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4-H 133 Unit III Animal Health and Its Relationship to our World: A Self-Study Course 4-H Veterinary Science

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4-H VETERINARY SCIENCE
UNIT III - ANIMAL HEALTH AND ITS RELATIONSHIP TO
OUR WORLD
A SELF-STUDY COURSE

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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.
INTRODUCTION:

The 4-H Veterinary Science Program, Unit III is designed to broaden your knowledge of veterinary medicine, animal health, and their relationship in our world. This is a self-study course from which nearly any topic can be selected; however, it should relate to veterinary medicine. Unit III suggests six options as examples of topics that may or may not be appropriate for a specific individual. The options suggested address the relationship of animal health to the environment in which we live. The interrelationship of animal health and human health, well being, and safety is discussed and possibly could be an appropriate topic. Additionally the possibility of a career in veterinary medicine or related fields can be investigated.

Your ability to advance and progress in Unit III depends upon several factors. Use of good resource material and application of knowledge gained in Veterinary Science Unit I and Unit II is necessary. You must have self-determination and possess a desire to learn, because Unit III is strictly a self-study program. The objective is to not only increase your knowledge but to stimulate resourcefulness, innovation, and creativity. It is important to select topics carefully so your talents and interests apply favorably to the subject.

In the front portion of this manual is a table of contents indicating location of support material. This material includes leader guidelines, suggested resources (references), and self-study recommendations to help you in your study.

A set of goals in a certain time frame should be a part of this program to determine progress and evaluate time elapsed for each section of a topic. The initial portion of this manual contains suggestions of how to select, plan, and record progress, and evaluate your proposed endeavor. The decisions you make will be predominantly your own, therefore, the responsibility assumed will be largely self induced.

When a topic is completed you may continue to develop other areas following guidelines of Unit III. It may be wise to select a relatively simple topic for the first time, then select a more challenging topic after that.

RECOMMENDED PROCEDURES FOR SELF-STUDY PROJECTS

The 4-H Veterinary Science, Unit III is designed to help interested participants have the opportunity for further exposure to the veterinary profession. It allows you to select, plan, and work on a project of your own design, therefore stimulating thought and initiative. In short, you control and are responsible for the development and outcome of the effort.

The following suggestions may help in planning your project:

Designing a Self-Study Project

The advantage of a self-study project is that you can study a wide range of topics that interest you and which you are capable of doing. The self-study process has three major steps which you must complete for a successful experience:

1. Develop a project plan.
2. Carry out the project using the plan as a guide.
3. Evaluate the project at the conclusion.

In a self-study project, the 4-H participant is responsible for the development and outcome of the project. Seek advice from your 4-H leader and other resources you feel could be helpful to you.

Developing the Project Plan

The basic questions of what, why, how, who and when, will need to be answered as the plan is developed. The focus should be on you, the individual. Select and design a project with these factors in mind:

1. Do you have sufficient personal interest, talent, and time? You must have sufficient time and be able to obtain resources (books, articles, or interviews with professionals) to complete the project successfully.
2. Does the project present a challenge for you? New experiences should be planned into the project.
3. Will the project be satisfying to you?
4. Will the project stimulate innovation and creativity?
5. Will there be opportunity to share the project with others?
6. Is there opportunity for your community to gain from your increased knowledge of your topic?

Selecting the topic.

Develop a list of possible topics that interest you. Start by reviewing the six suggested areas of study that follow in this manual. The list of reference titles......
in the last section of the manual may suggest further study topics. An animal health problem on your farm or ranch or in your community may be worth study. Visit with your parents, 4-H leaders, teacher, and veterinarian to discuss their ideas with you.

Narrow the list to the three topics with the most promise. Select those you are interested in, that are realistic in the time you have available and that will be worthwhile. Avoid projects already available in other 4-H projects.

From the list of three, select one topic to plan in detail. The plan will usually include the following:

1. Description: What do you want to do? (goal).
2. Justification: Why is the topic important to you and/or your community?
3. Objectives: What do you want to accomplish?
4. Title: What will you call the project?
5. Action Plan: The action plan brings you to the question of how the project will be carried out. Write down as much as you can about the action you will follow, giving careful consideration to these questions.
   • What are the steps or courses of activities necessary to reach your goal? (This becomes the list of objectives.)
     • What resources will be needed to accomplish each step? (This may include people to assist, reference material to investigate or perhaps money to support what you are planning to do.)
     • How will each step be carried out and what will be your strategy for getting it done?
     • What are the target dates for completing each step? (This becomes a calendar plan to help you complete the project by a certain time.)
     • How will you know when the project is completed? (Is there evidence you are approaching your goals?)
     • How will the project be shared, or be of use to others?

