

DPI Primefact

Anthrax diagnosis – information for veterinarians

February 2024, Primefact PUB17/48[v2], second edition
NSW DPI - Animal Biosecurity

Anthrax is a notifiable disease

Anthrax is listed as prohibited matter and is a notifiable disease under the *Biosecurity Act 2015* (the Act) because of the potential danger it poses to people, other livestock and the possible impact on Australia's export markets.

If you suspect an anthrax infection you have a legal responsibility under the Act, to immediately notify an authorised officer. This can be done by contacting your Local Land Services District Veterinarian or the Emergency Animal Disease Hotline on 1800 675 888 with details of the case, including the Property Identification Code (PIC) and owner details.

Veterinary investigation is required

Do not perform a post-mortem examination.

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. Advise the producer to keep other animals away from it.

An investigation must be undertaken to confirm or exclude anthrax as the cause of death. This may be carried out by any veterinarian, or an authorised officer under the Act.

If a suitably fresh sample is available, it can be tested on farm using the Anthrax ICT test kit. If the test kit is not available, or fresh samples are not available, the investigator can collect smears of blood and a piece of the animal's ear for submission and examination at the laboratory.

Further information for investigating veterinarians is available in the [Procedure – Anthrax](#).

Personal Protective Equipment

Anthrax is a zoonotic disease – if you or another person has had contact with an anthrax infected carcass or product you should immediately contact their General Practitioner or local public health unit ([NSW Public Health](#), 1300 066 055) for advice.

Appropriate Personal Protective Equipment (PPE) must be used (gloves and clothing), and skin breaks covered. Additional PPE can be used which could include safety glasses (protects from splashes) and respiratory protection (protects where possibility of inhalation exists).

All work should be undertaken in a manner that reduces the likelihood of creating aerosols or dust around the carcass.

Handling infected materials

People handling carcasses, tissues or body fluids of animals known or suspected of being, infected with anthrax should:

- avoid creating aerosols or dust
 - cover cuts or abrasions with a dressing
 - not eat, drink, or smoke while working
 - use PPE
 - burn items contaminated with body fluids after use
 - shower in warm soapy water when work is completed.
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Diagnosis

Diagnosis of Anthrax is supported by history, clinical signs and the use of an Immunochromatographic test (ICT) in the field. Confirmation is by smear examination and PCR in the laboratory. If the ICT test is used, samples must still be submitted to the laboratory for confirmation.

Use of Anthrax ICT kits

The anthrax immunochromatographic antigen detection assay (ICT) is produced by the national Anthrax reference laboratory and the NSW Department of Primary Industries (NSW DPI) provides it free of charge to private veterinarians working in districts where anthrax exclusions are regularly conducted.

Private veterinarians should contact their Local Land Services District Veterinarian (LLS DV) who will conduct training in the use of the ICT. Once trained, private veterinarians may order the ICT test kit through their LLS DV.

When to use the kits

- The ICT should be used at the carcass side where there is sudden unexplained death.
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- The ICT should not be used on live animals.
- The ICT is highly sensitive when used on cattle and sheep carcasses that are less than 48 hours old (not live animals).
- If a carcass is more than 48 hours old, or the test has been used on another species, the kit can still be used but any ICT negative result must be confirmed by laboratory testing.

Detailed instruction on the use the kits are provided in the Anthrax ICT Standard Operating Procedure which is attached as an appendix to this Primefact.

Negative ICT result

If there is a negative ICT result and you no longer suspect Anthrax as a differential:

- continue with the investigation
- sample as appropriate for the differential diagnoses
- complete an ICT negative case report and submit to your LLS District Veterinarian. The District Veterinarian will record the negative ICT on the property record. **This is critical surveillance information to support trade and market access.**

Positive ICT result or remaining suspicion of Anthrax

If there is a positive ICT result, or you remain suspicious of Anthrax:

- Collect samples for submission to the NSW Animal and Plant Health Laboratories
 - Blood, or
 - Piece of ear
- Photograph the ICT results.
- Notify your LLS District Veterinarian or the Emergency Animal Disease Hotline and follow their advice.

Response to infection

If anthrax is diagnosed on a property a Local Land Services District Veterinarian will oversee management of the case as per the Procedure – anthrax management.

Steps undertaken will include:

- Liaison with NSW Health
- Restrictions on the movement of susceptible animals and their products
- Tracing recent movements of susceptible animals and their products on and off the property
- Immediate vaccination of remaining at risk stock
- Carcass disposal

- Decontamination of the site, clothing, machinery and equipment
 - Notification of neighbours
 - Ongoing monitoring of any mortalities
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More information

For more information:

- Contact your [Local Land Services](#) District Veterinarian – 1300 795 299
 - Visit <http://www.dpi.nsw.gov.au/biosecurity/animal/humans/anthrax>, or
 - See the [AUSVETPLAN - Anthrax Response Strategy](#) for detailed technical information on anthrax and Australia's national policies for anthrax management.
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Acknowledgements

The Anthrax program is a collaboration between the NSW Department of Primary Industries and NSW Local Land Services.

The attached standard operating procedure for the Anthrax ICT assay was supplied by the National Anthrax Reference Laboratory.

© State of New South Wales through Regional NSW 2024. The information contained in this publication is based on knowledge and understanding at the time of writing February 2024. However, because of advances in knowledge, users are reminded of the need to ensure that the information upon which they rely is up to date and to check the currency of the information with the appropriate officer of the Regional NSW or the user's independent adviser.

