

Primefact

Anthrax in livestock

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Animal Biosecurity, NSW DPIRD

Anthrax is a zoonotic disease and is prohibited matter in NSW.

What is anthrax?

Anthrax in livestock is a serious, usually fatal disease caused by the bacterium *Bacillus anthracis*. It occurs world-wide and can infect a wide range of domestic and wild animal species as well as humans.

In grazing livestock anthrax usually presents as the sudden death of one, or a group of animals in a mob. Affected stock generally show few or no signs of ill health before they die. In some situations, the disease may begin with the sporadic deaths of single animals over a few days, building to dramatic losses in a very short time.

Anthrax can kill stock of any age or class with no warning. All cases of sudden unexplained death in livestock should be reported to a Local Land Services (LLS) District Veterinarian so that anthrax can be ruled out.

Anthrax is treated very seriously in Australia because of its risk to human and animal health, export markets and farm productivity. It is a notifiable disease in NSW.

Occurrence of anthrax in NSW

Anthrax was first recognised in Australia in 1847 in the County of Cumberland ('Cumberland disease') and caused significant losses in parts of New South Wales in the 1800s.

Cases of anthrax tend to occur in an area which runs through the centre of New South Wales and into Victoria. In NSW the area lies approximately between Bourke and Inverell in the north to Albury and Deniliquin in the south. The incidence of anthrax in NSW is very low.

Anthrax survives for long periods in the environment by forming tough spores which lie dormant in the soil. Its re-appearance is unpredictable. It can recur more than 50 years after the last known case in a district. An example of this is the serious incident which occurred in 2007 in the NSW

Hunter Valley where anthrax had not been seen for over 60 years. It is essential that all stock owners in New South Wales remain aware of the disease and report all suspicious livestock deaths.

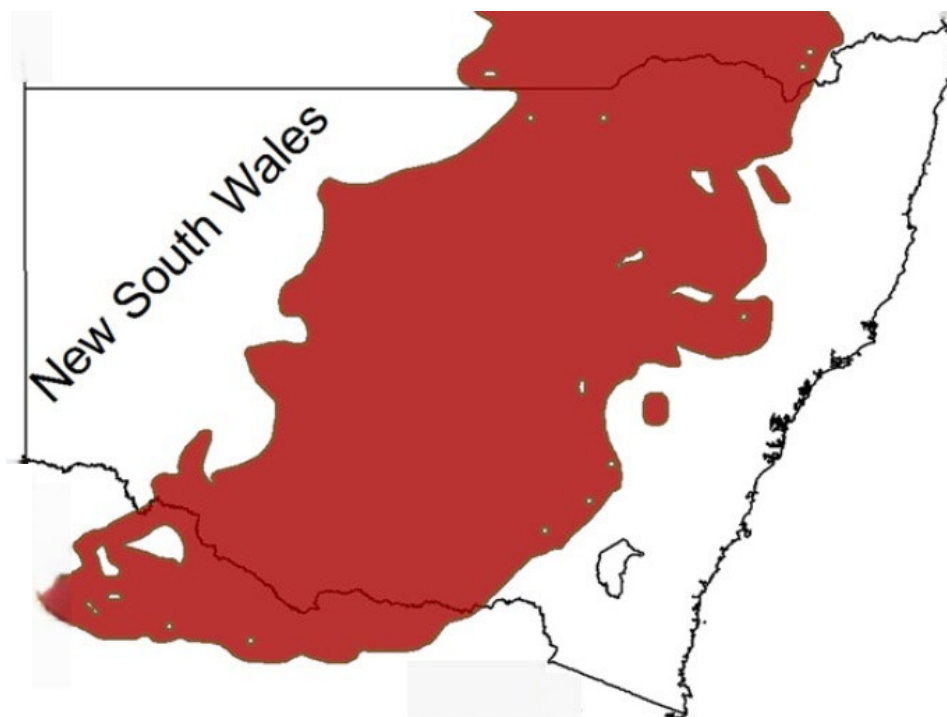


Figure 1 - Anthrax in NSW – ecological niche modelling has defined the anthrax belt¹

Legal obligations

Anthrax is a notifiable disease

Anthrax is a prohibited matter and a notifiable disease under the *Biosecurity Act 2015* (the Act). If you think that anthrax may be affecting your animals, you have a legal responsibility to immediately notify an authorised officer under the Act. Contact your [Local Land Services](#) (LLS) office or call the Emergency Animal Disease Hotline on 1800 675 888.

General biosecurity duty

A key objective of the Act is to promote biosecurity as a shared responsibility between government, industry and communities. Under the Act, any person (e.g., stock owner or manager, agent, veterinarian, etc) who deals with potential anthrax carriers such as grazing livestock, or other associated carriers (e.g., soil, equipment) and who knows or ought to know of the biosecurity risks associated with anthrax has a **general biosecurity duty** to take measures to prevent, eliminate or minimise the risk as far as is reasonably practicable.

Potential ways to discharge your general biosecurity duty will include:

- actions to minimise stock becoming infected e.g., vaccination of livestock for at least three years after anthrax is diagnosed on a property.

- regular monitoring of animals for signs of disease, particularly during periods of heightened risk
 - immediate notification of suspected disease
 - isolation of a potentially infected animal, carrier or property
 - disinfection of potentially infected items
 - making and maintaining records to assist in disease tracing.
 - appropriate disposal of potentially infected things e.g., of infected carcasses.
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Risk factors for anthrax

Most cases of anthrax diagnosed in NSW involve sheep or cattle, but there have been occasional historical reports of pigs affected. Goats and horses have rarely been affected. Carnivores such as dogs and cats are highly resistant to anthrax.