Before you work on carrying out the project:
• Are you satisfied with the plan?
• Can the problems be overcome?

If you anticipate serious problems, now is the time to make the necessary changes, or to select a new topic if it appears to be a better alternative.

INDIVIDUAL PLAN FOR 4-H VETERINARY SCIENCE SELF-STUDY PROJECT
(Suggested Format)

Topic: ____________________________

Title: ____________________________

Description: ____________________________

Why is it important? ____________________________

Goals: (What do you expect to accomplish?) ____________________________

Action Plan

<table>
<thead>
<tr>
<th>Objectives</th>
<th>How will it be done?</th>
<th>Target Dates</th>
<th>Evidence of Accomplishment</th>
</tr>
</thead>
<tbody>
<tr>
<td>action steps, What will you learn?</td>
<td>strategies, resources needed and where available</td>
<td>When will the activity be completed?</td>
<td>How will you know when the objective has been reached?</td>
</tr>
</tbody>
</table>

Revised by: ____________________________

4-H Leader ____________________________

Parent(s) ____________________________
2. Carry out the plan.

The time has come to go to work on your project. Remember this motto: "Plan your work then work your plan." Use your action plan to guide your progress. Changes may be necessary once you get involved with your project. Your parents and leader will be glad to help you with unexpected problems and can offer suggestions.

Keep a record of progress toward your goal. The record can be in any form that serves the purpose of documenting your progress. A simple journal or diary of project activities is a good habit to establish in a self-study project.

EXAMPLE:

Self-Study Project Journal

<table>
<thead>
<tr>
<th>Date</th>
<th>Activity</th>
<th>Accomplishments</th>
<th>Notations</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>What was done</td>
<td>Include what was learned and problems encountered</td>
<td>Items for future reference or follow-up</td>
</tr>
</tbody>
</table>

Other types of records may be appropriate if you are collecting data about a disease or health problem, recording costs, treatments, or a record of related activity. Design a record format that is organized and useful.

At this stage of the project it is important to be flexible to accommodate problems that arise. Before making changes, give careful consideration to the effect on the outcome of the project. It may be better to extend the time devoted to the project than to omit an important step. Consult with your project leader regularly as the project progresses.

3. Sharing the project.

If the project is worthwhile to you, it is of interest to others. There are many opportunities to share ideas with others, however, it will require initiative on your part to take advantage of them. Consider the following, for example:

- An exhibit about your project at the county fair or in a public area such as store window, shopping mall, veterinarian's office, school, etc.
- A demonstration or speech developed around your project. Many groups appreciate having educational programs on current topics. Enter a contest if appropriate.
- A written report in the form of a news article, a publication, or promotional flyer.
- Radio and television offer further opportunities.

Whatever method is used to publicize the information about your project emphasize the goals, objectives, and results.

A word of caution. When presenting information to your friends or the general public you have a responsibility to be accurate and complete. This is "being accountable" for what is said. It is advisable to review technical veterinary information and recommendations with a veterinarian who is familiar with your topic. If there is doubt about the information, don't say it.

4. Evaluation.

The evaluation is of the most benefit to you, the "self learner." It is not a matter of success or failure but a realistic assessment of what was accomplished and the reason why some things worked and others did not. Review these areas with your 4-H leader or other advisors.

- To what extent did you reach your goals?
- What changes were made from the project plan and what affect did they have on the outcome?
- What were the strengths or good things about the project?
- What would you do differently if you were to do the project again?
- Where do you go from here?
- Are there related topics to study?
- Is there action based upon the project that should be carried out?
- Can you give leadership or assistance to further action that will improve animal health on your farm/ranch/home or in your community?

Are you ready to begin another veterinary science self-study project?
The surroundings of every living organism are its environment, a combination of all the external conditions and influences affecting the life and development of a particular organism. The environment in which we live consists of the air, land, water, and many species of plants and animals. The environments in which families, animals, and organism populations live is called an ecosystem. Because no organism can exist alone in an environment, all plants and animals occupying an ecosystem interact with each other. This action can influence animal health, both favorably or unfavorably depending upon the type and quality of that environment and the animal species involved.

There are many man-made environmental influences on animals (companion and livestock) that have greatly improved animal health, comfort, and production. On the other hand, there are situations that occur due to poor management or planning that expose animals to conditions so bad that serious health problems arise.

The environment, for example, of the dairy cow involves proper feeding, housing, hygiene at milking, proper milking machine function, and many other factors that can affect her health. Some dairymen are able to do an excellent job of managing the dairy cow’s entire environment, while others fail.

