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Enterotoxemia in Lambs

This NebGuide discusses the causes, clinical signs, diagnosis, treatment, and prevention methods of this potentially fatal disease.

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Enterotoxemia, which is also known as "overeating" or "pulpy kidney" disease, is a highly significant and costly disease problem for the sheep industry. Proper preventive practices are strongly recommended to sheep producers in order to avoid death loss from this disease.

The word "enterotoxemia" can be broken down into three parts that can be an aid in understanding the disease. The term "entero" refers to intestine; "tox" refers to toxin or poison; and "emia" refers to blood. Thus, from "intestinal toxin in the blood" comes the term "enterotoxemia."

Cause

The causative organism of enterotoxemia is the bacterium *Clostridium perfringens*, Types C and D. Under certain conditions, the toxins produced by these bacteria will cause the clinical signs that frequently result in the death of the animal. *Clostridium perfringens* is a normal inhabitant of the intestinal tract of sheep and most mammals. Certain conditions appear to trigger excessive bacterial growth, and thus lethal amounts of toxin are produced. Predisposing conditions often appear to be nutritional and occur most often in the early stages of feeding in feedlot lambs. Excessive concentrate ingestion, generally exceeding 3/4 pound per head per day, is a common history in flocks of affected animals. Other management factors that allow lambs to rapidly engorge, such as irregular feeding or inadequate bunk space, also increase the risk of enterotoxemia. Consumption of large amounts of milk by nursing lambs is also thought to contribute to the occurrence of this disease.

Clinical Signs

Death is most often the first sign observed. The disease progresses very rapidly, with death usually occurring less than two hours after onset of clinical signs.

Affected live animals will often show periodic muscular tremors and convulsions. The animal may rise between seizures, but as the condition progresses, may collapse. Convulsions occur often with the head, neck, back, and limbs rigidly extended. Frothing at the mouth, grinding of the teeth, and oscillations of the eyes may be apparent. Diarrhea may be present in some animals.

Incidence

Geographical prevalence essentially includes all sheep producing areas of the world.

There is variation in the age of the sheep affected. Nursing lambs commonly are affected by *Clostridium perfringens* Type C; this condition usually is related to milk rather than grain consumption. Type D enterotoxemia is commonly encountered in weaned, feedlot lambs. Mortality or death losses in unvaccinated flocks average 5 to 10%, but can range up to 30% or more.

Diagnosis

Enterotoxemia must be differentiated from other acute, fatal diseases of sheep, such as blackleg, bloat, or acute poisonings. Clinical signs of grain overload, or acidosis, are similar to those of enterotoxemia. Grain overload losses occur from overconsumption of concentrate rations whereas enterotoxemia losses, even though often precipitated by eating high concentrate rations, occur from *Clostridium perfringens* toxin production. It is essential to differentiate enterotoxemia from grain overload; however, at times both can occur simultaneously in the same flock.

Tentative diagnosis is determined first by assessing clinical signs. Post mortem examinations are needed to confirm the diagnosis. Type C enterotoxemia primarily shows a discolored, hemorrhagic small intestine. Type D enterotoxemia may or may not show small hemorrhagic spots in the intestines. Fluid around the heart is a frequent finding. The lungs are often congested and fluid filled. Urine is also often found to be high in sugar content. Other conditions may be present, but are found less consistently.

Laboratory confirmation is accomplished through culturing large numbers of the *Clostridium perfringens* organisms. They can be found microscopically in scrapings or tissue of the intestines, and thus are a valuable diagnostic aid.

Treatment

Treatment of affected individual animals is usually ineffective, thus prevention is essential. Antitoxins produced by commercial companies can be given either orally or by injection. Administration of antibiotics such as penicillin may be recommended, but is frequently of little value after clinical signs appear. Other supportive therapy, such as fluids, vitamins, or cortisone, may be prescribed.

Flock treatment primarily involves a ration change that reduces or eliminates concentrate feeding and increases the amount of roughage fed for a period of time. Feeding of concentrates may be gradually increased after dangers of enterotoxemia have passed.

Prevention

Prevention and control of feedlot enterotoxemia (Type D) is best achieved through good management. Properly timed and balanced rations, along with vaccinations, are necessary. The vaccine recommended is Type C and D toxoid, and requires two injections. The first injection should be administered prior to the feeding period, and the booster three weeks later. The booster injection should be given at least two weeks before starting the lambs on a high concentrate ration.

Type C enterotoxemia in nursing lambs is best prevented by vaccinating (also with a two-injection vaccine) the pregnant ewe. Pregnant ewes should receive their second, booster vaccination no later than four weeks prior to lambing. This lamb protection is conveyed through the ewe's colostrum and can provide immunity for up to five weeks. Vaccination of the lambs also, using Type C and D toxoid, may be required to maintain high levels of protection after colostrum immunity has disappeared.

Other management factors can also aid in prevention. A gradual transition of two to three weeks from a roughage to a highly concentrated ration is important. Feeding at regular intervals, proper ration mixing, sorting lambs for uniformity in size, and providing adequate bunk space for the lambs are necessary managerial procedures that help to prevent enterotoxemia.

Summary

Enterotoxemia is a sudden death disease that allows little or no time for treatment. Prevention of this disease is by far the only approach, both practically and economically, under lamb feedlot conditions. It is important to follow preventive vaccination and other good management procedures to minimize losses from this potentially costly disease.

File G794 under: ANIMAL DISEASES

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