OVERVIEW

INSTRUCTOR:

UNIT: Identification of Animal Pests and Diseases

LESSON: Causes, Symptoms, Prevention, And Treatment of Various Animal Diseases

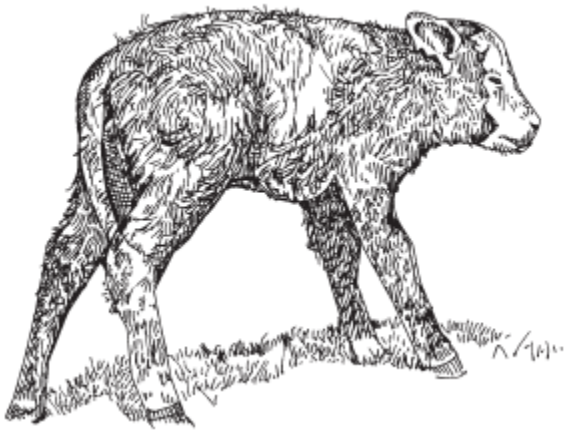
IMS REFERENCE: #8822-B

TOPIC NOTES

CAUSES, SYMPTOMS, PREVENTION, AND TREATMENT OF VARIOUS ANIMAL DISEASES

INTRODUCTION

It is impossible to accurately estimate all the losses caused by livestock diseases, but the United States Department of Agriculture estimates that losses caused by mortality, reduced productivity, lower fertility, condemned products, and restricted access to potential markets exceed 17.5 billion dollars annually in the United States. Those losses represent almost 17% of the production costs associated with the livestock industry. Livestock production is an integral part of the way-of-life for the people of the world. Many farmers and ranchers depend upon livestock production for their livelihoods. Consumers expect adequate supplies of meat at economical prices. With livestock mismanagement and spread of diseases, we are all affected.



CAUSES OF DISEASES

Disease causes body functions to disfunction or function improperly. Three principal reasons most often cited for the spread of diseases are poor sanitation, improper management, and introduction of new animals into a herd.

One or more of the following defects cause diseases.

Nutritional defects - An imbalance of required food nutrients in the ration is the cause of nutritional defects. Animals receiving inadequate amounts of vitamins, minerals, fats,

carbohydrates, and protein cannot produce efficiently. Therefore, their levels of resistance to disease are lowered.

Physiological defects - These defects cause an improper functioning of glands, organs, or body systems. The relationship between the diet and the proper functioning of body parts is directly related. For example, the thyroid gland regulates the rate of body metabolism and depends upon an adequate supply of iodine to function properly. An improperly functioning thyroid gland may increase the nutritive requirements of animals to the point that very few nutrients are available for growth or production.

Morphological defects (physical defects) - An accident or negligence is responsible for physical defects. Cuts, scrapes, scratches, bruises, and broken bones are examples of morphological defects. Any one of these can temporarily or permanently reduce the efficiency of an animal. Good management practices help eliminate defects of this nature.

Pathogenic defects - Certain organisms produce toxins or poisons that upset the normal metabolic activity of the animal. Viruses and bacteria are the most common disease-causing pathogens. They are microscopic in size and capable of multiplying rapidly under ideal environmental conditions. Other pathogens are fungi and protozoans. A discussion of each type follows. Viral diseases are the most difficult to control because viruses closely resemble the chemical compounds that make up a cell. Another problem in controlling viruses is that the chemicals capable of killing or controlling them also kill or destroy the host cell. Preventive vaccinations are the most successful method of controlling viral diseases. Bacteria are microscopic in size, produce powerful toxins, and multiply rapidly. Many bacteria are capable of forming spores, resistant forms of bacterial cells able to withstand severe environmental conditions.
These spores are difficult to control and may lie dormant for years before being provided with the opportunity to cause disease. Antibiotics are used successfully to control bacteria. Fungal diseases are caused by fungi, which are small organisms. Many disease-producing fungi live in the soil. It is often difficult to determine the cause of fungal diseases, because bacteria cause a secondary infection and are often erroneously identified as fungi.
Protozoa are one celled and the simplest form of animal life. Some protozoa cannot move themselves and must be transported by other means. Some move by making whip-like lashes or vibrating projections. A number of different kinds of protozoa prey upon animals and cause disease.