A similar environmental relationship to health can be shown to exist with humans and their companion animals.

For this self-study course there are many options from which you can select. For example, animal housing, or animal feeding and their relationship to disease could provide many interesting conclusions. Details in literature of disease causes due to poor feeding or building ventilation are abundant.

The veterinarians’ role in environmental problems related to animal health is very important. They must recognize potential problems, recommend correction to prevent the disease, so there will be fewer sick animals, and treatments therefore, would be minimal.

What are current problems related to the environment?

There are many diseases that occur due to environmental influence. Better methods to identify and control disease problems are always needed. Selection of this topic can pinpoint some of the diseases that need extra effort for control measures.

What can be done to improve the situation?

Increased knowledge of disease, its spread and control, can help improve animal health and thus improve the human relationship.

What needs to be done at the local level?

Publicity about methods of disease prevention should be frequently used. Publicity may be obtained from veterinarians, university extension personnel, and USDA news releases. Publicity aimed at prevention rather than just treatments is most desirable.

Who is working to improve animal health status?

In addition to practicing veterinarians there are professionals in research, teaching, diagnostic laboratories, and regulatory agencies trying to improve the total animal health status.
There is extensive use of animals as a food source and there are large numbers of companion animals in our society. It is necessary to maintain the health of these animals at a high level to protect human health, and to ensure quality food products for human consumption.

Public health problems, at the national level, are under the control of the United States Department of Health and Human Services and the USDA's Food Safety and Inspection Service. A variety of departments exist within these organizations. At the state level are Departments of Public Health that provide a vast complex of public health services to a state's residents. Counties and cities also may have a Public Health Department or Board of Health. The milk and water you drink, the restaurant you eat in, the treatment of your community's sewage and garbage, and all other health measures in your area are supervised by state and local people.

Major objectives of public health activities include maintaining a high level of health in our population. By monitoring potential sources of contaminants or conditions that cause disease, health officials are able to provide guidelines that can minimize these dangers. There are hundreds of potential hazards such as toxic chemicals in polluted air or water supplies. Additionally, there are animal disease organisms, and other contaminants, such as sprays, or residues that may remain in animal products for human consumption, that are monitored to ensure wholesomeness.

Through the centuries, as humans have domesticated more and more species of animals, the interdependence between humans and animals has increased. This interdependence has resulted in closer contact between humans and animals and hence, an exchange of diseases from each to the other. Diseases such as these are called zoonoses. Zoonoses are those diseases whose causative agents can be transmitted naturally between humans and animals.

There are more than 100 zoonoses recognized throughout the world. A few of the most familiar are rabies, brucellosis, tuberculosis, leptospirosis, toxoplasmosis, salmonellosis, and trichophytosis or ringworm. The speed of travel of humans and animals in our modern transportation system greatly increases the possibility of transmission of these diseases from one geographic area to another.

Therefore, it is important that humans maintain the safeguards of quarantine, health certificates, and inspection which have been established to inhibit the
spread of animal disease. Since there has been better control of bovine brucellosis and tuberculosis in the United States, there has been a marked decrease in the number of humans infected with these diseases.

Zoonoses may originate from any of many sources, as you have already learned in 4-H Veterinary Science, Unit II. For example, the causative agents may be viral, bacterial, parasitic, or others. Through many years of research, we now know many of the causes of death and incidence of disease. With current scientific knowledge, we are more aware of the effect of insects, rodents, air and water pollution, immunization and nutrition upon our own and animal health. This knowledge has contributed to our methods of food inspection, mosquito control, immunization against contagious diseases and many other programs.

Milk and food sanitation is an example of the work being done in the many phases of public health. Although milk is called the nearly perfect food, raw milk can be dangerous. Diseases such as typhoid, tuberculosis and brucellosis, can be spread by milk that has been produced by diseased cows or handled by infected persons. Milk suppliers, therefore, insist that milk should come from healthy, inspected cows, be handled in a sanitary environment, and be properly cooled and pasteurized. These measures make the milk you drink safe and wholesome. Food sanitation and proper refrigeration is another area carefully watched by public health workers. Food poisoning may develop from poorly stored food.

Greater effort is now being exerted by public health officials to be sure that no chemicals, pesticides, herbicides, or antibiotics are found in consumer foods. All animals slaughtered for human consumption are inspected by veterinarians or their assistants before and after slaughter. If any meat showing evidence of disease is found, the carcass is destroyed. This guarantees that the meat you eat is safe and wholesome.

There are numerous facets of public health, many of which are related to animal health. Many veterinarians are employed by the public health services and frequently are in administrative roles due to their vast knowledge of animal health as it relates to human health.

