The 4-H Veterinary Science Program, Unit III is intended to aid in broadening the 4-H'er's scope of knowledge in veterinary medicine and animal health in our changing world. Because this is a self-study course, topics can be anything related to veterinary medicine, however, Unit III does suggest six options that may or may not apply to the participant. Suggestions address the relationship of animal health to the environment in which we live, and the influence of animal health on human health, well being, and safety.

The 4-H'er's ability to successfully proceed with Unit III will hinge upon finding good resource material and application of knowledge gained in the lessons of Unit I and Unit II of the 4-H Veterinary Science Program. The participant must also possess self determination and a desire to learn. Unit III is a self-study program that is controlled by the participant.

A topic of interest to the participant that can be realistically investigated should be selected. The objective is to not only increase participant knowledge but to stimulate resourcefulness, innovation, and creativity. It is important to select topics carefully so the participant's talents and interests apply favorably to the subject.

To determine progress, a set of goals in a certain time frame should be a part of this program. That is, a calendar of steps should be planned at the beginning of the project. The initial portion of the member's manual addresses suggestions of how to select, plan, and record progress, and evaluate the proposed endeavor.

The decisions made by the participants will be predominantly their own, therefore, the responsibility assumed will be largely self-induced.
The role of the leader in Unit III is likely to be that of counselor and advisor rather than teacher. The 4-H leader should:

- Discuss local resources and materials available.
- Evaluate the participants' ability to:
  - Be a self-starter.
  - Carry out project to completion.
  - Communicate and record written results.
  - Evaluate and analyze progress to the end.
- Provide assistance in establishing the plans as outlined in the member manual.
- Provide assistance in development of a confident "can do" attitude. This helps in becoming a better, productive citizen.
- Offer guidance in the area of neatness, accuracy, and organization for project success.
- Offer advice on the importance of parental interaction and approval.
- Be familiar with the list of resources and references in the last section of 4-H Veterinary Science, Unit III, member manual.

The titles of the suggested self-study subjects are listed in the table of contents.

An extensive listing of books and other references on Veterinary Science and related topics is included in the Unit III project guide "Animal Health and Its Relationship To Our World".

1. Environmental Influence on Animal Health
2. Animal Health as Related to Public Health
3. Animal Health as Related to Nutrition
4. Maintaining Animal Health - Immune System or Medicine
5. Practical Veterinary Medicine at Home
6. Possibilities of Veterinarian Medicine for a Career