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Anthrax Questions

Anthrax has certainly been in the news for the last two months. Not because of outbreaks in cattle, but because of bioterrorist attacks here in the United States. Yes, we did recently have a single outbreak of anthrax in cattle in California, but that's not why anthrax has been on the news most nights. When people contract anthrax they usually get either the cutaneous form (most common) or the inhalation form (much less common) of the disease. Cattle, on the other hand, do not commonly exhibit either of these forms of anthrax, but have a "blood borne" form most commonly. I thought I would take this opportunity to answer some of the common questions that have arisen about this disease in cattle over the last few weeks.

What causes anthrax in cattle?

The disease, anthrax, is caused by a bacterial species called *Bacillus anthracis*. The organism is a common inhabitant in alkaline soils. The anthrax bacteria compete very well in conditions that alternate between floods and droughts. The organism can multiply in wet conditions and when dry conditions come along, it forms spores, which are very resistant to environmental conditions. The spores can survive for more than 35 years in the environment, waiting for the next favorable opportunity to multiply once again. Cattle contract the disease when they ingest (eat) the spores. The grazing of abrasive forages is thought to allow penetration of the spores through the lining of the mouth. Once the anthrax organism gets into the blood stream and multiplies a fatal infection can occur rapidly.

What conditions does the anthrax organism prefer?

The anthrax bacillus prefers alkaline soils and alternating periods of flooding and drought. These are the conditions that are common in parts of California (such as the Delta) and southern Oregon. These same conditions commonly occur in parts of Texas, Louisiana, Arkansas, Missouri, and South Dakota. These states also experience outbreaks of anthrax from time to time.

When should I suspect anthrax?

When cattle become infected with the anthrax organism the disease usually proceeds rapidly. Most often, the cattle appear to be normal one day and are found dead the next. Anthrax usually occurs on the same premise on an irregular basis. Therefore, there is usually a history of anthrax occurring on a ranch or at least in the general area. Often, certain fields are known to be "hot" areas for possible occurrence of anthrax. So, sudden death in animals in these areas should raise suspicion. Also, cattle with bloody diarrhea, bloody urine, and blood coming from the nose should make you very suspicious of anthrax.

If I suspect anthrax, what should I do?

Call your veterinarian and do not disturb the carcass or move the animal. Your veterinarian will take a minimal number of samples if anthrax is suspected. Usually a blood sample from the jugular vein, part of an ear, or an eye will be carefully taken and submitted to the diagnostic laboratory. It is important to not open the carcass. The anthrax organism will die out in an unopened cattle carcass in a few days. However, if the carcass is opened to the air, many billions of spores will form and these spores can survive in the environment for decades. The California Animal Health and Food Safety Laboratory will usually confirm an anthrax diagnosis within a day or two of receiving the samples or the carcass.

What will happen if I have a case or outbreak of anthrax?

The live cattle at risk will be moved away from the suspected area of spore contamination. They will be fed hay or put onto permanent pasture. The cattle will be treated with penicillin as recommended by your veterinarian and the California Department of Food and Agriculture's Animal Health Branch. The cattle will also be vaccinated with the anthrax vaccine. The CDFA and your county health officials will advise regarding the proper disposal of the dead animals. Usually, the dead cattle are buried and covered with quicklime.

If my cattle die of anthrax, am I, my employees, or family at risk of contracting anthrax?

Probably not, but you should check with your physician immediately and continue to be monitored. The disease in humans usually responds to treatment **IF** caught early, but can be deadly if detection and treatment is delayed. Also, your veterinarian, the CDFA, and your county public health officials will also provide you with advice on how to prevent human

cases.

What can I do to prevent anthrax in my cattle?

Most ranches in California will never have to worry about anthrax or preventing the problem. However, on premises that have a history of anthrax preventive methods must be considered. In cases where specific areas are identified as "high risk" those areas need to be avoided, particularly in the summer and fall months. Also, there is an effective vaccine for cattle and it should be given before the cattle are placed into these areas. Therefore, with vaccination of the cattle and avoiding "high risk" areas anthrax can be prevented in almost all instances.

Is the cattle anthrax vaccine the same vaccine used in people?

No, the vaccines are quite different. The cattle vaccine is a live anthrax vaccine that stimulates immunity but does not cause disease. It is referred to as the Sterne spore vaccine. The vaccine approved in humans is a cell-free filtrate vaccine and requires a number of initial injections followed by yearly boosters.

Why is anthrax used for biological warfare and bio-terrorists?

The reason is the spores are very easy to store for long periods of time. The spores will survive and be infective for many decades and can thus be stored in weapons of various sorts. Also, the spores retain their ability to produce disease indefinitely. The spores can also be spread easily by aerosol methods over large areas.

Anthrax has been around in the California environment for thousands to millions of years and will probably continue to exist in nature. Agricultural activities in California have greatly decreased the risk of anthrax over the last century. Remember, this organism thrives in situations of alternating floods and droughts. By leveling land, controlling floods, and using irrigation we have limited the areas at risk for anthrax. This is just another public health benefit of modern agricultural practices.

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