What are current problems relative to public health?
There are many diseases transmissible from animals to humans. Better methods to identify and control disease problems are always needed. Selection of this topic can pinpoint some of the diseases that need extra effort for control measures.

What can be done to improve the situation?
Increased knowledge of disease, its spread and control can help improve animal health and thus improve the human relationship.

What needs to be done at the local level?
Publicity about methods of disease prevention should frequently be used. Publicity may be obtained from veterinarians, university extension personnel, and USDA news releases. Publicity aimed at prevention rather than just treatment are most desirable.

Who is working to improve animal health status?
In addition to practicing veterinarians there are professionals in research, teaching, diagnostic laboratories, and regulatory agencies trying to improve the total animal health status.
Animal Health As Related To The Animal's Nutrition

The importance of animal nutrition cannot be overemphasized as it relates to animal production, health, and disease. Nutrition is defined as a function of living plants and animals that consists of the taking in, digestion, and assimilation (use) of material so that tissue is built up and energy is released. Proper nutrition means more than just feeding. Nutritional requirements vary between animals due to many factors, including much more than quality and quantity of food.

The importance of having the proper food beginning from the birth of the animal is essential. Animals, like people, at one level of nutrition may get thin, may stay the same, or may gain weight. For an animal to remain at a constant weight, it must be fed what is called a maintenance requirement. Alert animal owners recognize the individual animal variation and will adjust to its needs. With this as a base, further nutritional requirements are needed for growth, pregnancy, lactation, and activity. This demonstrates that feeding animals adequately is not left to guesswork.

Nutrition does have an important bearing on animal health and disease. The immune system is the ultimate factor in protection against disease. Poor nutrition can cause deficiency disorders that can impair the efficiency of the immune system.

Further, a broad topic selection possibility exists because there are many nutrients such as essential minerals or vitamins that may prevent or cause health problems if deficient or in excess.

Thus, you can see that this third suggestion "Animal Health as Related to Nutrition" could provide as many as 50 or more different topics. Topic selection may be only a single mineral that could be of great interest. However, you could select nutrients such as carbohydrates or proteins to investigate their sources, and requirements under certain living and/or weather conditions.

Selection of topics in this area can stimulate interest that may open the door for career possibilities. Animal and human nutritionists are needed and a career in a field such as this could provide great satisfaction. In addition, you would gain personal knowledge of the importance and necessity of proper feeding management of your own animals to maintain their health.

How does animal health and nutrition relate in our work?

Direct relationship of the above suggestions to actual field cases are real and much more work is needed. To totally understand the nutritional impact on animal health is a large task. Ultimately, better animal nutrition can result in greater quantity and quality of the animal food supply and healthier companion animals.

What are current problems?

There are many disorders that are related to malnutrition. There is need for continued improvement.

What can be done to improve the situation?

More research is necessary to better understand and implement better feeding techniques to provide for more feed efficiency and to determine nutritional errors as causes of disease problems.

What needs to be done at the local level?

In some cases where nutritional disorders are present, effective, well-organized educational programs may help. For example, in severe cold weather, livestock producers or pet owners should heed warnings from animal nutritionists that more energy feeds are required if their animals are exposed to cold for prolonged periods of time.

Who is working to improve the animal health/nutrition status?

In addition to practicing veterinarians there are professionals in research, teaching, and some diagnostic laboratories trying to improve the total animal health status as it relates to nutrition.
All through Units I and II of the 4-H Veterinary Science project the word, management, has been emphasized over and over again. The reason for this is to impress upon you the importance of making decisions to provide a favorable environment for pets or livestock in your care. They deserve to thrive and enjoy their lives; and if proper environment is provided, their health can be more easily maintained. Management decisions include provision for proper shelter, food, and health items such as preventive vaccinations and methods to help in curing disease.

Animals normally are able to maintain health or avoid disease by a very complex protective or immune system. The study of this animal mechanism is called immunology. Immunology is the study of the ways in which living tissues react to foreign living or non-living biological substances. The result of this reaction is called immunity. Many may think of immunity as something that means complete protection against disease. Actually, it is preferable to think of immunity as a condition of increased resistance, ranging from very slight to complete. These are primarily dependent upon two factors: the state of health of the animal (host) and the infective character of the disease agent (organism).

Ironically, the immune system sometimes is responsible for causing certain types of disease. These are called immune-mediated diseases and include disorders such as allergies in humans and animals.

