



Vet Call

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Blackleg and other clostridial diseases

Following every calving season, veterinarians and a few cattlemen are confronted with calf death loss due to blackleg and other clostridial diseases. These diseases are caused by a family of bacteria called *Clostridia*.

An old problem

This group of bacteria is very common in the intestinal tract of cattle and can survive for many years in soil. This family of bacteria can release large amounts of toxins that vary between the specific clostridial organisms. Even though the toxins and the effects they cause vary, all the clostridial diseases that are important to cattle producers can cause death.

Some of the earliest cattle vaccines developed were for this family of bacteria. Different species of clostridial bacteria tend to cause disease in different ages of cattle. The most common clostridial diseases of young calves are blackleg (*Clostridium chauvoei*), clostridial enterotoxemia (*C. perfringens*) and occasionally tetanus (*C. tetani*).

Common diseases

Blackleg. Blackleg is caused by the bacterial organism *C. chauvoei*. This bacterium lives in the soil where it can survive for many years. It is assumed that the bacteria enter cattle through the digestive tract and can be found in many tissues of healthy animals. The disease is created when the bacteria multiply rapidly in muscle and release large quantities of a fatal toxin. Muscle trauma or bruising from handling, trucking or normal animal interactions may be required for the bacteria to have a suitable environment to multiply rapidly, but the exact requirements for disease onset are not known.

Cattle affected by blackleg are very likely to die. The disease is most common in young calves up to 12 months of age, with animals more than 1 to 2 years of age rarely being affected. The disease attacks very rapidly and in many cases a dead calf is the first indication of a problem. If detected early enough, the signs of blackleg disease are depression, lack of interest in eating, reluctance to move because of lameness (muscle soreness), and muscle swelling in the affected area. The most commonly affected muscles are those of the legs, tongue, brisket and udder.

Blackleg (like other clostridial diseases) is not considered a contagious disease; the disease does not pass directly from one calf to another. Rather, it is transferred from soil to an animal. An outbreak may appear contagious in that a number of animals can be affected in a short period of time, usually following a soil disturbance.

Although the blackleg organism is very common in all parts of the U.S. and most likely present on most farms and ranches, some pastures have a much higher risk than others do. Any event that disturbs the soil, such as flooding, pond repair, bulldozer work, laying water pipe, etc., can initiate an outbreak of blackleg disease in pastures with heavy loads of blackleg organisms. Although vaccination is not 100% successful at protecting calves from blackleg disease (especially in young calves), vaccination will decrease the number of calves that are susceptible to the organism.

Enterotoxemia. *C. perfringens* or enterotoxemia is typically a disease of young calves. Most commonly, death following the onset of disease is so rapid that the first sign of a problem is to find a dead calf. Occasionally calves may be found that have diarrhea and abdominal pain, and possibly seizures, but affected calves almost always die. Affected calves are typically suckling cows with high milk production and are often the healthiest, fastest-growing calves.

There are five known types of *C. perfringens* (A, B, C, D and E); type C is the type that seriously affects calves in North America. *C. perfringens* Type C is a normal bacteria of calves' and adult cattle's gut and is present in calf intestines shortly after birth. This organism secretes a toxin that can cause rapid death if present in large amounts. The disease is most frequently observed in calves one week of age or less.

Because the germ normally lives in the gut of healthy calves, two things must happen for the organism to multiply rapidly and produce large amounts of toxin.

First, the bacteria need an abundance of carbohydrates, which are present in milk. Second, the intestinal tract motility must be at least partially slowed, which occurs following a large meal. Following a large milk meal, high levels of toxin can be produced, and death can occur rapidly. An enzyme produced by the pancreas is able to break down the toxin, but this enzyme (trypsin) is present in small amounts the first few days of life. It increases to protective levels by a couple weeks of age.

Tetanus. Tetanus is caused by *C. tetani*, and cattle are not as susceptible as many other species — but deaths due to tetanus are occasionally seen. The organism can enter a wound and produce toxins that cause death.

Many commercially available clostridial blackleg vaccines do not include a component for protection against tetanus. Vaccines for cattle that provide protection against tetanus are available and are commonly used when cattle are castrated with elastic bands, as this method of castration is associated with some tetanus deaths.

Prevention and treatment

Vaccines are available that provide fairly good protection against clostridial disease. Older animals respond best to vaccination by building a protective immune response. Young animals that have been vaccinated may or may not have developed protection, so deaths from blackleg can occur in vaccinated herds. Because the vaccine is fairly effective, a program where calves are initially vaccinated at 2 to 3 months of age with subsequent revaccination is recommended. During an outbreak of enterotoxemia, antitoxins and antibiotics should be administered to calves that do not show signs of disease and that are less than 2 weeks of age.

Treatment of clostridial disease cases is not likely to be rewarding. Treatment with antibiotics and supportive treatment (keeping cattle dry, comfortable and hydrated) have been used with minimal success.

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