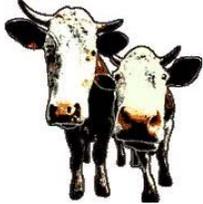




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Local Fodder

October 2001 Anthrax Information Supplement

Inside this issue

- ◆ Anthrax Information for Livestock Owners PAGE 1
- ◆ Anthrax CDFA Fact Sheet PAGE 2
- ◆ Anthrax: What Livestock Producers Should Know PAGE 3
- ◆ Centers for Disease Control Anthrax Technical Information PAGE 5

ANTHRAX INFORMATION FOR LIVESTOCK OWNERS

The recent cases of anthrax along the East Coast and Nevada have many people on high alert for more incidences of infection. While all the recent cases have occurred in humans, anthrax has traditionally been considered a livestock disease. All mammals are susceptible to anthrax and ruminants such as cattle and sheep are especially susceptible.

This supplemental issue of *Local Fodder* provides information that livestock owners and handlers should know to keep themselves, their livestock, and their neighbors' livestock safer from anthrax and other biological agents.

While bioterrorism has not been reported in crops and

livestock, the possibility exists and is certainly not beyond the perpetrators of the recent outbreaks. Given the potential for large-scale damage to the agricultural industry in California, it would be prudent to be vigilant over your livestock operation. There are several steps you can take to increase biosecurity in your livestock operation. Remember that anthrax is only one of several potential threats.

- Quarantine all new animals for 30-60 days.
- Test new animals for important diseases.
- Provide foot baths at entrances and exits of confinement facilities.
- Keep grounds and feed bunks as dry as possible.
- Minimize the number of visitors.
- Minimize visitor's contact with animals.
- Do not allow foreign visitors to bring any clothing, foods, or accessories they have had in another country onto the farm.
- Be sure all equipment brought onto the farm is disinfected, or that disposable equipment is used.
- Be sure all employees understand and follow the biosecurity protocol.
- Immediately report trespassers to your local sheriff.

If an animal dies suddenly it should be examined by a veterinarian or taken to the vet diagnostic laboratory (California Animal Health and Food Safety Laboratory) in Davis. If anthrax is diagnosed, the California Department of Food and Agriculture (CDFA) is notified and will handle the situation from there on out. CDFA will tell the producer and vet how to dispose of any carcasses (burning or burying). The vet will advise the animal owner on treatment, vaccination, and preventive management (moving cattle to safer pastures, feeding hay, etc). Livestock vaccinations for anthrax are not routine except in endemic anthrax areas. Anthrax is endemic in the California delta region.

Anthrax: What Livestock Producers Should Know

October, 2000

Published in *California Cattlemen*, December, 2000

***Pacific Showcase*, November, 2000, and *American Dairy Farmer*, Jan. 2000**

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Anthrax is as old as antiquity. The fifth plague in the Bible's Book of Exodus speaks of "the hand of the Lord bringing a terrible plague on your livestock in the field – on your horses and donkeys and camels and on your cattle and sheep and goats". Some believe that the sudden death of these animals was due to anthrax. More recently, anthrax has been the topic of several news articles addressing concerns about vaccinating soldiers in the US military, bioterrorism threats, and naturally occurring disease outbreaks in cattle. Recent anthrax outbreaks in cattle include:

- Manitoba - 25 cattle die on five farms
- Minnesota - 15 cattle die on two farms
- North Dakota - 17 herds lose approximately 100 cattle to anthrax

Other deaths have been reported in South Dakota and Nebraska. While deaths from anthrax occur sporadically every year, these outbreaks in the Midwest are somewhat unusual. The California Department of Food and Agriculture has historical records of 34 anthrax outbreaks in 12 California counties. During 1984, an anthrax outbreak occurred in the Carrisa Plains that affected 12 general areas, and killed 43 cattle and 135 head of sheep. Since 1991, there have been 10 known cases of anthrax in California, nine of which occurred in cattle. Producers should be aware of the signs and risk factors of anthrax in cattle.

The bacteria *Bacillus anthracis* causes anthrax in all warm-blooded animals, including people. The bacterium are found in two states – the vegetative state and the spore state. The vegetative state is the growing, reproducing form of the bacteria found in infected animals and people, and is the state that causes the disease anthrax. If untreated the disease in animals is generally fatal, and if the carcass is opened by veterinarians performing a necropsy, scavengers, or by decay, the vegetative state is exposed to oxygen in the air. When the vegetative state is exposed to oxygen, it forms spores. The spores are highly resistant to disinfectants, remain viable for years in the soil, and are found naturally in the soil of California and many western states. When the spores enter another animal, usually through grazing contaminated vegetation or inhalation, the bacterium revert to the disease-causing vegetative form.