Health, the goal of both veterinarians and physicians, may be defined as that state of an animal in which all of its vital processes—blood circulation, respiration, digestion, locomotion, and all other life activities—are functioning together in harmony. Almost anything, therefore, that disrupts the balance of these functions may be called disease. Infection refers to the ability of a living agent (virus or bacteria) to disrupt or interfere with normal body functions, or, more simply, to produce disease. Infection also refers to the changes that result from the entrance, growth and ill effects of these biological agents on or in the animal body. Some of these agents have been discussed in Unit II and include bacteria, viruses, protozoa, and fungi. They may reach the body in many ways: in contaminated feed or water, through contact with other sick animals, by means of contaminated air, or through wounds.

To effectively study the immune system, it is necessary to have intensive training in advanced college level courses. However, some basic concepts can be
learned from library textbooks in biology and physiology and by visiting with veterinarians who are willing to help you learn.

The ability of the animal to recover from disease can be helped by medical treatments; but for the animal to remain resistant to disease, the immune system is the key. Without this type of protection, the same disease or any pathogen could re-infect at any time. Therefore, specific treatments are generally administered to reduce the effects of infection, thus allowing time for the immune mechanism to build solid protection.

When protection from disease is not complete, a chronic condition may exist that neither kills the animal nor allows it to recover.

The study of immunology is interesting but so complex that a self-study selection of this subject would require a long time. To learn the basic concepts would take reasonable time, but in-depth investigation of immunology could take years.

**How does animal health relate in our world?**

Direct relationship of the above studies to field cases are also real and much work also needs to be done. To totally understand the immune mechanism function could ultimately lead to greater quantity and quality of the nation's animal food supply and healthier companion animals.

**What are current problems?**

There are many diseases that are not preventable at the present time.

**What can be done to improve animal health problems?**

More research is necessary to understand more fully the interaction between the immune system and the causative agents of disease (etiology).

**What needs to be done at the local level?**

In the case of some diseases where vaccines are effective, a well-organized vaccination program will help minimize disease dangers. An example is pet vaccinations for rabies. In livestock production, vaccinations and treatment programs are helpful, but much better prevention can be accomplished as newer and better developments are started and used.

**Who is working to improve the animal health status?**

In addition to practicing veterinarians, there are professionals in research, teaching, diagnostic laboratories, and regulatory agencies trying to improve the total animal health status.

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**Some bacterial forms:** 1) diplococci, 2) streptococci, 3) staphylococci, 4) bacilli, 5) fusiform bacilli, 6) vibrios, 7) carcinae.

**Relative Sizes and Shapes of Some of the Viruses**

**DNA Viruses**

- Poxvirus
- Papovavirus
- Herpesvirus

**RNA Viruses**

- Reovirus
- Coronaviruses
- Rhabdovirus

*Bacteria and viruses are examples of antigens that stimulate the immune response.*
A project for self-study that may be appealing might include an actual study of a specific disease that occurs frequently. A disease that is common to the farm area may include respiratory problems (pneumonia) in cattle or swine, or strangles (distemper) in horses. In the pet or companion animal group, canine distemper or hepatitis in dogs or feline distemper in cats would provide information that may interest you. At the end of this section is a list of diseases common to a species from which you may select.

The previous suggestions are common diseases. However, if you have a disease in mind that you have recently encountered with your pets or livestock, it could be of great interest.

Some diseases have single, specific causes which make the study of those diseases simpler. However, in the disease called mastitis there are so many different causes that you could spend months or years learning most of the complexities. If you choose bovine mastitis as a subject for self-study, select the types of mastitis that are most common, and are specifically caused by one of four organisms, although there can be several methods of spread of this disease.

When you have selected the specific disease, the following criteria are recommended as a proper sequence of study.

**Name of the Disease and Synonyms**
For example equine encephalomyelitis (sleeping sickness).

**Incidence**
The amount or extent of occurrence of the disease.

**Etiology**
Specifically, the causes of the disease.

**Clinical Signs**
Any abnormality common to the disease that is found by the veterinarian or physician.

**Gross Lesions**
A lesion is a more or less circumscribed pathological change in tissue; a wound, or injury showing damage to tissue. Gross lesions are those large enough to see with the naked eye.

**Microscopic Lesions**
These are lesions so small a microscope is necessary to see them.

**Pathogenesis**
The mode of origin and development of a disease; for example: the rabies virus infects a mammal from a
bite of an infected animal through the saliva. The virus then multiplies and ascends to the brain along nerve trunks.

**Diagnostic Methods**
- The methods used to definitively determine the nature of a disease.

**Differential Diagnosis**
- The determination of which of two or more diseases, with similar signs and/or symptoms, is the one from which the patient is suffering.

**Prevention**
- The means and methods of preventing the threatened onset of disease.

**Treatment**
- The medical or surgical care of a patient: the start of measures or giving remedies intended to cure a disease.
- You are now aware what the study of disease entails, and it can be very educational.
- The following is a list of species and some common diseases from which you may select. You are not, however, required to select from this list.