EIGHT GOOD MANAGEMENT PRACTICES

- Animals to be added to a herd should be isolated 3 to 4 weeks before they are placed with the herd. This includes both new animals and those removed from the herd and exposed to other animals.

- A sound immunization program should be followed.

- Clean, healthful surroundings should be provided.

- Rations must be nutritionally adequate.

- Visitors and new animals should not be allowed in the livestock area.

- Diseases should be accurately and quickly diagnosed.

- A competent veterinarian should be consulted when a health problem arises.

- Livestock should be handled properly. Examples of how to handle animals include the following:

    - Canvas slappers, rather than clubs and whips, should be used.
    - Protruding nails and broken boards should be eliminated.
    - Machinery and equipment should be removed from the lot.
    - Horned cattle should be dehorned.
    - Barns and trucks should be bedded properly.
    - Animals should be loaded slowly and carefully.
    - Partitions should be used to separate different classes of livestock.
    - Livestock should be protected from inclement weather.

CHARACTERISTICS OF COMMON DISEASES

Disease	Cause	Symptoms	Prevention & Control
NUTRITIONAL DEFECTS			
Anemia	All farm animals are susceptible. Iron deficiency prevents the formation of hemoglobin, a red iron-containing pigment in the red blood cells responsible for carrying oxygen to the cells.	Characterized by general weakness and a lack of vigor.	A balanced ration usually prevents the occurrence of anemia.
Bloat	Typically occurs when animals are grazing on highly productive pastures during the wetter part of late spring & summer.	Swollen abdomen on the left side, labored breathing, profuse salivation, groaning, lack of appetite, & stiffness.	Maintain pastures composed of 50% or more grass.
Colic	Improper feeding.	Pain, sweating, & constipation, kicking, & groaning.	Careful feeding.
Enterotoxemia	Bacteria & overeating.	Constipation is an early symptom & sometimes followed by diarrhea.	Bacterin or antitoxin vaccine should be used at the beginning of the feeding period.
Founder	Overeating of grain, or lush, highly improved pasture grasses.	Affected animals experience pain and may have fever as high as 106 degrees F.	Good management & feeding practices prevent the disease.
VIRAL DISEASES			
Cholera	Caused by a filterable virus.	Loss of appetite, high fever, reddish-purplish patchwork of coloration on the affected stomach, breathing difficulty& a wobbly gait.	A preventive vaccine is available. No effective treatment. Producers should use good management.
Equine Encephalomyelitis	Viruses classified as group A & B are transmitted by blood-sucking insects, such as the mosquito.	Fever, impaired vision, irregular gait, muscle spasms, a pendulous lower lip, walking aimlessly.	Control of carrier, use of a vaccine.
Hemorrhagic Septicemia	Caused by a bacterium that seems to multiply rapidly when animals are subject to stress conditions.	Fever, difficultly breathing, a cough, & discharge from the eyes & nose.	Vaccination several days prior to shipping or other periods of stress.
Newcastle	Poultry disease - caused by a virus that is spread by contaminated equipment or mechanical means.	Chicks make circular movements, walk backwards, fall, twist their necks so that their heads are lying on their backs, cough, sneeze, and develop high fever & diarrhea.	Several types of Newcastle vaccines are available, antibiotics are used in treating early stages of the disease.
Warts	A virus causes warts.	Protruding growths on the skin.	No known preventive measures. Most effective means is with a vaccine.