In cattle, the most commonly seen initial sign of anthrax is sudden death. The course of the disease is usually short and ranges from 1-3 days. Once an outbreak begins, animals may be seen with fever, lack of rumination, excitement followed by depression, difficulty breathing, uncoordinated movements, and convulsions. These signs progress towards death. Bloody discharges from the natural body openings, as well as edema in different parts of the body, are sometimes observed. Some animals may be saved if treated very early with penicillin or tetracyclines.

In animals that die, bloody discharges from the body openings may be seen. Decomposition is more

(Continued on page 3)

(Continued from page 2)

rapid than in other conditions and the carcasses become bloated with gases. Rigor mortis, or stiffening, is not complete. When necropsied, hemorrhages are found in the internal organs. Enlargement of the spleen is almost always present. An open, decaying carcass, as well as discharges and secretions from the carcass or dying animals, will contaminate the ground and protected spores will develop. Scavengers or veterinarians seeking to learn the cause of death may also open the carcass. Carrion-feeding animals may carry the infection to other distant locations. However, in unopened carcasses the vegetative form of the bacteria dies rapidly and does not form spores.

Most outbreaks occur in areas where animals have previously died of anthrax, as the spores remain viable for many years. Spores more than 35 years old have been able to cause disease. Often, the outbreaks occur after climatic change such as heavy rains, flooding, or drought. Climatic change brings spores to the ground surface and perhaps concentrates the spores in low spots. Working the land may also bring the spores up to the soil surface. Once the animals eat the spores, the vegetative state develops, multiplies, and causes anthrax. In August 2000, an anthrax outbreak in Nevada killed 30 cattle. This outbreak was associated with a recent cleaning of a ditch that may have disturbed spores deep in the soil.

When anthrax is suspected, dead animals should not be opened for routine examination, as the discharges and blood are highly infectious to humans and other animals. As previously stated, open carcasses will deposit enormous quantities of bacterium on the ground that will sporulate to the long-lasting, protected state. Your veterinarian can confirm anthrax by taking blood from a peripheral vein (ear or tail) and submitting it to the diagnostic laboratory. The bacteria can be seen in the blood when properly smeared and stained on a glass slide. There are other alternatives to a full necropsy.

In many states, anthrax is a reportable disease and your veterinarian is required to inform the state animal health agency when cases of anthrax are suspected. Quarantine of the premises and animals may be necessary. To prevent the spread of an outbreak, when possible, dead animals should be burned where they are found. An alternative is to bury the carcasses at a depth of 10 feet and cover the carcass with lime. The 1984 Carrisa Plains outbreak was associated with the movement of an infected band of sheep and the dumping of carcasses from this band in several locations. Improper carcass disposal may put other animals and people at risk. Your state animal health agency can provide helpful advice on carcass disposal and assist your veterinarian in controlling the outbreak. Vaccines are available to protect animals in endemic areas or when outbreaks occur.

Always keep in mind that anthrax can cause serious disease in people as well as animals. Three syndromes are recognized in people. The **cutaneous form** is usually seen in people who work with animal carcasses, wool, hides or fur. The infections are seen as large, local abscesses, black lesions, and edema often on the hand or finger. If untreated, these skin infections can spread to the blood stream and cause serious illness or death. More than 90% of human anthrax cases worldwide are the cutaneous form. In the last 15 years, there have only been 5 cases of human anthrax in the US and all have been the cutaneous form. Breathing in the bacteria causes the **pulmonary form**. Most lung infections result in rapid death. The **gastrointestinal form** results from eating the bacteria, usually in contaminated, undercooked meat, and is seen as violent intestinal pain with vomiting and bloody stools.

In August 2000, a Minnesota farm family of six slaughtered and sent a carcass from a down steer to a custom meat-processing plant. The steer was from a group of animals later confirmed to have had anthrax. After consuming the meat two reported gastrointestinal illness and anthrax was recovered from the uncooked meat. The entire family was given antibiotics to prevent anthrax and vaccinated against

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anthrax. Seven carcasses processed in the custom plant after the infected steer were condemned.