**Dogs**
- Canine distemper
- Canine infectious hepatitis
- Canine heartworm infection
- Canine parvoviral infection

**Cats**
- Feline distemper
- Feline calicivirus infection
- Feline pneumonitis

**Swine**
- Erysipelas
- Transmissible gastroenteritis
- Swine dysentery

**Sheep**
- Scabies
- Enterotoxemia
- Ovine vibriosis

**Cattle**
- Respiratory disease
- Blackleg
- Leptospirosis
- Brucellosis

**Horses**
- Equine distemper
- Equine encephalomyelitis
- Tetanus
- Other home veterinary medical topics may include such things as emergency procedures that should be started before the veterinarian arrives. There are specific things that can be done that you can investigate. These include:

**Respiratory Distress**
- When an animal has difficulty in breathing, it is said to be in respiratory distress. Since the animal would die if it didn't get enough oxygen, this problem must be corrected immediately. Causes can be many and varied.

**Cardiac Arrest**
- Cardiac arrest means that the animal's heart has stopped beating and pumping. If it is not restarted soon, permanent brain and other damage may occur. There are several causes of cardiac arrest.

**Severe Bleeding**
- Bleeding that persists longer than a few minutes should be stopped immediately before blood loss is great. Various procedures to help in this situation should be well known.

**Shock**
- Shock is a failure of the circulatory system to provide blood that contains enough oxygen, nutrients, and toxin (waste) free components to the body tissues. Every seriously injured animal should be treated to prevent shock.

**Poisoning**
- Poisons are substances which chemically disturb normal tissue activities and produce disease. You should be aware of what these are to protect your animal. If poisoning occurs, first aid steps are extremely important.

**Burns**
- Burns can be minor or severe. Minor burns can be treated at home, while severe burns require veterinary attention since they are life-threatening. Prompt action can prevent serious problems such as shock or death.

**Heatstroke**
- Heatstroke refers to the animal's inability to eliminate excess body heat. If body temperature rises far above normal for prolonged periods of time, damage can occur.

**Cold Exposure**
- Exposure to very cold temperatures can result in the freezing of external body tissues. This is commonly called frostbite. The lowering of body temperature is called hypothermia and can be dangerous to the life of the animal if not corrected.

**Electrocution**
- Electrical shock disrupts body function and is not only uncomfortable to the animal, but can also kill it.

**Convulsions**
- Convulsions are violent, uncontrolled muscle movements. They may last from a few seconds to several minutes or longer and can create life threatening effects if not handled properly.

With the options in the fifth suggestion there are many interesting veterinary medical areas to pursue. You choose, plan, and learn from decisions that you make. Make personal observations.

Refer to the first portion of the instructions in 4-H Veterinary Science, Unit III, "Recommended Procedures for Self-Study Projects" and stick to these guidelines for the best results.
A career in veterinary medicine can be broad and diversified. This may be in contrast to the perceived image of the veterinarian who has established a practice in some community or city.

The work of some veterinarians goes far beyond the animal itself. Veterinary science has many branches because animal health has a great influence on human health, comfort, recreation, and livestock value.

The field of veterinary science includes the protection of the world’s food supply by improving animal health and producing better breeding stock. In areas where disease, insects, and parasites are a hazard to human health, veterinarians study the problem to keep both humans and animals healthy.

Veterinarians are animal doctors, but veterinary science branches into many areas. Human needs, comforts, and recreation, as well as animal health, are all a part of veterinary science. Veterinarians sometimes work on unusual jobs, although most of us may assume their primary job is just medical care for pets or farm animals. Some veterinarians specialize in only pet or large animal practices, or some work for industry helping develop animal and human vaccines that prevent disease. Educational institutions also employ veterinarians and technicians to teach students. They frequently work in research to determine the causes, control, and treatment of disease.

Other areas of this profession include public health work in maintaining a wholesome human food supply. Food quality is often inspected by a veterinarian. There are also veterinarians employed by zoos to maintain the well-being of all types of wild animals.

Both men and women are strongly involved in the veterinary medical field. Veterinary technicians attend school for two years, but to become a veterinarian it takes at least seven years of college and sometimes as long as ten to twelve years in some specialized areas.

To thoroughly understand the potential career possibilities in veterinary science, you should specifically select and investigate your field of interest.

For example, if you selected veterinary research, different resource personnel and material would be needed than if you selected public health veterinary work. However, all areas can be interesting and very involved, with extensive study needed to reach reasonable goals.