CHARACTERISTICS OF COMMON DISEASES (continued)

BACTERIAL DISEASES			
Pneumonia	Bacteria, fungi, dust, or other foreign matter. The bacterium, *pasturella multiocida*, is often responsible for the disease.	A general dullness, failing appetite, fever & difficulty breathing.	Proper housing, ventilation, sanitation, and antibiotics.
Tetanus	A spore-forming anaerobe bacterium is the cause. The spores may be found in the soil & feces of animals.	Difficulty swallowing, stiff muscles, & muscle spasms.	Immunizing animals with a tetanus toxoid.
Atrophic Rhinitis	Two different bacterium, *Bordetella bronchiospetica* & *Pasturella*, cause atrophic rhinitis.	Affects the nose, making it crooked and wrinkled. Sneezing, nose bleeds, and a tear-stained face occur.	Sanitation and a good health program are important for prevention. Vaccines are available.
Anthrax	A spore-forming bacterium causes the disease.	Fever, swelling in the lower body region, a bloody discharge, staggering, trembling, difficult breathing, & convulsive movements.	An annual vaccination. Manure & contaminated materials should be burned & area disinfected. Insects should be controlled.
Blackleg	(Cattle-Sheep) A spore-forming bacterium that remains in an area permanently. The germ has an incubation period of one to five days & is taken into the body from contaminated soil & water.	Lameness, followed by depression & fever.. The muscles in the hip, shoulder, chest, back, & neck swell.	A preventative vaccine.
Brucellosis	Caused by bacteria. *Brucella abortus* is the bacterium.	The abortion of the immature fetus is the only sign in some animals.	Vaccinating calves with Br. abortus prevent cattle from contacting the disease. Infected cattle must be slaughtered.
Distemper	(Horses) – Contagious. Exposure to cold, wet weather, fatigue, and an infection of the respiratory tract aid in spreading the disease.	Increased respiratory rate, depression, loss of appetite & discharge of pus from the nose are visible symptoms. Infected animals have fever & swollen lymph glands, located under the jaw	Animals with disease should be isolated, provided with rest, protected from the weather, and treated with antibiotics.
Erysipelas	A resistant bacterium capable of living several months in barnyard litter.	Three forms: acute, subacute, & diamond skin form. Acute: constipation, diarrhea, & reddish patches on the skin. Subacute: usually localized in an organ such as heart, bladder, or joints. Sloughing off of the skin is common.	An anti-swine erysipelas serum is available.
Leptospirosis	Caused by a bacterium found in the blood, urine & milk of infected animals.	Causes abortion & sterility. Symptoms are blood-tinged milk & urine.	Susceptible animals should be vaccinated.
Tuberculosis	Three types of tubercle bacilli causing the disease are human, bovine, & avian. The human type rarely produces TB in lower animals, but the bovine type is capable of producing the disease in most warm-blooded vertebrates. The avian type produces the disease in birds & swine.	Lungs are affected. However, other organs may be affected. Some animals show no symptoms; others appear unthrifty & have a cough.	Maintaining a sanitary environment & comfortable quarters help prevent the disease.

CHARACTERISTICS OF COMMON DISEASES (continued)

Pullorum	Poultry disease caused by a bacterium that is capable of living for months in a dormant state in damp, sheltered places. The germs infect the ovary & are transmitted to the chicks through the eggs.	Infected chicks huddle together with their eyes closed, wings drooped, feathers ruffled, & have foamy droppings.	Blood test is required for positive identification of the disease. Disposal of infected hens aids in preventing the disease. Chicks should be purchased from a certified pullorum-free hatchery.
FUNGAL DISEASES			
Foot Rot	A fungus common to filth is responsible for foot rot. Animals are most apt to contact foot rot when forced to live in wet, muddy, unsanitary lots for long periods of time.	Skin near the hoof-line is red, swollen, & often has small lesions.	Maintaining clean, well-drained lots is an easy method of preventing foot rot.
Calf Diphtheria	Lives in soil, litter, & unclean stables& enters the body through small scratches or wounds.	Difficulty breathing, eating, and drinking. Patches of yellowish, dead tissue appear on the edges of the tongue, gums, & throat. Often, a nasal discharge occurs.	The diseased tissue is removed to expose healthy tissue, which is treated by swabbing it with tincture of iodine.
PROTOZOAN DISEASE			
Coccidiosis	A protozoan of which several species is responsible.	Occurs in two forms: cecae and intestinal. Cecae is the acute form that develops rapidly & causes high mortality rate, bloody droppings, & sudden death. Intestinal coccidiosis is chronic in nature, and its symptoms are loss of appetite, weakness, pale comb, & low production. Few deaths occur from the latter form.	Because the disease is transmitted in feces, maintaining sanitary conditions & feeding a coccidiostat prevent the disease.

