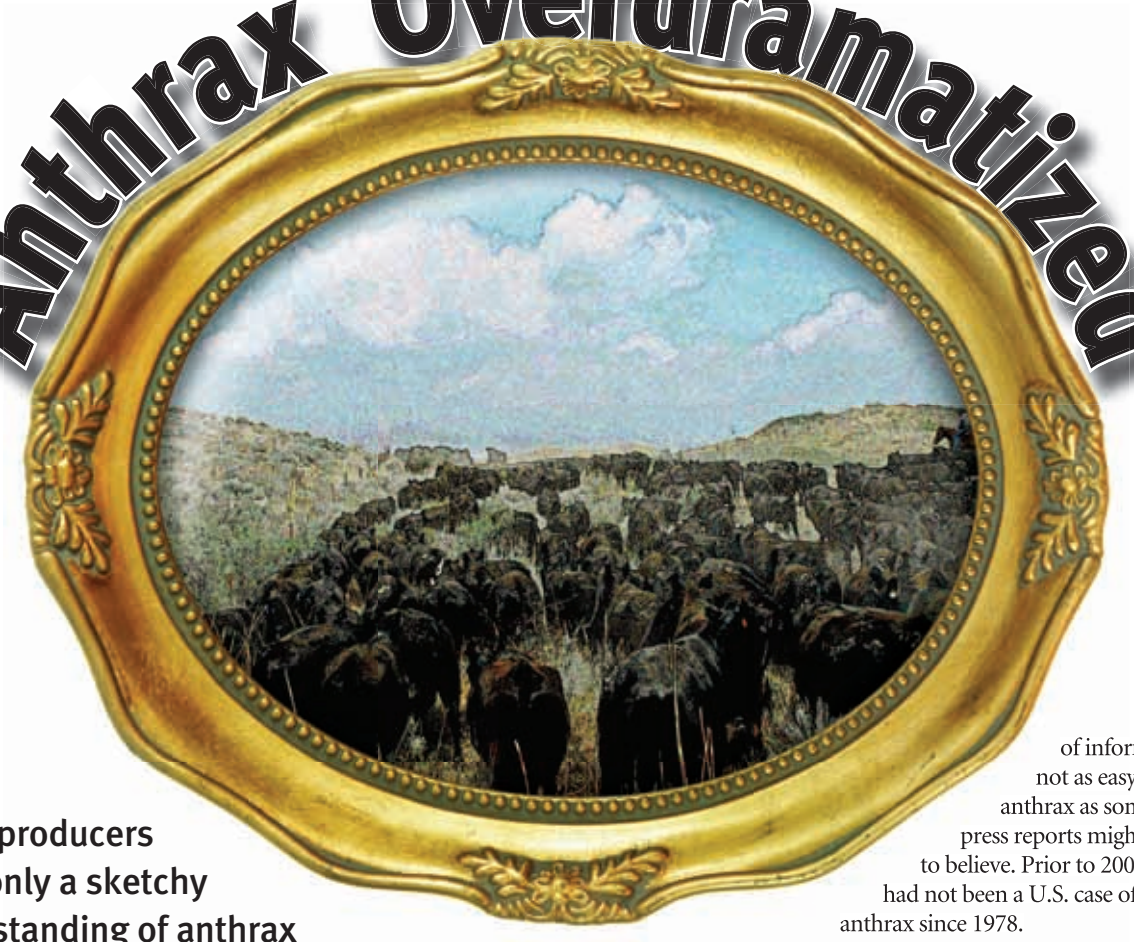
Anthrax Overdramatized



Many cattle producers have only a sketchy understanding of anthrax and how animals or humans become infected.

by ***Troy Smith***

If you're a Western movie buff, you might remember how anthrax figured into the story lines of some old cowboy flicks. The dreaded disease struck fear in the hearts of cattlemen, sheepherders, homesteaders and townspeople alike, for not only did it kill livestock, but humans were susceptible, too. Tension between factions usually grew out of suspicion that a northbound trail herd harbored anthrax. The threat of bloody range war loomed large until a white-hatted hero delivered a peaceful solution to the conflict.

The fear of anthrax, which fueled panic among movie characters, was a bit exaggerated. Of course, exaggerated perceptions of a threat are common in movies and television shows. It's done to heighten the drama. But it happens in real life, too, particularly when the popular media dramatizes coverage of an event that might pose a threat to public health. Then, because they have too little information or misinformation, some people overreact.

It happened in 2001, after letters containing the bacteria that cause anthrax were distributed through the U.S. postal system. As a result, 22 people were infected by inhaling the organism, five of whom died, and anthrax catapulted to the top of the list of potential weapons of bioterrorism. The seriousness of the event is not to be taken lightly. However, it reportedly prompted huge jumps in consumer purchases of antibiotics, gas masks and home air-filtering devices. Hearing that anthrax affects livestock, some consumers also worried about becoming infected by eating meat.

Anthrax as a biological weapon can't be discounted, but those purchases and those worries were reactions based on a lack of information. It's not as easy to contract anthrax as some popular press reports might lead readers to believe. Prior to 2001, there had not been a U.S. case of inhalation anthrax since 1978.

If a person does become infected, there is little chance of the disease spreading to another. And there are no documented cases in the U.S. of humans contracting the disease from properly processed and adequately cooked meat.

