

available vary considerably.

Control is primarily limited to antibiotic therapy and vaccination. Early diagnosis followed by treatment is effective in limiting the extent of outbreaks.

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Differential Diagnosis, Treatment and Prevention of Diarrhea in Brood Cows and Yearlings

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This presentation should be titled "Diarrhea, a Symptom of Many Diseases."

Diarrhea by definition is an abnormal frequency and liquidity of the feces. I feel that we are all guilty of making the mistake of confusing diseases and symptoms.

The problem of diagnosing diseases characterized by diarrhea in cattle is more complicated than in other classes of animals because the forestomachs add another dimension to consider in determining the reason that a cow or a herd of cattle has diarrhea.

Forestomach diseases as a primary cause of diarrhea will not be considered in great depth today

because the topic has been well covered at previous meetings of the AABP and due to the time allowed today, we will concentrate on diagnostic problems that occur with diseases of the alimentary tract beyond the abomasum. Inflammations of the stomach are called gastritis and many veterinary texts use the term when describing inflammatory conditions of the rumen, reticulum, omasum and abomasum. This paper will use the term gastritis to mean inflammation of the abomasum only.

Enteritis refers to inflammation of the small intestines and dysentery refers to inflammation of the large intestines. The term "dysentery" usually infers

bloody diarrhea along with straining, although some diseases characterized by enteritis will also show bloody diarrhea with straining.

Gastritis, enteritis, and dysentery cause increased gut motility, increased secretion of fluid into the lumen, and reduced absorption. These effects of enteric inflammations explain the concurrent weight loss and decreased resistance to other diseases due to loss of body fluids, poor digestion, and reduced absorption of nutrients.

The animals will show varying amounts of abdominal pain and diarrhea depending on the severity of the condition.

Any symptomatic treatment of diseases characterized by diarrhea will include measures to slow down the increased gut motility, replacement of fluids and substances lost by the increased secretion and reduced absorption. The next step in treatment is correcting the cause of the inflammation and healing the effects of the condition in the digestive tract.

Correcting the cause of the diseases characterized by diarrhea requires a correct diagnosis.

What are the causes of enteric inflammations? 1. Bacteria; 2. Viruses; 3. Protozoa; 4. Chemical Agents; 5. Parasites; 6. Nutritional Substances; and 7. Mechanical Obstructions.

Always keep in mind that regardless of the number of cows or yearlings that are sick in a herd - the herd is not sick. The individual animal is sick and experiencing the effects of the disease and showing signs that will lead to the diagnosis of the disease and the determination of its causative agent.

The clinical examination of cattle showing diarrhea is especially important because of the many causative agents which were just listed. The clinical examination consists of three independent steps, which are: 1. Physical examination of the animal; 2. History taking; and 3. Examination of the environment.

To properly examine the bovine it is necessary that we as individuals continually review bovine anatomy, physiology and bovine diseases to aid us in recognizing changes from normal. Don't neglect doing a complete physical examination as diarrhea is usually only one of the symptoms of the disease being expressed by the animal.

Examination of the history should be complete and needs to include both past happenings to the individual animal and to the herd. There is no best order to follow in taking the history. Each practitioner should develop a style that suits his personality. Regardless of how long we have been in practice it will pay each of us to take a pencil, paper and perhaps a textbook and write down a definite procedure to follow. This will insure completeness, savings in time and better results.

Examination of the environment will include looking at the climate, nutrition, housing, soil type, plants in the pasture, water supply and possible access to toxic substances.

The necropsy is the best tool that we have to aid us

in diagnosing severe diseases. The necropsy allows us to look grossly at all tissue in the animal's body and allows us a means of collecting tissues and specimens for later laboratory study.

Many practitioners submit cattle for necropsy that are not complicated diagnostic problems even though many animals may be dying. In many of these cases the practitioner has necropsied animals but could not determine the cause of death. The reason for failing to find the cause of death is inadequate necropsy procedure. The reason for inadequate necropsies is not a lack of knowledge but haste. Why do we hurry through the post mortem examination of cattle? The answer is, we do not charge enough for this service. Our fees for necropsies should be high enough so we will not feel compelled to take a quick look and get on the road because four calls remain on the book that will pay better.

Often the veterinarian is not able to make a diagnosis based on the findings of the physical examination, history, environmental examination or necropsy findings. When this happens the next procedure is to submit specimens to a diagnostic laboratory.