A high mortality rate is seen with the gastrointestinal form of anthrax if it is not recognized and treated. Meat originating from animals dying of unknown causes or suspected of having anthrax or any other infectious disease should not be consumed. Due to the potential for anthrax to produce serious, life-threatening disease in people, great care should be taken to protect anyone handling the carcass or live animals suspected of having anthrax.

In summary, anthrax is caused by bacteria that can exist in two forms. The vegetative form causes disease in both animals and people, but is rapidly killed in unopened carcasses. The spore form lives for years in the soil. When the spores surface, they revert to the vegetative form to cause further disease when eaten by animals. Carcasses of animals dying from anthrax should not be opened, because the vegetative form turns to spores when exposed to air. Use caution when handling animals or animal carcasses suspected of being infected with anthrax. Suspected cases of anthrax should be reported **first** to your veterinarian and then to state animal health officials. District animal health officials are available 24 hours a day to assist your veterinarian in managing an outbreak and minimizing losses.

For more information in California, call:

CDFA, Animal Health Branch

Headquarters	(916) 654-1447	Modesto District	(209) 491-9350
Redding District	(530) 225-2140	Fresno District	(559) 237-1843
Ontario District	(909) 647-4462		

Or visit the CDFA-Animal Health Branch Emergency Programs website at:
http://www.cdfa.ca.gov/ahfss/ah/emergency_management.htm

CENTERS FOR DISEASE CONTROL – ANTHRAX TECHNICAL INFORMATION

The information in this section addresses, but is not specific to, human anthrax.

Clinical Features Human anthrax has three major clinical forms: cutaneous, inhalation, and gastrointestinal. Cutaneous anthrax is a result of introduction of the spore through the skin; inhalation anthrax, through the respiratory tract; and gastrointestinal anthrax, by ingestion.

Incidence In the United States, incidence is extremely low. Gastrointestinal anthrax is rare but may occur as explosive outbreaks associated with ingestion of infected animals. Worldwide, the incidence is unknown, though *B. anthracis* is present in most of the world.

Sequelae If untreated, anthrax in all forms can lead to septicemia and death. Early treatment of cutaneous anthrax is usually curative, and early treatment of all forms is important for recovery. Patients with gastrointestinal anthrax have reported case-fatality rates ranging from 25% to 75%. Case-fatality rates for inhalational anthrax are thought to approach 90 to 100%.

Transmission For humans, the source of infection in naturally acquired disease is infected livestock and wild animals or contaminated animal products. Human-to-human transmission is extremely rare and only reported with cutaneous anthrax.

Risk Groups Cutaneous anthrax is the most common manifestation of infection with *B. anthracis*. Inhalation (pulmonary) anthrax occurs in persons working in certain occupations where spores may be forced into the air from contaminated animal products, such as animal hair processing. Occupational risk groups include those coming into contact with livestock or products from livestock, e.g., veterinarians, animal handlers, abattoir workers, and laboratorians.

Treatment Doctors can prescribe effective antibiotics. To be effective, treatment should be initiated early. If left untreated, the disease can be fatal.

Vaccine The vaccine is a cell-free filtrate vaccine, which means it contains no dead or live bacteria in the preparation. The final product contains no more than 2.4 mg of aluminum hydroxide as adjuvant. Anthrax vaccines intended for animals should not be used in humans.

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CALENDAR OF EVENTS

Goat Symposium
 Location: San Joaquin Fair, 1658 S. Airport Way, Stockton, CA
 \$15 before Oct. 29, \$20 after, registration begins at 8 AM, contact Troy Bowers (209) 466-5041 or Chris Schallberger (209) 333-0543 or Judy Kaye (707) 678-1368.

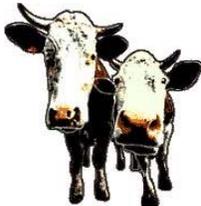
November 3
 Designing and installing a solar electric power system, workshop
 Location: Nevada County Superintendent of Schools, Houser Room
 Nevada City Hwy., Nevada City.
 \$75 per person, \$125 per couple, contact Sierra Solar Systems to register at (800) 735-6790

November 14-16
 California Cattlemen's Association Annual Convention
 Location: Hilton Hotel in Burbank, California
 \$45 per person registration, contact Kimberly Bradley at (916) 444-0845

December 4
 Erosion and Sediment Control: CPESC Training Course
 Location: Da Vinci Building, 1632 Da Vinci Ct., Davis, California
 \$185 per person registration, call (800) 752-0881 or go online at www.universityextension.ucdavis.edu
 and register for course section 012AGR142

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