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Clostridium chauvoei (Blackleg)

The Clostridium spp. of bacteria are of major concern in livestock as primary causes of disease. The clostridia are all gram positive, anaerobic (don't require oxygen) and all have the ability to produce endospores. The Clostridium spp. are potent producers of exotoxins - which is the primary component of their pathogenicity. For example, the exotoxin from *Clostridium tetani* causes tetanus (lockjaw). The exotoxin in *Clostridium botulinum* causes botulism (flaccid paralysis).

In this month's Vet's. Corner we will be discussing a clostridial that causes a disease syndrome called blackleg: *Clostridium chauvoei*.

Blackleg is usually acute. The disease is infectious and causes severe inflammation of skeletal and cardiac muscle, severe systemic toxicity and, not surprisingly, a high mortality. It is most commonly seen in cattle, but can occasionally be seen in other species. In sheep it's almost always secondary to a skin wound. Other species of clostridial bacteria can cause similar symptoms.

Clostridium septicum and *Clostridium novyi* can cause 'false blackleg' which is more accurately diagnosed as malignant edema. For this reason it is best to use a multivalent vaccine containing antigens of *Clostridium chauvoei*, *Clostridium novyi* and *Clostridium septicum* when protecting cattle against blackleg.

Most cases of blackleg occur in the warm months of the year. Outbreaks can occur following excavation of soil, which can expose and activate latent spores. Also the disease is enzootic in areas with a history of flooding. It is common for a number of animals to be affected within a small time frame. In cattle the disease is mostly confined to animals that are rapidly growing and on a high nutritional plane.

It is assumed that the route of infection in cattle is through the intestinal mucosa following ingestion of the soil borne spores. Blackleg develops when the spores locate in normal skeletal and/or cardiac muscle and then proliferate after localized trauma or anoxia. Toxin is then released resulting in a necrotizing myositis and systemic toxemia.

In cattle observed prior to death, there will be severe lameness and swelling in affected tissues. They will run a high fever, be off feed and be very depressed. In many cases cattle will be found dead in the pasture without any prior symptoms. For this reason, lightning strike is a common rule out.

Post mortem findings in cattle with blackleg include dark, discolored, swollen and rancid muscle upon incision of the affected area. The affected muscle will have excess fluid and bubbles of gas. Body cavities will contain excess fluid and overall decomposition of tissues is rapid. In cardiac myositis there is usually a large accumulation of fluid around the heart with large amounts of fibrin. Quick post mortem examination and submission of samples to the lab by your veterinarian is essential to confirm a diagnosis of blackleg. Carcasses of animals with blackleg infection should be burned or buried deep with quick lime to limit contamination of the soil.

Treatment of cattle suspected of being infected with blackleg results in only average success and only if they are treated early in the course of the disease.

High doses of penicillin are the treatment of choice.



Prevention in the form of routine vaccination with multivalent bacterins containing *Clostridium chauvoei*, *Clostridium septicum* (Colorado Serum Company's Essential 2 and Essential 2+P), and in some cases also *Clostridium novyi* (Colorado Serum's Essential 4) has proven to be very effective. Vaccinating calves at 2 to 3 months old should be followed by a booster at 4 to 6 months of age. In endemic areas with a high incidence of disease vaccinating calves as early as 3 weeks has been recommended, followed by boosters at 2 months and 4 months of age. Annual revaccination of adult cattle in the spring prior to warm weather is also recommended. Killed bacterin is o.k. to give to pregnant animals. In an outbreak all unaffected cattle should be vaccinated immediately and given penicillin for one to two weeks, as it will take about 2 weeks for immunity to develop.