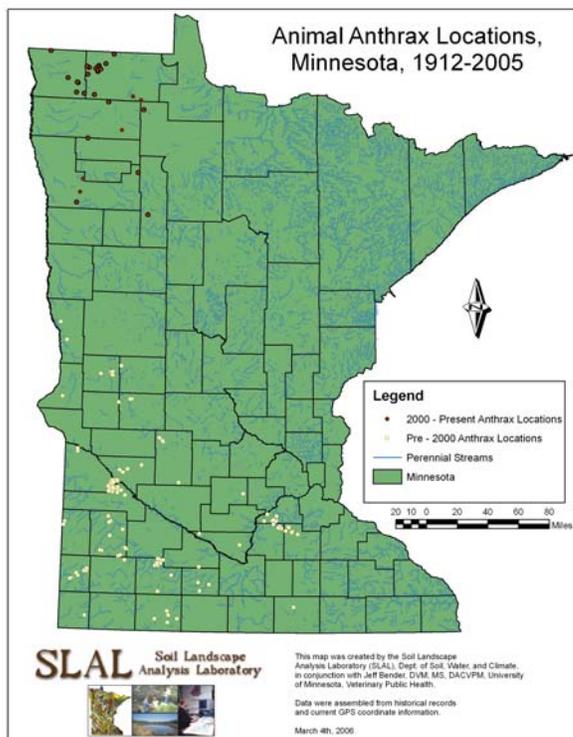


Anthrax in Minnesota

Anthrax is an infectious disease of both human beings and animals caused by the bacteria *Bacillus anthracis*. Anthrax has been reported worldwide and in nearly every state in the United States. Minnesota's last reported human case was in 1953.

In Minnesota, anthrax has been diagnosed more than 256 times on 189 farms since 1911. More recent anthrax outbreaks have been reported in 1969, 1984, 1993, 1996, 1997, 2000, 2001, and 2005. Most of the Minnesota farms that have had animals diagnosed with anthrax are in southwestern Minnesota, near the Minnesota River. Heavy rainfall with flooding followed by periods of dry weather likely has contributed to these outbreaks.

The 2005 outbreak involved Polk and Roseau counties. The 2001 outbreak involved Roseau, Kittson, Polk, and Marshall counties in northwestern Minnesota with 93 cattle, 2 horses, and 2 free-ranging white-tailed deer deaths reported. There were no human cases. Anthrax had not been diagnosed in any of these counties before 2000 and prior flooding may have introduced the *B. anthracis* organism into these new areas of Minnesota.



What is Anthrax?

B. anthracis is a spore-forming bacterium that grows within the body tissues of the animal/ human host. Spores develop when the organism is exposed to the atmosphere. Consequently, *B. anthracis* spores found in the soil are resistant to drying and UV light and may remain viable in the soil for decades.

The bacillus produces an exotoxin with at least three active protein factors: edema factor, lethal factor and protective antigen. These three proteins in concert are responsible for the lesions, illness, and possible deaths in both animals and humans.

How do animals become infected?

Most animals, particularly cattle and sheep, are infected while grazing contaminated anthrax areas. Flooding can contaminate low-lying areas. In Europe and Canada, pastures have been contaminated after flooding with waste from tanneries. Also, the consumption of inadequately processed, contaminated feedstuffs of animal origin, such as bloodmeal or bonemeal, has been implicated as a cause of anthrax outbreaks.

Ruminants (i.e. cattle, sheep, and goats) are the species most commonly affected with the peracute (severe illness in a short time) form of the disease where death may occur without warning. It is often reported as a "lightning" death.

The second form (acute or subacute anthrax) may result in fever, depression, convulsions, and dyspnea (difficulty in breathing). Death occurs approximately 24 hours after the initial signs of illness. Animals may hemorrhage from the mouth, nose and anus. Cattle, sheep, and horses are the most commonly affected animals with this form of anthrax.

Chronic anthrax presents as lingual and pharyngeal (throat) tissue swelling. Death can be caused from suffocation. This form of illness has been reported most often in swine, but also occurs in horses and dogs.

How do people become infected?

Anthrax is a disease of humans as well as animals. In humans there are three forms of the disease: cutaneous, inhalation, and intestinal. Cutaneous or skin anthrax, the most common human disease form, results when the organism enters broken skin. Cutaneous anthrax accounts for nearly 90 percent of all reported cases. Two to five days after the spore gets into a wound, a reddened, papular lesion develops, which commonly is mistaken for an insect bite. Later, a blister forms that becomes a depressed, black lesion (eschar). With antibiotic treatment, deaths from cutaneous anthrax are rare. However, without treatment, up to 20 percent of affected individuals may die.