There are no firm guidelines for what constitutes an anthrax risk period, but the following general principles apply:

- Infection of ruminants is usually via the oral route (by mouth), so anything that increases the chance of soil containing anthrax spores being ingested is a factor. For example:
 - deep cultivation of paddocks
 - earthworks in paddocks
 - grazing of stubbles or very short pastures
 - low ground cover e.g., during drought
 - heavy rain causing movement of soil or exposure of old anthrax grave sites.
 - contact with infected carcasses.
 - Moderate rainfall following prolonged dry periods.
 - Alkaline soils which favour spore survival.
 - History of anthrax on the property.
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Development of the disease

Grazing animals become infected by consuming the spores of anthrax while feeding. The spores germinate into the active form of the bacterium and begin to multiply rapidly inside the animal. Within a few days the animal's immune system is overwhelmed, and masses of bacteria and their toxins are released into the bloodstream causing sudden death.

Carcasses of animals that have died from anthrax are full of infectious bacteria. A feature of anthrax infection is failure of the blood to clot, so after death blood and body fluids ooze from body orifices and sites of predation on an infected carcass. These fluids contain many anthrax bacteria which form resistant spores as soon as they are exposed to the environment outside the carcass.

Spores are the 'resting' form of the anthrax bacterium. They have a tough shell which makes them highly resistant to environmental factors such as heat and sunlight, dryness and other factors which would kill the bacterium in its 'active' form. Spores can survive in the soil for many years, waiting for conditions to be suitable for them to gain entry to an animal and cause disease.

Signs of anthrax in animals

Be suspicious of anthrax if animals die suddenly and one or more of the following occur:

- Blood oozes from one or more body orifices (e.g., eyes, nose, anus, udder) or sites of predation.
- Blood from the carcass does not clot.
- There is a history of anthrax at any time on the property.
- The property is located within the central part of NSW where most cases of anthrax occur.

Grazing animals are generally found dead, often with blood seeping from the carcass. Closely observed animals like dairy cows may be noted to be depressed and show signs of fever followed by a drop in milk production prior to death.

Horses usually die suddenly and show swelling of the body and legs but may linger for a few days with colic and body swelling before dying.

Pigs may develop localised infection in the throat which leads to obvious illness and fever lasting two to seven days before they die.

Dogs and cats are highly resistant but should be monitored carefully if they have had access to infected carcasses.



Figure 2 – A sheep and cow that have died from anthrax. Note blood dripping from eyes, nostrils, and mouth.

Diagnosis of anthrax

The carcass of an animal which has died of anthrax is an extreme infection risk to people and other animals. If you suspect an animal has died of anthrax report it immediately and **do not handle, open or skin the carcass**. Do not move the carcass. Keep all other animals away from it.

A veterinarian or an authorised officer under the Act will investigate suspect cases of anthrax. If suitable samples are available, they can be tested on-farm using the Anthrax ICT test kit. This test gives a result in fifteen minutes. If samples for the ICT test are not available, smears of blood and a piece of the animal's ear will be collected for examination at the laboratory.

Do not perform a post-mortem examination.



Figure 3 – Positive Anthrax ICT test on-farm

Anthrax in humans

Anthrax is a serious zoonosis, meaning that it can be transmitted from animal to humans.

The greatest risk of contracting anthrax in Australia for people is from handling the carcasses of animals which have died from anthrax. Anyone who thinks they may have been exposed to anthrax infected livestock or materials should seek medical advice immediately.

When anthrax is diagnosed in animals in NSW the appropriate public health units are notified, and they provide advice to any people who have been in contact with livestock on the affected property. You can access the [NSW Health Anthrax fact sheet](#) for more information or contact [NSW Public Health](#) (1300 066 055) directly for advice on the risks to humans.

Anthrax vaccine is used to protect livestock from infection in NSW. Although the strain of anthrax used in the vaccine is not known to cause infection in people, extreme care should be taken when using the vaccine. Accidental self-injection with anthrax vaccine can cause an inflammatory reaction and medical advice should be sought immediately.



Figure 4 – Anthrax infection in humans – skin lesion

Prevention of anthrax

There is a vaccine available to protect livestock from anthrax. Anthrax vaccination should be considered on all properties where the disease has occurred, even if it was a long time ago. It may also be considered on properties where anthrax is not known to have occurred, particularly when it is considered a high-risk period.

Vaccination provides effective protection against anthrax when the manufacturer's directions are followed. Details on how to order the vaccine are available on the NSW DPIRD [anthrax website](#).

Management of anthrax cases

When anthrax is diagnosed in NSW the case will be managed by a Local Land Services District Veterinarian.

Comprehensive information on what happens after anthrax diagnosis can be found in the [Anthrax procedure](#).

More information

For more information on anthrax:

- contact your [Local Land Services](#) District Veterinarian – 1300 795 299
 - see: <http://www.dpi.nsw.gov.au/biosecurity/animal/humans/anthrax>, or
 - see the [AUSVETPLAN Anthrax manual](#) for detailed technical information on anthrax and Australia's national policies for anthrax management.
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1. Barro AS, Fegan M, Moloney B, Porter K, Muller J, Warner S, et al. (2016) Redefining the Australian Anthrax Belt: Modeling the Ecological Niche and Predicting the Geographic Distribution of *Bacillus anthracis*. PLoS Negl Trop Dis 10(6): e0004689. doi:10.1371/journal.pntd.0004689
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