BLACKLEG, one of the most infectious of diseases and one that usually proves fatal, affects young cattle particularly. It can be prevented by vaccination. Proper disposal of animals that have died of the disease is very important.

BLACKLEG, also known as quarter ill, symptomatic anthrax, emphysematous anthrax, and black quarter, is an acute infectious and usually fatal disease which attacks young cattle between 6 months and 2 years of age. Goats and sheep are susceptible to and occasionally contract the disease, but other animals appear to be immune.

This disease is caused by *Clostridium chauvoei*, which is an anaerobic micro-organism, that is, one that develops rapidly only in the absence of oxygen. These organisms are in the form of short rods and produce spores that are very resistant to destruction by heat, cold, drying, or chemical disinfectants. Usually the organism gains entrance into the body of the animal through small cuts or punctures in the skin; large cuts or open wounds are not favorable for growth of the organism. In some cases the organism may enter the body through abrasions in the mucous membranes of the tongue, mouth cavity, or throat.

In localities where blackleg occurs frequently, it is the young cattle, especially those between the ages of 6 and 18 months, that are usually infected. Calves 4 to 5 months old sometimes become infected, but an increase in the number of cases is noted with an increase in age. Very young animals evidently have an inherited or natural immunity which gradually wears off as they approach 6 months of age. The disease is seldom contracted by cattle past 2 years of age, and almost absolute immunity is noted after 3 years.

**SYMPTOMS**

The symptoms of blackleg are so characteristic that it is possible to recognize the disease easily. The first symptoms to be noted are

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high fever, loss of appetite, and a suspension of rumination, followed by great depression. Breathing becomes more rapid than normal. In most cases the animal has difficulty in moving about, and it frequently lies down. Rapidly developing swellings or tumors in the tissues under the skin are characteristic. They may appear on the neck and shoulders, beneath the breast, and on the flanks and thighs, and in some instances they appear on the gums, the base of the tongue, and the wall of the pharynx. The tumors are accompanied by severe febrile symptoms. At first small and painful to the touch, they rapidly increase in size and may cover a considerable part of the body. Upon pressure the tumors make a peculiar crackling sound which is due to the collection of gas formed by the causative micro-organisms.

As the swellings increase in size, the symptoms become more intense. The temperature may reach $107^\circ$ F., and the respiration may increase to 140 or more a minute. The animal is unable to rise, the extremities become cold, and the temperature usually falls and may become subnormal shortly before death. Violent convulsions and trembling of the muscles are noted before death. Although there are some recoveries, death generally occurs in 12 to 36 hours after the first appearance of the disease.

The carcass of an animal dead from blackleg soon becomes distended by gas, partly through fermentation in the gastrointestinal tract and partly through the formation of gas in the tissue under the skin. Marked distention is noted in the region of the blackleg tumors and where there is loose tissue, especially between the shoulder and the chest and on the outer surface of the hindquarters. In many instances this distention causes the legs on the upper side to stand out straight from the body. Shortly after death a dark, blood-colored, frothy discharge flows from the nostrils and anus. An incision made through the skin into the affected muscle tissue fails to demonstrate any decomposition, but it is possible to detect a characteristic sweetish-sour odor.

The skin covering the blackleg tumors is affected with dry gangrene. The distended muscles, which are easily torn, are dark brown or black, and the spaces surrounding them are filled with bloody liquid and gas. The blood in the badly affected parts of the body is thick and charged with gas and has a disagreeable odor. In the remaining parts of the carcass the blood is normal and coagulates easily after death, forming a solid clot. Hemorrhages are found on the heart and lungs. The spleen is always normal, but congestion is noted in the liver.

Thus it may be seen that a post-mortem examination should serve to distinguish blackleg from other diseases. Nevertheless, though a diagnosis may be made at autopsy, it is sometimes advisable to send specimens from affected animals to the laboratory for a conclusive diagnosis.

**TREATMENT AND PREVENTION**

Medicinal treatment of animals has thus far proved unavailing. The only reliable and effective means known for protecting animals
against blackleg is vaccination, which has been thoroughly tried and proved to be reliable.

Vaccines for protection against blackleg have been greatly improved in recent years. Those produced at the present time include blackleg bacterin, natural aggressin, cultural aggressin, cultural vaccine, and tissue vaccine. These vaccines are used extensively in the United States and give excellent results, as they confer immunity without producing any vaccination disease.

As vaccine is a preventive and not a curative agent, it is useless to vaccinate an animal after the symptoms of blackleg have developed. The immunity conferred by vaccination varies according to the kind of vaccine used and may last 12 to 18 months or longer.

Antiblackleg serum is produced for treating calves already affected with blackleg, as well as for creating a temporary passive immunity in exposed animals in an infected herd. At present the product is rarely used in the United States, but if it is available at the onset of the disease it may be efficacious in some cases.

When blackleg occurs on a ranch or farm it is of the utmost importance that owners of cattle in the district realize that every animal affected with the disease may be the means of propagating and disseminating the infection. Losses may not occur immediately on infected premises; in some cases they occur only after a lapse of years. It is recommended, therefore, that every effort be made to reduce the danger of infection by taking appropriate measures to dispose of all dead animals and with them the infection they carry. The carcass should be entirely destroyed by burning if this is possible. Otherwise a hole 6 feet deep should be dug and the body placed therein and well covered with quicklime before the earth is filled in. Any place where the animal was lying should be thoroughly sprinkled with a strong disinfectant, such as a solution of commercial lye and hydrated lime (2½ pounds of lye and 2½ pounds of lime in 8½ gallons of water).

The eradication of blackleg infection from pastures is difficult. In most cases it is impossible to pasture livestock on other land long enough for the infection to die out. It appears, therefore, that vaccination is the only practicable and effective means of protecting cattle against blackleg. If vaccine is used year after year to prevent the development of new cases over a long period, it is possible that the old infection will finally disappear.