Rather than relying on dramatized reports and Internet blog sites, consumers can get the real scoop on anthrax from the Centers for Disease Control and Prevention (CDC). The National Agricultural Biosecurity Center, state departments of agriculture and state veterinarians' offices also offer unbiased information for consumers and livestock producers.

The Minnesota Board of Animal Health's web site includes information about that state's most recent cases of anthrax — two cows found dead in a pasture during April. In July, South Dakota's state veterinarian confirmed three anthrax-related cattle deaths. North Dakota and Texas have also reported cases this year, involving horses and goats.

Under the surface

Caused by a rod-shaped, spore-forming bacterium (*Bacillus anthracis*), anthrax is

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endemic to most of the world. All warm-blooded species are susceptible. Reports of anthrax among livestock aren't nearly as common in the U.S. as in many other countries, but neither is the disease a stranger.

Outbreaks occur more frequently in a region that parallels the old cattle trails, running northward from Texas into the Northern Plains and upper Midwest. However, areas of California and the Southeast have seen repeated outbreaks.

According to Linda Glaser, senior veterinarian for the Minnesota Board of Animal Health, announcements of confirmed cases typically prompt calls with questions about the disease and its prevention.

"It does provide a teaching opportunity," Glaser says, noting that many cattle producers have only a sketchy understanding of anthrax and how animals or humans become infected.

"It does not spread directly from one animal to another. Ruminants, including cattle, sheep, goats and horses, typically pick up anthrax spores from the soil while grazing," Glaser explains. "Most cases occur in areas where animals have died of anthrax in the past and the soil has become contaminated. Spores can remain viable in the soil for a very long time — for years."

Evidence suggests anthrax spores revert to a vegetative state and multiply when environmental conditions of soil, nutrition, moisture and temperature are optimal. But even in endemic areas, anthrax rears its head irregularly. Many years may pass between outbreaks. Epidemics have often occurred following events such as heavy rainfall, flooding or drought, suggesting these events may bring anthrax spores to the soil surface.

"The association between outbreaks and environmental conditions doesn't always hold up," Glaser says. "It doesn't always follow a pattern."

When a critter does become infected, the incubation period for anthrax usually is three to seven days. In its peracute form, it appears to strike suddenly, taking a rapidly fatal course. Infected cattle and other ruminants may stagger, collapse, convulse briefly and die, without any previous signs of illness. Sudden deaths due to anthrax have been confused with clostridial infections, such as blackleg, and cases also have been mistakenly reported as lightning strikes.

Symptoms of the acute form of anthrax include fever, trembling and a period of anxiety followed by depression. Advancing signs include difficulty in breathing, convulsions and death. The disease typically takes the acute form in horses, accompanied by severe colic, anorexia, bloody diarrhea and swelling in areas of the neck and abdomen. Death usually occurs within two to three days of the onset of symptoms.

In deaths due to anthrax, animals often hemorrhage from the mouth, nose and rectum. Rigor mortis is frequently incomplete or absent, and rapid decomposition of the body is common.

According to Glaser, if a producer suspects an animal died due to anthrax, the carcass should not be touched or moved. A postmortem examination should not be performed, since opening the carcass can contaminate the immediate area.

Anthrax is a reportable disease, so the producer should contact a veterinarian for confirmation by testing of a blood sample.

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If anthrax is confirmed, all animals on the farm or ranch where the death occurred are placed under quarantine, in accordance with state regulations. Carcasses must be burned, and their remains must be buried under supervision of state animal health authorities. State protocols generally require treatment of remaining animals with antibiotics and vaccination.

"Producers need to know anthrax is preventable through vaccination," Glaser states. "We recommend annual preventive vaccination of cattle in areas where the disease has occurred previously. It is most effective when given in the spring, prior to the grazing season, but vaccination is also advised in the face of an outbreak."

Effect on humans

In humans, anthrax occurs in three forms. According to the CDC, about 95% of cases involve skin infection, or cutaneous anthrax. It results from spores entering cuts or abrasions on the skin of workers handling hides, wool or hair products from infected animals. Skin infection starts as an itchy, raised bump similar to an insect bite. It generally develops into a vesicle and then a painless ulcer. Surrounding areas of tissue may be swollen, along with adjacent lymph glands.

Cutaneous anthrax responds to treatment with antibiotics, and deaths are very rare. This is the only form of the disease known to spread from one person to another, but that, too, is rare.

Those cases resulting from the 2001 bioterrorist attack were examples of inhalation anthrax, which is far more serious. Early signs resemble common cold symptoms but progress to severe respiratory problems and shock. Inhalation anthrax is usually fatal, even with aggressive antibiotic therapy.

Intestinal anthrax is the most rare form, but it can result from eating raw or undercooked meat from infected animals. Symptoms mimic those of food poisoning — nausea, vomiting, fever, abdominal pain and severe diarrhea. Symptoms may also include sore throat, difficulty swallowing and swelling of lymph glands in the neck. Intestinal anthrax can be fatal, but early treatment with antibiotics usually is effective.

A vaccine has been licensed for human immunization against anthrax. It is mainly used to protect laboratory personnel who work directly with the organism and military personnel deployed to countries where there is a high risk of exposure. Veterinarians who travel and work in high-risk areas are also advised to consider vaccination.

For more information about anthrax, its relative threat to livestock in your area and recommended control measures, contact your state veterinarian's office. Information is also available through the National Agricultural Biosecurity Center web site (*http://nabc.ksu.edu*) or the Centers for Disease Control and Prevention site (*www.bt.cdc.gov/Agent/Anthrax/*).

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