This final suggestion could have a distinct bearing on your life and future direction concerning a career in veterinary medicine.

Many resources and references are listed in the following section.

Remember, refer to the first portion of instruction in 4-H Veterinary Science, Unit III, “Recommended Procedures for Self-Study Projects” and stick to these guidelines for the best results.
Now that you have completed at least one option in 4-H Veterinary Science, Unit III you should be more aware of the broad scope of veterinary medicine. If you continue to be interested in this area select more self-study topics to increase your familiarity with the subject. An intense interest and success in understanding the complexities of veterinary medicine may indicate that you have a strong aptitude for sciences of this nature. If this proves to be true in your situation, start to prepare now for many years of study, because careers in the veterinary field offer great rewards — but are difficult to attain. Set your goals, and do not allow obstacles or distractions to prevent you from reaching these goals.

4-H VETERINARY SCIENCE UNIT III

Book Reference List

"Today's Veterinarian" 24-page brochure published by the American Veterinary Medical Association

free copies available from:

American Veterinary Medical Association
Public Information Division
600 South Michigan Avenue
Chicago, Illinois 60605
(312) 922-7930

When ordering, please indicate the intended use of the brochures.


GENERAL ANIMAL HEALTH


**PARASITOLOGY**


**BACTERIA AND VIRUSES**


**REPRODUCTION AND LACTATION**


**OTHER**


Many of these books can be purchased and may not be available in the public library. You may be able to borrow some of them from your local veterinarian, and/or your Extension agent, or possibly from University libraries.
Other References and Sources of Reference Material

From local Cooperative Extension Offices - Every state has a large selection of booklets, leaflets, mimeographs, etc. on domestic animal and poultry management and diseases. Many of these publications are free of charge and are well-illustrated and easy-to-read. Four-H manuals used in other livestock and poultry projects may be helpful.

From the U.S. Department of Agriculture - "List of Available Publications #11" contains a complete listing of all publications by the Department. This can be found in Extension offices or it can be purchased from the Supt. of Documents, Government Printing Office, Washington, D.C. 20025.


Animal Diseases, U.S.D.A. Yearbook
"Career Opportunities for Veterinarians in the Agricultural Research Service" Misc. Publ. No. 727, 16 pages
"Scientific Careers in the Agricultural Research Service" - Misc. Publ. No. 798, 37 pages

Pamphlets and Booklets

Client Information Leaflets - Manufacturers of veterinary drugs, biologics, and supplies produce short, well-illustrated leaflets for distribution by veterinarians in their offices or hospitals. These may have a subtle sales message, but they contain up-to-date information and they are free.

Feed Company Booklets - All the major feed companies and pet food manufacturers publish good literature on the feeding and care of animals. Many of these publications have excellent sections on health and diseases.

"Careers - Veterinary Medicine as a Career - Research No. 71." Institute for Research, 537 South Dearborn Street, Chicago, Illinois 60605. 24 pages.
"Opportunities in Veterinary Medicine No. 24." Diamond Laboratories, Thomas U. Kelsay, Director of Advertising, 2538 E. 43rd Street, Des Moines, Iowa.
"Veterinarian" Research Publishing Co., Inc., P.O. Box 245 Boston, Massachusetts 01401. 32 pages.
"Good Health for Your Dog; First Aid for Your Dog; My Dog's Health Record." Carnation Co., 5045 Wilshire Blvd., Los Angeles, California 90036.

From Colleges of Veterinary Medicine: Colleges of Veterinary Medicine publish catalogs of requirements for admission which are helpful for those interested in going to veterinary school. It is important that prospective veterinary students take the prescribed high school and college courses to prepare themselves for admission. Veterinary colleges publish annual reports of their activities and services which are full of useful information.
Books


**Films**

*From your Cooperative Extension Office:* Each state has some films on animal and poultry management and diseases which are produced by the Colleges of Agriculture, or Schools of Veterinary Medicine, the state Department of Agriculture, and industrial firms. Each state Extension Service serves as a film lending library branch for U.S. Department of Agriculture films. A publication "Films of the U.S. Department of Agriculture," is available in your Extension office or from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20025. It lists and describes each of the films.

