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Questions and Answers on
**Anthrax Prevention
and Treatment**
in South Dakota

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What is Anthrax?

Anthrax is a contagious disease that affects all domestic animals. It is characterized by high fever, rapid pulse, difficult breathing, and death within three hours to seven days. It affects animals and humans in the order named: Cattle, horses, mules, sheep, hogs, people, dogs, cats, and poultry.

What is the cause of anthrax?

This disease is caused by a germ (anthrax bacillus) and this germ has the power of forming a spore or putting a protecting shell around itself. The spore form of this organism is one of the most resistant germs known and will live in the soil for as long as twenty years.

How is anthrax spread or carried from one animal to another?

Probably most outbreaks are started by germs in the soil. They may be brought out of the soil on plants. After the disease gets started in the herd, cattle flies carry it to other animals. It may be carried by anything which will carry germs.

Where are the more important anthrax districts located in South Dakota?

From a nation wide standpoint the whole state is considered anthrax infected territory and is also considered the largest anthrax district in the United States. From a state standpoint, there are certain areas where anthrax is more virulent and where it may be expected to break out any year. Those areas are, Haakon and Stanley counties; eastern part of Meade county along the Cheyenne river; along the White river in Mellette, Jones and Lyman counties; along the west side of the Missouri river in Gregory county; on the east side of the Missouri river in Charles Mix and Brule counties; a small area in Turner, Yankton and Clay counties centering around Wakonda and Centerville; a small area including eastern part of Miner county, the western part of Lake county, the northeastern part of McCook county and northwestern part of Minnehaha county; an area centering around Carpenter including eastern part of Spink county, the western part of Clark county, the northeastern part of Beadle county and

the northwestern part of Kingsbury county; and an area centering around Pierpont in Day, Marshall and Brown counties. The rest of these areas is by no means complete and is not intended as being complete, but they are the larger areas in the state infected with anthrax. Many cases of anthrax have occurred in other areas not mentioned during the history of this disease in South Dakota.

What are the symptoms of anthrax or how does it act?

In cattle the disease usually kills the animal rather quickly, maybe within a few hours. Usually the bull or heavy cows are the first to take the disease. A few of the cattle will live longer and the disease may run into a chronic form. This type will develop swellings over the body and these swellings usually show a bloody sweat. Many of the animals will pass blood in the various excretions. A few cases will recover. The disease is similar in sheep and horses, but rather slow acting in hogs. Hogs usually swell in the throat, breathe hard and may pass blood from the nose.

What are some of the differences between anthrax and blackleg?

Anthrax will affect cattle at any age while blackleg attacks the young fat animals. Anthrax is prevalent in July and August while blackleg occurs more often in the spring of the year. Some cases of anthrax will recover while blackleg is al-

ways fatal. Horses and hogs have anthrax but do not have blackleg. Sheep are susceptible to blackleg but seldom have it.

How does the inside of an anthrax carcass show evidence of anthrax?

Post-mortem examinations should never be attempted by laymen as there is too much danger of infection. In fact it is seldom necessary for veterinarians to hold post-mortems on these carcasses. A better method is to collect a blood sample and have it examined by the use of a microscope. It may be of interest, however, that the blood of an anthrax animal does not clot readily and the spleen is enlarged and black in color.

What is the best way to dispose of a carcass of an animal which died because of anthrax?

Burn it to ashes. There are various methods of doing this but the most commonly used method is the "manure" method. Cover the animal with hay or straw, then haul two loads of wet manure and place this over the straw covering the carcass completely. Set fire to the straw. It will probably be necessary to add more manure later.

Why not bury carcasses?

Burying is all right if properly done. The carcass should be six feet under ground and covered with half a barrel of quicklime. However, the usual method of burial is not satisfactory because the animals are

not buried deep enough. If very many carcasses are to be buried it will entail considerable labor.

Is it necessary to quarantine herds infected with anthrax?

The quarantining or isolating of sick animals is the first principle in controlling any contagious disease. It helps to prevent the spread of the disease. In all cases the neighbors should be notified of the existence of the disease and be given a chance to take care of their herds.

Does moving cattle to other pastures help to stop an outbreak of anthrax?

On some farms or ranches certain pastures are known to be infected with anthrax. It is advisable to keep the cattle out of these pastures during hot weather. In case of an outbreak of anthrax, a change of pasture may slow up the spread of the disease but should not be depended on entirely to control the outbreak.

VACCINATION

Considerable misunderstanding is usually prevalent in regard to the various methods of vaccination to prevent anthrax. Losses occur after vaccination and farmers wonder whether any of the various products and methods have any value. There are a number of biologics used for this purpose and they may be described as follows:

What is the pellet or pill form of vaccination?

These pellets are attenuated or weaken-

ed spores. They are made by using ground tissue and heating it to 60 degrees centigrade for several hours. The material is made into the form of a pellet or pill and given to cattle subcutaneously, or under the skin, by the use of a pill gun. The germs of anthrax in this product have been weakened by heat. Immunity starts to build up in about ten days. This product should not be used in hot weather as there are too many cases of reaction in the animals. Do not use on sheep, horses, or hogs.

