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## Anthrax

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# ANTHRAX



COOPERATIVE EXTENSION SERVICE  
SOUTH DAKOTA STATE UNIVERSITY  
U. S. DEPARTMENT OF AGRICULTURE

# ANTHRAX

by Dr. C. A. Kirkbride, D.V.M., assistant professor of veterinary science

Each year, from July through late fall, anthrax is reported in South Dakota. The usual victims are cattle, but occasionally swine, sheep, and horses are affected. The disease occurs most frequently along the Missouri River, but occasional outbreaks happen in all regions of the state. The infection is most common where pastures are subject to flooding and frequently occurs when fall rains follow a dry summer. Grazing short pastures seems to increase the likelihood of infection.

Because *Bacillus anthracis*, the organism which causes anthrax, is relatively large, it was easily seen with the crude microscopes used by early bacteriologists. It was one of the first bacteria shown capable of causing disease, and this knowledge was the beginning of the modern "germ theory" of infectious disease.

*B. anthracis* is a spore former; that is, under certain conditions it is capable of gathering the essential contents of its cell into a rounded body about one-fifth of the normal cell size. This spore is capable of lying quiescent for 40 years or longer until suitable conditions occur, when it returns to its active or vegetative state fully capable of producing disease. The spores withstand drying for many years, and dry heat (120 C, 248 F) kills them only after an hour or longer exposure.

Animals become infected by ingesting the spores in contaminated feed, water or pasture forage. The infection is transmitted from an infected animal to another by biting insects, especially horse flies, but otherwise does not pass easily from one animal to another. Frequently, sudden death is the first sign of an anthrax outbreak. Later, less acute cases occur, and affected animals are found with high fever, rapid breathing, tremors and convulsions. Death ordinarily occurs within hours of the onset of the signs of disease.

Cattle and sheep are most susceptible to anthrax and often have the very acute form. Horses also are highly subject to the infection and usually have the acute form. Swine are more resistant, and they may live 2 or more days after the onset of signs of the disease.

The carcasses of animals dead of anthrax undergo rapid decomposition; and rigor mortis, the stiffening

of the muscles after death, does not occur. Blood frequently exudes from the body openings and it does not clot normally. Horses and swine frequently have watery swellings of the throat.

If there is good reason to believe an animal has died of anthrax, the carcass should not be opened. Anthrax organisms are rapidly destroyed in an unopened carcass, but if they are exposed to air they will sporulate. They then become resistant to environmental conditions and persist for years as a source of infection. Anthrax carcasses should be buried at least 6 feet deep or burned completely.

Humans can contract anthrax by ingesting or inhaling the anthrax spores or through an open wound. When the spores are inhaled or ingested, systemic infection occurs which frequently ends in death. Such infections are rare in the U.S. Skin infections from wound contamination occur more frequently and ordinarily can be controlled with antibiotics.

Anthrax must be distinguished from other conditions such as acute bloat, lightning stroke, black-leg, malignant edema and other acute infections and conditions which cause sudden death in livestock. When anthrax is suspected, a veterinarian should be consulted and his judgement concerning the advisability of performing a post-mortem examination followed. Specimens for submission to a diagnostic laboratory can be taken without opening the carcass and promoting sporulation of the anthrax organisms.

Several types of vaccine are available for the prevention of anthrax. Some are more effective than others and some are safer than others. Some anthrax vaccines will cause the disease under certain circumstances, and all of them should be used by or under the supervision of a veterinarian. In areas where the disease occurs frequently, yearly vaccination is advisable. Where the disease occurs only sporadically, vaccination should be done on advice of a veterinarian.

Treatment of affected animals with certain antibiotics or antiserum is effective only if applied very early in the course of the disease.



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South Dakota State University  
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