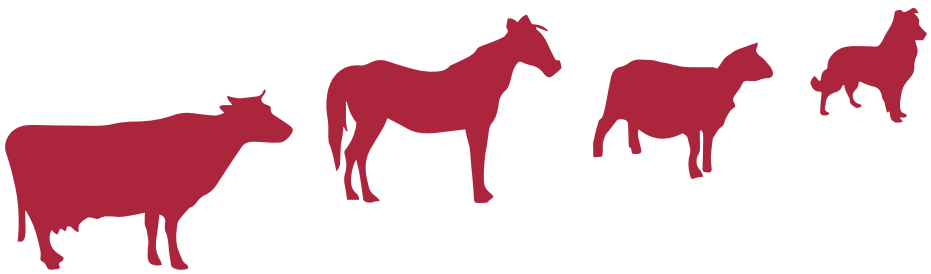
Anthrax

General Disease Information Sheets

What is Anthrax?

Anthrax is a disease caused by the spore-forming bacteria *Bacillus anthracis*. The name of the bacteria derives from the Greek word for coal, because of the ulcers with dark centers that develop on the skin of affected people. Anthrax occurs on all the continents, causes acute mortality in ruminants and is a zoonosis (a disease which primarily affects animals, but causes disease in humans). The bacteria produce extremely potent toxins which are responsible for the ill effects, causing a high mortality rate. While most mammals are susceptible, anthrax is typically a disease of ruminants and humans.



Where is the disease found?

Anthrax is found all over the world on all continents except Antarctica. There are endemic areas with more frequent outbreaks, other areas are subject to sporadic outbreaks in response to unusual weather patterns which can cause spores that were dormant in the soil to come to the surface where they are ingested by ruminants, germinate and cause illness.

How is the disease transmitted and spread?

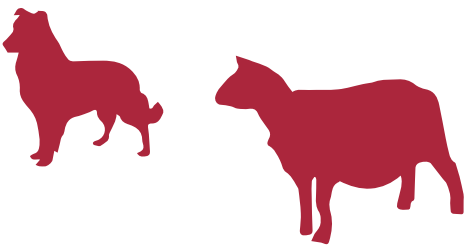
Anthrax does typically not spread from animal to animal nor from person to person. The bacteria produce spores on contact with oxygen. These spores are extremely resistant and survive for years in soil, or on wool or hair of infected animals. Then if ingested or inhaled by an animal, or on entering through cuts in the skin, they can germinate and cause disease. Because the blood of infected animals sometimes fails to clot and may leak from body orifices, insects can spread the bacteria to other animals. Carnivores and humans can become infected by eating meat from an infected animal. But typically animals become infected by ingesting spores which are in the soil or in feed.

What are the clinical signs of the disease?

Ruminant animals are often found dead with no indication that they had been ill. In this acute form there may be high fever, muscle tremors and difficult breathing seen shortly before the animal collapses and dies. Unclotted blood may exude from body openings and the body may not stiffen after death.

In horses or sometimes in ruminants there may be digestive upsets and colic, fever, depression and sometimes swelling. These symptoms may last for up to four days before death results.

In carnivores when the animal feeds on an infected source there may be an intestinal form of the disease with fever and cramps from which animals sometimes recover.

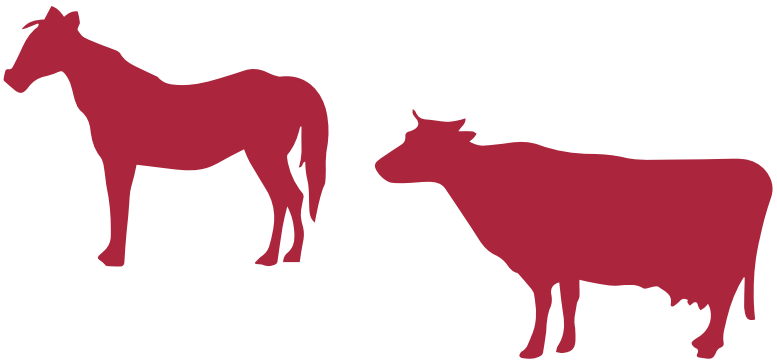


How is the disease diagnosed?

Anthrax is diagnosed by examining blood (or other tissues) for the presence of the bacteria. Samples must be collected carefully to avoid contamination of the environment and to prevent human exposure to the bacteria. Blood samples from relatively fresh carcasses will contain large numbers of *B. anthracis*, which can be seen under a microscope, cultured and isolated in a laboratory, or detected by rapid tests, e.g. polymerase chain reaction (PCR). The OIE *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals* describes both the laboratory procedures to detect anthrax and the accepted methodology for production of vaccines.

What is the public health risk?