What is the liquid spore form of vaccination?

In this case the spores are suspended in a liquid instead of being in a dry mass. The product contains attenuated or weakened germs of anthrax. The dosage varies with the company putting it out but is always given on the bottle—generally 2 cc. It is given to cattle with a hypodermic syringe subcutaneously. This liquid spore is made in four grades and numbered one, two, three, and four.

No. 1 liquid spore is the weakest and does not confer much immunity. It is primarily used to prepare the animal for a stronger dose ten days later.

No. 2 liquid spore is stronger than number 1. It is commonly used as a single treatment by cattlemen to prevent anthrax. This single treatment is not advised during the anthrax season or in hot weather. It may "get by" if given early in the spring.

It would be better to prepare the animal by giving a number one spore ten days previous at any time of the year. The use of a number one liquid spore and ten days later the use of number two liquid spore is a good preventive treatment in cattle to be used in April, May and up to June 15, because it is cheap and it is effective. The only disadvantage is the necessity of handling the cattle twice. The number two spore is frequently used in combination with serum as the simultaneous treatment.

No. 3 liquid spore is stronger than number two. This product should never be used unless the animal has been prepared by the injection of number one and number two liquid spores at ten day intervals or unless serum is given at the same time.

No. 4 liquid spore is the strongest liquid spore made. It should be handled only by veterinarians as it requires a very large dose of serum (50 cc or more) to be given at the same time.

There are certain liquid spores put on the market under trade names which are in concentrated form. These spores are suspended in a solution that slows up the absorption. The usual dose is 1 cc given subcutaneously. The strength of these may vary from a number two to a number three spore.

What is the simultaneous treatment?

This consists of giving a liquid spore (usually a number two, in some cases a

number three and in extreme cases under close supervision of a veterinarian a number four) and at the same time a dose of serum. Most veterinarians use not less than 20 cc and generally 30 cc or more. The dose of serum increases with the strength of the spore. This is the method of vaccination advised during the anthrax season for cattle.

What is the serum alone treatment?

This consists of giving serum only (no spores) and is commonly used in a sick herd. The sick animals are given very large doses of serum. Immunity is built up very quickly or as soon as the serum is absorbed. However, serum alone gives immunity for about 15 days. Serum alone is a safe treatment because it is germ free. The only danger is in using horse serum on cattle if a second dose is given. In general, bovine serum should be used on cattle but equine serum may be used.

What is a bacterin?

A liquid product containing killed germs. There is no danger in the use of this product. It does not give as quick immunity as does serum but lasts longer when immunity is built up. It is a good product for horses during an outbreak of the disease. It may be used in combination with serum.

What is antigen?

A liquid in which washed sterile germs are suspended. The usual dose is 2 cc. subcutaneously. It is rather a new product and

has not been used to any large extent in South Dakota. It begins to build up immunity in about one week. It has no value in treating a sick animal. It is a product to be used in the spring of the year rather than during the anthrax season.

What is aggressin?

A germ free product in liquid form. It is used mostly in states which do not allow the use of spores. There is little place for the use of this product in a territory where the virulency of anthrax is as strong as it is in South Dakota.

What is the intradermal treatment?

It consists of giving a very small dose of refined spore vaccine into the skin (not through it). It can be given only by veterinarians. Builds up immunity in four or five days. It has an important place in spring vaccination and probably is the most desirable of any preventive treatment in neighboring herds of cattle when anthrax exists in the community.

When should cattle be vaccinated?

On all farms with a history of anthrax, the cattle should be vaccinated during April or May. If veterinary service is available it should be left to the judgment of the veterinarian as the product used as he knows the local conditions better than any other person. If veterinary service is not available and it is necessary for the cattle owner to vaccinate his own cattle, the liquid spore is recommended in badly

infected territories such as those mentioned in the list previously given. It is again stated for emphasis that it is better to give a number one liquid spore and follow this in ten days with a number two liquid spore than trying to get by with giving only the number two spore. The bacterin (germ free) treatment is a safe treatment and has an important place in the milder infected territories.

When anthrax is present on the farm all cattle should receive serum. The sick cattle should receive a large dose of serum. The immunity may be prolonged by the simultaneous injection of a liquid spore but the spore should not be given to sick cattle. On horses and sheep use serum only, or bacterin. Do not vaccinate hogs unless some are sick and then use serum only. When anthrax is on the neighboring farm vaccinate cattle (only) with the simultaneous treatment or intradermal treatment. When anthrax is more than five miles away do not vaccinate any livestock until it gets closer. This statement applies to east river conditions in South Dakota and also applies to the anthrax season or hot weather.

It makes no difference who does the vaccinating or what product is used on a sick herd, there may be losses of animals as long as three weeks after vaccination.

What is the most important thing to do in controlling an outbreak of anthrax?

Secure the services of a veterinarian wherever possible.