Results obtained from a diagnostic laboratory are never better than the data, tissue or specimens which they receive to work with. Laboratory fees are expensive and we should stack the cards in our favor when submitting samples so the laboratory can make a diagnosis and the client will realize the full benefit of his expenditure.

Take a few extra minutes when submitting material to the laboratory and write a complete case history, describe the clinical signs and state all post mortem lesions observed. Remember the information submitted with specimens allows the laboratory personnel to select tests which will have the greatest possibility of success in the shortest amount of time.

Collecting Tissue for Submitting to the Laboratory

Many diseases may be diagnosed by histopathology study alone. Tissue that is to be submitted for histopathology must be fresh when taken and well fixed in 10% formalin. The pathologist is looking for changes that occur as a result of disease and will be hampered in his effort to aid you if the tissue changes are altered by post mortem autolysis. The fixative of choice in most cases is 10% buffered formalin. This can be obtained from any chemical company. If this product is not available, 40% formaldehyde may be cut to make a 10% solution by using one part of 40% formaldehyde and nine parts of 0.85% NaCl in water. The 40% formaldehyde is assumed to contain 100% formalin when it is being diluted. Never fix tissue in the 40% solution.

A very sharp knife is necessary when collecting tissue for fixation. A dull knife will damage tissue, causing artifacts. The tissue should be cut in slices between 1/8"-1/4" thick to insure proper fixation. Collect tissue from all organs and systems. The per-

sonnel at the laboratory will decide which to use, depending on the history, symptoms, and lesions reported to them. Many times an organ will show microscopic changes but will not be in the system responsible for the clinical signs. The ratio between tissue and 10% formalin should be 1-20. Make it a habit to always carry a few small jars of 10% formalin with you and you will always have it when needed.

Submission of Specimens for Virus Isolation and Identification¹

1. Specimens should be fresh and collected, if possible, with aseptic precautions and placed in sterile containers.
2. The source and kind of material depends on the disease. The site of the lesion is usually a good area to sample.
3. No preservatives or fixatives should be added.
4. For isolation purposes, the earlier in the acute stage of the disease the specimen is taken, the better.

Viruses are usually present in the highest concentration before the onset of clinical signs. Therefore, take the sample as early as possible in the course of the disease.

Samples from sick animals are preferred rather than samples from animals which have died from the disease.

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Interferon and antibodies may be present in the tissue in later stages of a disease and can interfere with virus isolation procedures.

5. The acutely ill animal will usually have an elevation in temperature. In many viral diseases, a drop in the WBC count will coincide with the rise in temperature. The concentration of virus in the tissue should be highest at this time.
6. Handling of Specimens: Sterile plastic bags for tissue. Swabs in tubes with sterile transport medium.
7. Preservation: Most viruses are heat sensitive. Ship in styrofoam containers filled with crushed ice or dry ice. If dry ice is used, seal the tissue in glass or metal containers so the released CO₂ will not inactivate the virus. The best method of shipment is for the owner to take the specimen to the laboratory. Virus isolation and identification is expensive so make sure the specimen is in good condition when it arrives at the laboratory.

Do not send tissue in 10% formalin and tissue for virus isolation in the same box as freezing will destroy tissue for use in histopathological examination.

8. The standard method of isolation of most bovine viruses is inoculation of bovine kidney cell cultures with the suspected material and incubating the culture until cell damage occurs or until a certain time has elapsed. The virus is usually identified by fluorescent antibody tests of cell culture. Fluorescent antibody test can be run directly on some submitted material without culturing.

Pulmonary Emphysema of Pastured Cattle

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A significant disease problem of cattle characterized by sudden onset of acute respiratory distress shortly following a change in feed or forage has been known for a number of years. The disease syndrome was described as early as 1830 in Europe and there has been numerous subsequent reports from many areas of the world (17). The disease has many synonyms, but is generally referred to as Acute Bovine Pulmonary Emphysema (ABPE) in the Pacific Northwest and western intermountain regions of the United States. In the Midwest it is often designated

as bovine adenomatosis. In other areas of the United States and in several other English-speaking countries it is referred to as a typical interstitial pneumonia of cattle. Local terms that are often used by ranchers and veterinarians include cow asthma, green grass sickness, summer pneumonia, lungers, grunters, panters, and others.

Economic loss to the livestock industry from this disease is extensive. Loss due to death of cattle is considerable, and since the majority of the animals are brood cows, the economic loss substantially exceeds