The inhalation form of anthrax is rare and is caused by the inhalation of spores from contaminated dust, wool, or hair. This form has been documented in workers in wool or hair processing mills. Despite treatment, death is the usual outcome.

The third form is intestinal anthrax caused by the consumption of inadequately cooked meat or other animal products from anthrax-infected animals. There have been no reported cases of intestinal anthrax in the United States. Epidemics of the intestinal form have been reported in Third World countries. Again, death is the usual outcome from this form.

How can you prevent getting anthrax from locally processed cattle or wildlife?

It is important that diseased, dying, and dead animals not be processed for human consumption. Animals with anthrax will be ill with a high fever. Therefore, the best way to prevent anthrax from getting into the food chain is by inspecting animals before and after slaughter (ante mortem and postmortem inspection). At many meat and poultry slaughter facilities, state and federal inspectors perform these inspections. For locally processed meat, a veterinarian or skilled butcher can be helpful in identifying diseased animals that should not be processed and consumed. Producers that have had anthrax identified on their premises need to watch for sudden death or acute illnesses in their livestock. If suspicious cases are observed, producers need to contact their veterinarian immediately. In Minnesota, bear and deer hunters should follow the same precautions, especially in permit area 12 and the northwestern part of the “no-quota” area in Roseau, Lake of the Woods, and Kittson counties.

Should people be vaccinated?

A human anthrax vaccine is manufactured in the United States. This is a cell-free filtrate vaccine, meaning that it contains no dead or live bacteria. Official guidelines on who should receive vaccination include individuals who work directly with *B. anthracis*, who handle potentially infected animal products from high incidence areas (incidence is considered low in the United States), and military personnel deployed to areas with high risk for exposure. Vaccination may be part of a treatment regimen for individuals exposed to *B. anthracis*.

How can we prevent the spread of anthrax?

Anthrax is a reportable disease in Minnesota. Confirmed or suspicious cases of anthrax must be immediately reported by telephone to the Minnesota Board of Animal Health (MBAH) at 651-296-2942. MBAH veterinarians investigate all anthrax outbreaks and assist local practitioners in carrying out the MBAH rules.

When *B. anthracis* is exposed to oxygen, the organism transforms to a spore. Spores are resistant to temperature extremes, chemical disinfectants, and desiccation.

Animals that have died from anthrax should not be opened and should be burned under the supervision of a MBAH veterinarian.

Anthrax carcasses cannot be moved over public highways. If an animal is diagnosed with anthrax, all animals on that farm will be placed under quarantine for 30 days after the last animal has died. Animals should be removed from potentially contaminated pastures and vaccinated with an approved vaccine under MBAH staff supervision. Symptomatic animals should be treated with antibiotics (penicillin or oxytetracycline) and re-vaccinated in two weeks. On anthrax-contaminated premises, it is recommended that cattle be vaccinated annually, preferably during the spring, for a period of five years after the most recent anthrax outbreak. It is important to observe the recommended withdrawal period for meat and milk after antibiotic treatment or vaccination.

Human exposure issues

Minnesota Department of Health officials can be contacted at 612-676-5414 regarding human exposure and illness questions.

This fact sheet provides general information. Please contact your physician or veterinarian for specific information related to you or your animals.

For more information go to:

- **Centers for Disease Control and Prevention. Anthrax, Frequently Asked Questions. 2001.**
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/anthrax_g.htm
- **Department of National Resources Information Center, St. Paul, MN.**
<http://www.omfp@dnr.state.mn.us>
- **Dixon TC, Meselson M, Guillemin J, Hanna P. Anthrax, review article. *New England Journal of Medicine*. 1999;341:815-26.**
- **Turnbull P, Bohm R, Chizyuka GB, Fujikura T, Hugh-Jones ME, Melling J. Guidelines for the surveillance and control of anthrax in humans and animals. World Health Organization, 1993.**
<http://www.who.int/emc-documents/zoonoses/docs/whoemczi986.html>
- **Whitford HW and Hugh-Jones ME. *Anthrax*. 1994. CRC Press, Inc.**
- **Minnesota Board of Animal Health:**
http://www.bah.state.mn.us/diseases/anthrax/anthrax_prgm.htm

For clarification of information presented on this fact sheet, email cahfs@umn.edu. Updated: 7/7/06