DISEASE PREVENTION

Prevention is the key to controlling animal diseases. Sanitation is the key to prevention of diseases. Most disease-causing agents enter the body through some type of body opening, such as the nose, eyes, mouth, or wound incision. Pathogens may be spread by direct contact, or indirectly by the wind, water, feed, or other animals. After entering the host, a pathogen must overcome the natural resistance of the body to produce the disease.

The following management practices are possibly the best methods of controlling diseases.

- Provide an environment that prevents or restricts the growth of pathogens (sanitation).
- Provide a balanced diet.
- Provide protection from accidental injury. The practices include the following standards for the animals' living quarters.
- Sufficient space for all animals. Crowded conditions tend to promote the incidence of disease.

- Fresh air and temperature control through ventilation.
- Good drainage. Floors and pens must be kept dry and clean. Bedding must be kept fresh, and manure should be disposed of often.
- Systematic pasture rotation system. This is a practical method of disease and parasite control. It breaks the life cycle of pathogens by removing the host. The ultraviolet rays of sunlight kill pathogens when the pasture does not have livestock in it to reinfest it.
- Use of disinfectants. Chemicals that restrict the growth of pathogens should be used regularly. Soap and boiling water are two inexpensive disinfectants available to livestock producers.

GOVERNMENT REGULATIONS

Governmental regulations controlling the transportation and sale of diseased animals are strict and complex.

It is important that the livestock producer recognize available assistance through the local veterinarian. The services of the local veterinarian should be used in establishing a disease prevention program and as a source of information on governmental regulations affecting the producer.

SUMMARY

Proper management practices are the keys to profitable livestock enterprises. Many variables cause diseases, but consulting local veterinarians and learning about the diseases reduce the incidence of the diseases.

If mismanagement and livestock diseases are allowed to spread, everyone loses.

SELECTED WEB SITES FOR INFORMATION RELATED TO ANIMAL DISEASES

http://www.aphis.usda.gov/vs/nvsl/
http://www.ianr.unl.edu/pubs/animaldisease/
http://www.ohsu.edu/cliniweb/C22/C22.html
http://www.usaha.org/links.html
http://www.usaha.org/NAHEMS/
http://www.usaha.org/reports/reports.html
http://www.vetmed.iastate.edu/academics/international/pages/resources.html

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REFERENCES

Agricultural Research Service – U.S.D.A. "Animal Health." [Online]. Available: http://www.nps.ars.usda.gov/programs/programs.htm?npnumber=103&docid=288. [2002, July].

Baker, James K. and William Greer. *Animal Health - A Layperson's Guide to Disease Control*. Prentice-
Hall, Incorporated: Upper Saddle River, NJ. March 2002.

GLOSSARY OF TERMS

Antibiotic – A chemical substance produced from microorganisms and used to kill other microorganisms.

Diseases – Impairments that affect the performance of vital life functions.

Metabolism – The phenomena of chemically changing feedstuffs into complex tissue elements and complex substances into simple compounds.

Morphological defects – Physical defects caused by accident or negligence.

Nutritional defects – Defects caused by an imbalance of nutrients in a ration.

Pathogenic defects – Defects caused by pathogenic organisms such as bacteria and viruses.

Physiological defects – Defects caused by improper functioning of body parts such as glands and organs.

Slapper – An item used while working cattle or other livestock to ensure that no damage occurs to the animal's hide.

Viruses – Ultra-microscopic particles reproduced in a cell that causes a reaction in the cell.