



Vet Call

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***Clostridium perfringens* in calves**

Clostridium perfringens type C (C. perfringens type C) is a bacteria normally found in the intestines of all cattle, including calves. This bacteria produces two toxins that can be dangerous, but they are usually broken down in the intestinal tract without causing any problem. However, under the right conditions, the bacterial population can rapidly increase and produce more toxin than a calf is able to detoxify, and the calf often dies as a result.

Management is critical

Death due to *C. perfringens* type C (also called type C enterotoxemia) occurs most commonly in calves less than 10 days of age, but can be found in animals up to 2 months of age. As calves get older, they produce an enzyme in their gut that protects them from the toxin.

Clostridial diseases are not spread from animal to animal. Calves that get sick or die from *C. perfringens* type C are those that have the organism and have one or more risk factors. Management is a critical factor in control of clostridial diseases.

Sudden death is often the first sign that a herd has type C enterotoxemia problems. During an outbreak of *C. perfringens* type C disease, usually only 10% or less of calves in a problem herd are affected; however, death loss in affected calves approaches 100%. The disease can cause death in a matter of a few hours. Affected calves typically show signs of colic — kicking at the abdomen, lying down and occasionally rolling. Some animals will have diarrhea. In animals surviving four to five hours or longer, blood can be present in feces and is usually dark in color. As the disease progresses, calves become depressed,

and nervous signs, including convulsions, muscle rigidity and arching of the back, are common.

Fatal toxins

The two toxins produced by *C. perfringens* type C each result in damage to specific tissues. Alpha toxin causes the breakdown of red blood cells, and beta toxin creates inflammation of the intestine and loss of intestinal lining. The combination of both toxins results in severe intestinal damage and bleeding. If an affected calf is necropsied, the intestines look purple and can have ulcers.

The bacteria that cause the disease are normally found in the intestines of cattle and are known to survive for months in soil. Therefore, all calves are exposed to the bacteria, but disease only occurs when conditions allow the bacteria to multiply very rapidly. The bacteria grow and thrive especially well when the intestines have plenty of sugars and proteins, and when there is little intestinal motility. Milk is high in lactose (a sugar) and casein (a protein), and a large meal will reduce intestinal motility; therefore, calves nursing high-producing dams or nursing cows with especially full udders, such

as occurs after a storm or separation of dam and calf, may be more susceptible.

Ruling out other diseases is important when considering losses due to type C enterotoxemia. Other problems showing similar signs may be mistaken for the disease, so a thorough necropsy done as soon after death as possible and appropriate laboratory tests are critical. Laboratory tests may reveal large numbers of clostridial organisms and indications of intestinal damage consistent with enterotoxemia. Severely decomposed samples will not provide an accurate diagnosis. The most accurate diagnosis requires identification of the toxins. However, this test is not practical in most situations because it is a difficult test, and the toxins are inactivated within hours of death, making them unavailable for testing.

Treatment, prevention

Treatment of affected calves is usually not successful, especially if calves are in advanced stages of the disease. In early stages of disease, calves may respond to a combination of treatments recommended by a veterinarian. Commercial antitoxin products are available and are given by mouth or injected subcutaneously (sub-Q). Antibiotics also are routinely administered by mouth or injection. Intravenous fluids with electrolytes to correct dehydration should be given.

Control of type C enterotoxemia is best approached using a combination of preventive measures. Newborn calves depend upon immunity received from the cow's colostrum for protection against *C. perfringens*-related diseases. Natural immunity and immunity from vaccination are important in the cow herd.

Vaccines, directed toward toxins produced by *C. perfringens*, are available and should be administered to pregnant cows before calving. Generally, two injections are given initially to heifers or cows, with one booster given annually in subsequent years according to vaccine label directions. However, a veterinarian may adjust individual herd vaccination programs due to varying herd conditions and disease incidence.

Other than vaccination, enterotoxemia prevention includes decreasing exposure to the bacteria and controlling conditions that might lend themselves to high risk of the disease. Use of clean calving areas or pastures and limiting the exposure of young calves to older calves are practices that limit exposure to *C. perfringens* and other infections.

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