



Common name

anthrax

Scientific name

a spore-forming bacterium, *Bacillus anthracis*

What's Bugging Wild Critters?

Fact sheet #5:
Anthrax

Anthrax

(*Bacillus anthracis*)

in Alberta

Significance

This disease causes sudden death in a variety of wildlife species. Recent outbreaks in western Canada have involved bison (with limited spillover into moose and black bears) and cattle. Human infection is rare.

What? Where? How?

Anthrax is an acute infectious disease. All warm-blooded animals (birds and mammals) are susceptible, some more so than others. Anthrax is fatal in most herbivores. Infected carcasses bloat very quickly and black tarry blood or blood-stained fluids may ooze from natural body openings. Although relatively resistant, carnivores can be infected if they eat enough infected meat. Swelling around the throat may occur in infected carnivores. Once an animal is infected, death occurs in a matter of a few hours or days, regardless of species. Clinical signs are minimal and generally carcasses are the first indication of a problem.

Transmission Cycle

Spores can survive in soil for long periods, possibly hundreds of years. Although specific conditions that activate dormant spores are poorly known, outbreaks often are associated with rainy spring weather followed by a hot dry summer. Localized floods or periodic flooding of low-lying areas also may expose and concentrate spores, particularly in bison wallows.

Transmission generally involves intake of spores via contaminated food, water, or

air. Rolling in their wallows or kicking dust onto themselves may be a common mechanism for aerosol transmission to bison. Biting flies that feed on carcasses may pick up bacteria from the blood, and non-biting flies may transfer spores on their feet from carcasses to vegetation.

Once in a susceptible host, the deadly spores germinate and develop a protective coating that provides protection from the host's immune system. They then produce a toxin that causes localized accumulation of tissue fluids (oedema), an excellent habitat for more bacteria. Rapid multiplication and bacterial showers into the blood result in toxic shock and rapid death of the host.

Fortunately, bacteria within the carcass cannot sporulate (become spores), and they die in rotting carcasses within 3-4 days. However, if exposed to air, the bacteria quickly sporulate and become a source of future infections. Carnivores play an important role in opening carcasses and contaminating the death site with spores. Rarely, migratory birds may transfer spores on their feet or feathers.

Distribution in Alberta

Anthrax occurs occasionally in bison in and around Wood Buffalo National Park (WBNP) and in cattle in central Alberta. The latest outbreaks also included spillover into a few black bears and moose. Recent cases in cattle occurred in 1974, 1981, 1991 and 1999. Additional cases occurred in bison in the Mackenzie Bison Sanctuary, NWT in 1993.



Anthrax in Alberta

(*Bacillus anthracis*)

Importance for Wildlife Management

Outbreaks of anthrax are relatively rare and tend to remain localized in small pockets. As such, mortality is low and unlikely to affect overall population levels.

Public Significance

Infection in humans is rare but can happen after inhalation of spores or direct entry of spores through superficial wounds in the skin when handling infected carcasses. Symptoms usually occur within seven days and differ depending on the route of infection. Skin infections are associated with a raised itchy lump (like a mosquito bite) that develops into a fluid-filled blister and then a painless ulcer 1-3 cm in diameter with a black necrotic (rotten) core. Inhalation is associated with flu-like symptoms that progress after several days to breathing difficulties and shock. Anyone exhibiting these symptoms after contacting a suspect carcass should consult a physician immediately. Antibiotic treatment is effective.

Infected animals die rapidly and it is highly unlikely that one would be taken by a hunter. Further, the rapid putrefaction of carcasses would lead the hunter to contact appropriate authorities to determine whether the meat was safe to eat, or to request a replacement tag.

Summary

Anthrax within free-ranging wildlife in Alberta, exclusive of bison, is extremely rare and only occurs in conjunction with outbreaks in bison or cattle. Anthrax cases generally occur between late June and early September, in northern and west central regions of Alberta. Human cases are extremely rare but precautions are warranted in all suspect situations.

Additional Information

Infectious Diseases of Wild Mammals, Third Edition. Edited by Elizabeth S. Williams and Ian K. Barker. 2001. Chapter 23 - Anthrax.

Alberta Fish and Wildlife: <http://www3.gov.ab.ca/srd/fw/diseases/pdf/anthrax.pdf>

Alberta Agriculture, Food and Rural Development: <http://www1.agric.gov.ab.ca/app21/rtw/selcat.jsp>

Canadian Food Inspection Agency: <http://www.inspection.gc.ca/english/index/ahsae.shtml>

Northwest Territories RWED: <http://www.nwtwildlife.com/Publications/diseasepamphletweb/anthrax.htm>

Infection in cattle can cause significant mortality in local herds. Quarantine and decontamination are essential elements of federal programs aimed at limiting confirmed outbreaks.

Generally, suspect carcasses should be flagged and the location documented. The carcass should not be disturbed. The public should contact appropriate authorities immediately. In WBNP, contact park staff; elsewhere in Alberta, contact a federal veterinary office or any office of the Fish and Wildlife Division.

For persons taking diagnostic samples, any suspect carcass should be approached and handled with extreme care. Protective clothing, including gloves, eye wear, and a face mask should be used. **DO NOT OPEN OR MOVE THE CARCASS.** Treat all diagnostic materials as a biohazard and triple bag and tag accordingly. Thoroughly disinfect or burn anything contaminated with blood or fluids from a suspect carcass.

Prevention/Control

There are no means of preventing anthrax outbreaks. WBNP and the Government of the Northwest Territories have in-depth surveillance and control programs that are applied in areas with a recent history of anthrax. Carcasses may be burned, buried, or doused with formaldehyde to minimize scavenging. Anthrax is a federal reportable disease and specific control programs are applied whenever anthrax is confirmed in domestic or captive animals.