In humans anthrax manifests itself in three distinct patterns. The most common is a skin infection, where people become infected handling animals or animal products that contain spores. This can happen to livestock producers or butchers dealing with sick animals, or when infection has been spread by wool or hides. The spores enter the body through cuts or scratches in the skin and cause a local infection that if not controlled may spread throughout the body. The digestive form occurs when the spores are eaten. Tragically people who lose their animals may also lose their lives trying to salvage something and consuming the meat from an animal that died. Potentially the most deadly form is by inhalation. This has been called‘wool sorters disease’ since spores on hides or hair could be inhaled. While inhalation anthrax is rare in nature, anthrax spores have been developed and used as a biological weapon. Clearly, preventing the disease in animals will protect human public health.



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What is being done to prevent or control this disease?

Anthrax is a disease listed in the World Organisation for Animal Health (OIE) *Terrestrial Animal Health Code* and must be reported to the OIE (OIE *Terrestrial Animal Health Code*).

In addition to antibiotic therapy and immunization, specific control procedures are necessary to contain the disease and prevent its spread. In particular:

- the proper disposal of dead animals is critical;
- the carcass should not be opened, since exposure to oxygen will allow the bacteria to form spores
- premises are to be quarantined until all susceptible animals are vaccinated and all carcasses disposed of preferably by incineration or alternatively by deep burial with quick lime.
- cleaning and disinfection are important as is control of insects and rodents.

Vaccination in endemic areas is very important. In fact effective vaccination against anthrax was first demonstrated by Louis Pasteur in 1881.The OIE spells out the requirements for the manufacture and quality control of animal vaccines, in the OIE *Manual of Diagnositc Tests and Vaccines*. Although vaccination will prevent outbreaks veterinary services sometimes fail to vaccinate when the disease has not appeared for several years. But because the spores survive for such lengthy periods, the risk is always present.

Though anthrax is quite susceptible to antibiotic therapy, the clinical course is often so rapid that there may not be the opportunity to treat affected animals. Early detection of outbreaks, quarantine of affected premises, destruction of diseased animals and fomites, and implementation of appropriate sanitary procedures at abattoirs and dairy factories will ensure the safety of products of animal origin intended for human consumption.

More Information?

References:

1. OIE *Terrestrial Animal Health Code:*
   www.oie.int/en/international-standard-setting/terrestrial-code/access-online/

2. OIE *Manual of Diagnostic Tests and Vaccines for Terrestrial Animal:*
   www.oie.int/en/international-standard-setting/terrestrial-manual/access-online/

3. OIE Technical Disease Card:
   www.oie.int/en/animal-health-in-the-world/technical-disease-cards/

4. The Center for Food Security and Public Health, Iowa State University
   www.cfsph.iastate.edu/

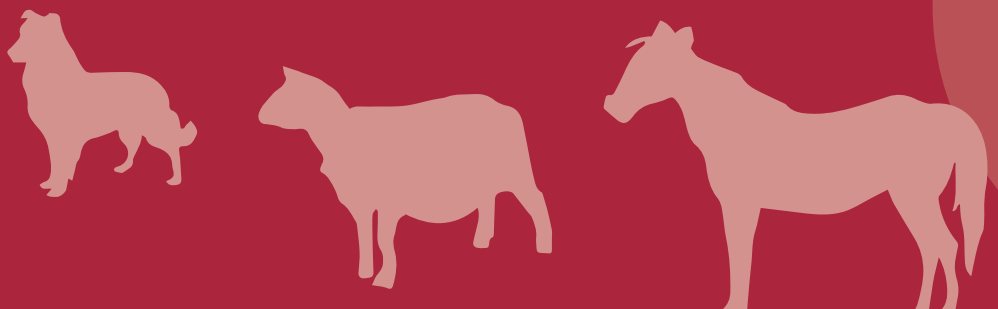
5. Merck Veterinary Manual:
   www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/toc_50000.htm

6. *Atlas of Transboundary Animal Diseases Animales Transfronterizas*
   P. Fernandez, W. White; Ed.: 2011

Ask our experts:

List of Reference Laboratories:
www.oie.int/en/our-scientific-expertise/reference-laboratories/list-of-laboratories/

List of Collaborating Centres:
www.oie.int/en/our-scientific-expertise/collaborating-centres/list-of-centres/



Key Facts

- Anthrax spores in the soil are very resistant and can cause disease when ingested even years after an outbreak. The spores are brought to the surface by wet weather, or by deep tilling, and when ingested by ruminants the disease reappears.

- In 1881 Louis Pasteur was first able to demonstrate that vaccination could prevent disease. Today vaccines are produced under OIE guidelines found in the *Manual of Diagnostic Tests and Vaccines for Terrestrial animals*.

- Anthrax has been developed and used as a biological weapon. The existing OIE international standards provide a firm basis on which to develop strategies for early detection, rapid response and transparency of information in the face of natural and intentional disease outbreaks.

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