

BLACKLEG AND MALIGNANT EDEMA CONTROL

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Blackleg and malignant edema are caused by bacteria of the genus *Clostridium*. Blackleg is caused by *Clostridium chauvoei* and occurs in cattle, sheep, deer and infrequently in swine.

Malignant edema affects most species of warm-blooded animals and is caused by *C. septicum*, although *C. novyi* produces a similar syndrome.

The clostridia are comparatively large, rod-shaped organisms which will not grow in the presence of oxygen. These organisms form microscopic spores which contain all the essential ingredients of the bacterium and are extremely resistant to heat, drying and disinfectants. Clostridia live normally in soil and in the digestive tract of many animals; they also enter the soil from the carcasses of animals which die of clostridial infection, often surviving there indefinitely. Because of their prevalence and their ability to survive under environmental conditions, clostridia must be considered as an ever-present threat to livestock health.

SPREAD OF THE DISEASE

When animals are infected by clostridia, the organisms usually do not spread throughout the body of the animals, but multiply in a localized area. In blackleg and malignant edema, the bacteria produce potent

toxins which cause tissue destruction in the area of the infection; spread of the toxin through the blood stream often lead to general sickness and death.

Clostridium chauvoei probably enters the animal's body from the digestive tract, passing into the blood stream and settling in various muscles. Under certain conditions such as bruising of muscle, these organisms begin to multiply, producing the disease.

Malignant edema occurs in horses, cattle sheep and swine, and is somewhat comparable to gas gangrene (*C. perfringens* infection) in man. The disease occurs when a wound becomes infected by *C. septicum*.

Malignant edema and blackleg occur most commonly in animals less than two years of age but are not limited to this age group. Both diseases have been observed in animals over five years of age. These infections are most prevalent in warm seasons but may occur at any time.

SYMPTOMS

The presence of blackleg or malignant edema in a herd is often first indicated by sudden death of one or more animals. If infected animals are observed before death, one may note marked lameness, local muscle swelling and severe depression. Affected animals are often unable to rise. A high fever may be present early in the disease, followed by subnormal temperatures in later stages. Death usually comes within 24 to 48 hours after first signs are observed.

In early stages of the disease, the muscle area in which the infection locates is frequently swollen and hot. Later, the area becomes cold, and fluid and gas may be felt beneath the skin.

Failure to detect such lesions in the live animal does not rule out the possibility that malignant edema or blackleg may be present. Lesions are often small and may be overlooked or they may occur in areas where they are difficult to detect.

DIAGNOSIS

A preliminary diagnosis of blackleg or malignant edema may be made in the living animal on the basis of clinical signs and the presence of typical muscle swellings. Post-mortem examination may reveal areas of dark, discolored muscle with accumulation of bloody fluid and gas bubbles, although these findings may be inconclusive since decomposition of clostridium-infected carcasses progresses rapidly and lesions may be masked by it.

Lesions of blackleg are most often found in the upper part of a leg; although the infection may localize in any muscle of the body including the tongue, jaw, neck, heart or diaphragm. Malignant edema lesions may occur in any muscle but are usually associated with a wound.

In cases where the diagnosis is in doubt, and in order to determine the type of infection present, the examining veterinarian may submit specimens to a diagnostic laboratory. Blackleg and malignant edema must be differentiated from lightning stroke, anthrax, bacillary hemoglobinuria (another clostridial disease also known as redwater), and various acute poisonings.

CONTROL

Control of these diseases is based upon a proper vaccination program. Vaccines

are available for most clostridial organisms and are effective if properly applied. Where the disease is known to be common, calves may be vaccinated at an early age; however, if vaccinated before six months old, they should be revaccinated. Calves vaccinated after they are six months of age usually are protected for several years.

Most vaccines currently available provide protection against both blackleg and malignant edema. Some contain blackleg in addition to other products, such as infectious bovine rhinotracheitis (IBR) or Pasteurella.

The prevention program in sheep ordinarily consists of vaccinating ewes about three weeks before they have their first lamb. Animals so vaccinated are usually permanently protected. Lambs born to immune ewes are resistant to the infections until about three weeks of age. Castration and docking should be carried out within this time in order to take advantage of this period of natural protection. Sheep vaccinated before one year of age should be revaccinated as yearlings.

TREATMENT

Treatment of animals affected by blackleg or malignant edema is seldom effective. Occasionally, massive doses of antibiotics given early in the course of the disease may save an animal, but clinical signs are seldom detected early enough to allow effective treatment.

The key to preventing losses due to these infections is a good immunization program.

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