**Movies, Film Strips, and Slide Film Sets**

Available at no cost or at nominal cost from companies which manufacture drugs, biologics, or veterinary supplies:

**Examples**

**Becton, Dickinson & Co., Film Library, Rutherford, New Jersey 07070**

"A Career in Bacteriology" (20 minutes)

"B-D Controls - The Conscience of a Company" (10 minutes)

**Commercial Solvents Corp., Film Library, Terre Haute, Indiana 47808**

"Monsters from Inner Space" (about the digestive system in ruminants)

**Dow Chemical Company, Film Library, Midland, Michigan 48640**

"Just Pour It On" (Film Strip) #131-102
Gaines Dog Research Center, 250 Park Avenue, New York, New York 10017
“Friend of a Friend” (work of the veterinarian)

Lederle Laboratories, American Cyanamid Co., Film Library, Pearl River, New York 10965
No. V 9 - “Intestinal Diseases in Poultry” - 9 minutes
No. V10 - “Respiratory Diseases in Poultry” - 14 minutes
No. V11 - “Tom Turkey, All American” (Turkey Diseases) - 12 minutes
No. C 1 - “Rabies Can Be Controlled” - 20 minutes
No. C 3 - “The Smallest Foe” (viruses and rickettsial disease research) - 20 minutes

Merck and Company, Film Library, Rahway, New Jersey 07065
“Where It Counts” (about parasites in cattle)
“Saddle Up” (about horse care)
“The Shapes and Sounds of Profits” (about poultry disease prevention)
“Thought for Food” (about the poultry industry)
“Winning the Worm War” (the gastrointestinal roundworm problems in sheep)
“To Drench a Sheep” (describes proper method of drenching sheep)

Norden Laboratories, Film Library, Lincoln, Nebraska 68501
“Life in Your Hands” (lay version of External Cardiac Massage)

Parke, Davis and Co., Film Library, P.O. Box 118, Detroit, Michigan 48232
“Better Medicines for a Better World”
“Front Line” - describes production of tissue culture virus vaccines

Upjohn Company - order from Sterling Movies, USA, Inc., 43 W. 61st Street, New York, New York 10023
“Parasites in Horses”
“With Care and Concern” - describes steps in development and release of new drugs

Cooper USA, Inc., Film Library, 1909 N. Clifton Ave., Chicago, Illinois 60614
“Tick Control” - tick control in foreign countries by high-volume, low-pressure, walk-through unit

16 mm Film List
These films are available from the American Veterinary Medical Association. They can be rented free of charge by a veterinarian.

Contact: American Veterinary Medical Association
Film Library
930 N. Meacham Road
Schaumburg, Illinois 60172

“The Covenant” - An excellent film about careers in Veterinary Medicine, made in 1972. 16 mm. sound and color, 20 minutes.

“A Degree of Importance” - A sound-color motion picture produced by the students of the University of California, College of Veterinary Medicine. An excellent description of student life in a modern veterinary college.

“The Gentle Doctor” - Produced by the Gaines Dog Research Center. 16mm , sound, black and white, 20 minutes. Produced to commemorate the 100th anniversary of AVMA (1963). The film traces the early development of veterinary medicine and the first century of its organization.

“Today’s Veterinarian”
22 minutes, color, 1981

“A Day In the Life of a Large Animal Practitioner” (#186)
27 minutes, color, 1977

“The Small Animal Practitioner” (#199)
18 minutes, color

“The Zoo Veterinarian”
23 minutes, color
"Planned Pethood"
5 minutes, color

"Animals Can Bite" (#178)
13 minutes, color

"Tomorrow's Veterinarian" (#213)
20 minutes, color, veterinary education

These films are available from Michigan State University. The rental fees vary.

Contact: Instructional Media Center
Marketing Division
Michigan State University
East Lansing, Michigan 48824
(517) 353-9229

"The Animals are Crying" - humane treatment of animals
28 minutes, color, 1971

"Behavior of the Dog: Whelping" - labor and birth of puppies, silent

"The Newborn Calf" - birth and early development
11 minutes, color, 1970

These films are available from Purdue University for a rental fee.

Contact: Purdue University
Audio Visual Center Scheduling Office
Stewart Center
West Lafayette, Indiana 47907
(317) 494-2770

"The Rumen Story" - anatomy and physiology of ruminant digestion
28 minutes, color

"How to Spot Health Problems by Observation" - spotting health problems in horses
20 minutes, color, 1973

"Radiation Effects on Farm Animals"
13 minutes, color, 1964

"Remarkable Ruminants" - ruminant digestion
24 minutes, color, 1974

"Parasitic Diseases" - internal and external parasites of horses
30 minutes, black and white

Other Films:

"Small Laboratory Animals and Their Care"
29 minutes, black and white, 1971, rental fee
American Association for Laboratory Animal Science
2316 W. Jefferson Street, Suite 208
Joliet, Illinois 60435

The entire list of publications and other resource material and references were compiled by: Mary Gessert and Kate Steiner and reviewed by Norman D. Long, Extension Specialist, Purdue University and Kenneth B. Meyer, DVM, Extension Specialist, Purdue University.