Standard Operating Procedure for the Anthrax ICT

Source:	National Anthrax Reference Laboratory Department of Energy Environment and Climate Change Agriculture Victoria 5 Ring Rd, Bundoora, Victoria 3083 Dr Janine Muller - Janine.muller@agriculture.vic.gov.au; 03 90327263 Mr Ilhan Mohammad - Ilhan.mohammad@agriculture.vic.gov.au; 03 90327261
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Sample collection

Preferred samples for diagnosis are blood from jugular, mammary, limb or other peripheral veins. If venous blood cannot be obtained without opening the carcass, then a sample can be collected from blood pooled in the nasal cavity.

Precautions & warnings

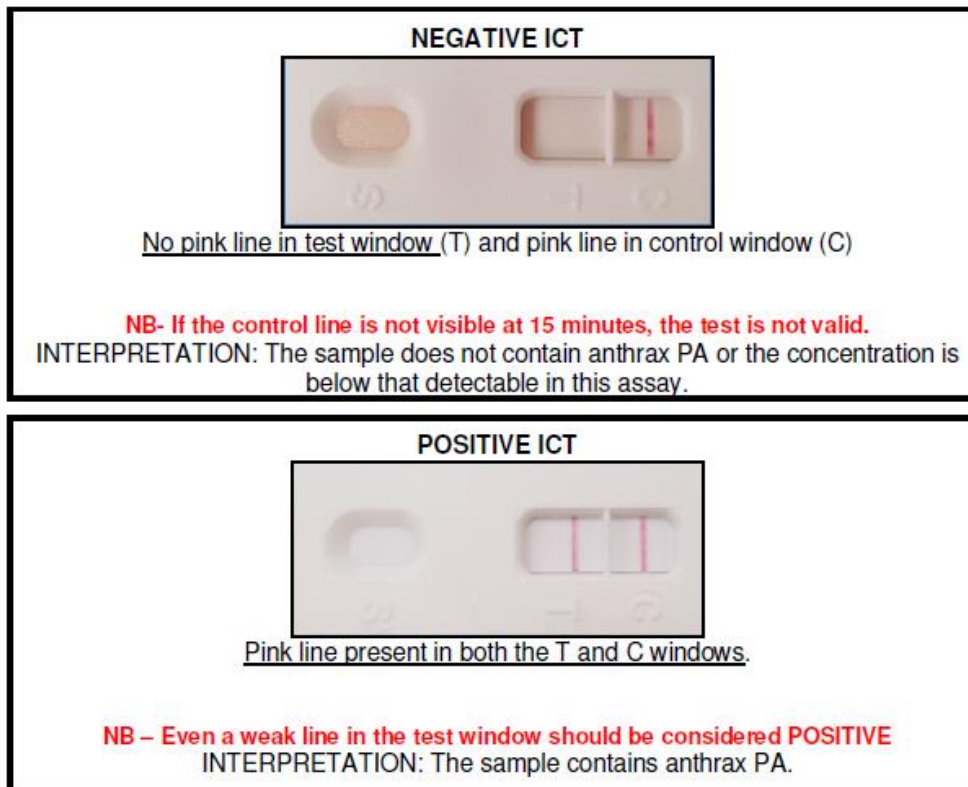
- The ICT should be used with caution on animals that are more than 48 h post-mortem
- The ICT and buffer must be kept refrigerated at 4°C or cool on ice within an esky during field transport.
- ICT kits should NOT be frozen.
- Appropriate PPE should be worn.

ICT technique and interpretation

1. Examine the ICT package to ensure it is within the expiry date and that the foil package is not torn or perforated. If the expiry date has been surpassed please contact the National Anthrax Reference Laboratory.



2. Allow the ICT and buffer to come to room temperature before use, this will take approximately 5 minutes.
3. Place 1 drop of blood or a swab dipped in blood into the 3mL of sample dilution buffer.
4. Replace lid on sample dilution buffer and mix.
5. Remove the ICT from the foil package (checking that the desiccants within the package are still blue) and fill the sample delivery well (marked "S" on the kit) with the sample using the disposable transfer pipette provided.
6. Allow 15 mins for the sample to move through the ICT before reading.
NOTE: A line may be visible prior to 15 mins.
7. Read the ICT result as shown in the figures below.



Waste disposal

In the case of a positive ICT result or where there is a high index of suspicion of anthrax, but a negative test result, the ICT, buffer mix, syringe/needle and gloves should be disposed of as per usual protocol for disposal of infectious biological waste.

ICT interpretation and reporting requirements:

In samples taken from animals and processed within 48 hours post mortem, the sensitivity of the test approaches 100% (95% CI 93.98-100%). On this basis, it is recommended that the ICT only be performed on samples from animals within 48 hours post-mortem. Where the test is used beyond 48 hours post-mortem, the sensitivity will decrease; however, any positive ICT can still be regarded as a true result.

Given that anthrax is a notifiable disease, any positive or equivocal result obtained from testing in the field should be immediately reported to the relevant authority. The result should also be confirmed using an approved laboratory method of diagnosis, preferably with the Anthrax National Reference Laboratory who will store the isolate in the National Reference Collection.

In the case of a negative result, appropriate samples for investigation of sudden or unexpected death should be submitted to a diagnostic laboratory to make a definitive diagnosis – accepting that it is highly unlikely that the cause of death was anthrax. Negative laboratory confirmation of anthrax would only be required if a risk assessment indicates that the case does not match the ICT result. Careful consideration and use of your State or Territory SOPs should then be instigated.