

## Biosecurity - Anthrax

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### Management of the biosecurity risk

Anthrax is a 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.

The purpose of this procedure is to set out how suspected or confirmed anthrax incidents in NSW animals or animal products should be managed.

The aim in managing these cases is to minimise risks to human and animal health, livestock industries, and trade associated with anthrax.

### Scope

The *Biosecurity Act 2015* (the Act) promotes biosecurity as a shared responsibility between government, industry and the community. This procedure is a State Priority for NSW and applies to the NSW Department of Primary Industries (NSW DPI), an office within the Department of Regional NSW, and Local Land Services (LLS).

Managing the risk of anthrax is a priority activity under the NSW DPI/LLS policy, Prohibited Matter – Pests and Diseases of Animals. This procedure has been jointly developed by NSW DPI and LLS and is based on an assessment of the risks associated with anthrax.

### Biosecurity legislation summary

Anthrax is listed as prohibited matter in Schedule 2 of the Act. The prohibited matter listing requires:

- people to immediately notify any suspect or known cases of anthrax to Local Land Services on 1300 795 299 or to the Animal Disease Hotline on 1800 675 888, and
- a person not 'deal with' prohibited matter, for example, a person must not sell or move stock if it is less than 20 days since the last death from anthrax without a permit.

Any person, such as a stock owner or manager, agent or veterinarian, 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 this biosecurity duty include:

- actions to minimise stock becoming infected e.g. vaccination of livestock for at least three years after anthrax is diagnosed
- regular monitoring of animals for signs of disease
- immediate notification of suspected disease
- isolation of a potentially infected animal, carrier or premises
- disinfection of potentially infected items



While handling potentially contaminated matter, appropriate PPE must be used (gloves and clothing), and protect skin breaks from exposure to potential contamination (WHO 2008). Additional PPE can be used which could include safety glasses (protects from splashes) and respiratory protection (protects where possibility of inhalation exists). Despite extensive exposure to anthrax carcasses, cases amongst wildlife workers are exceedingly rare (WHO 2008).

Medical advice should be sought if any of the following occur:

- a person feels unwell following handling carcasses known or suspected to be infected, or
- a person has had any exposure without appropriate PPE, or
- a person has had exposure to vaccine or infection through wounds, or
- a person has self-inoculated while animals are being vaccinated.

The chemicals used to destroy anthrax spores are potentially dangerous and should only be used by trained personnel in accordance with appropriate instructions and while wearing appropriate PPE. Safety data sheets must be available and consulted, prior to use.

Formalin and glutaraldehyde should only be used when no alternatives exist, and then only by experienced personnel using appropriate safety equipment.

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### 1. Reporting and notifying anthrax

A person, other than an authorised officer, who suspects an animal is infected with anthrax, must notify a NSW DPI or LLS authorised officer immediately. Notifications may be made by calling the local LLS office or the Animal Disease Hotline on 1800 675 888

Notifications of suspected Anthrax infection must be reported and assessed as per the Procedure Reporting notifiable pests and diseases of animals.

### 2. Technical information

Technical information about anthrax including clinical signs, epidemiology and sampling can be found at:

- NSW DPI anthrax [laboratory](#) page
- NSW [DPI anthrax page](#)
- [Anthrax AUSVETPLAN response policy brief](#)
- [WHO 2008- Anthrax in humans and animals.](#)

### 3. Preparedness

LLS District Vets (DV) must:

- regularly check local immunochromatographic test (ICT) supply – ensure kits are available and 'in-date'
- order new kits from State Veterinary Diagnostic Laboratory (SVDL) using the media request form

LLS team leaders and DVs:

- must ensure DVs and biosecurity officers who will conduct field investigations are trained in the use of the anthrax ICT kit
- may train local private practitioners in the use of the ICT kit, (training must include reporting requirements).

### 4. Investigation of suspect anthrax cases

Investigation of reports of livestock sudden death cases must be treated as a priority by LLS and conducted as per the Procedure for Prohibited Matter Animal Pest and Diseases Investigation and Alert Phase (except where a documented risk assessment supports variation). On receipt of a report of sudden death, the person in charge of the animals should be contacted by phone as soon as is practicable but no more than 12 hours after having received the report. If anthrax is suspected, relevant advice should be provided about removing stock from the paddocks, ensuring the carcass(es) is/are not predated and that people do not expose themselves to potential contamination. Enquiries regarding movements of stock in the last 20 days must be made.

If anthrax is suspected by the LLS veterinarian a field investigation must be undertaken as soon as possible, but no more than 24 hours following a report of sudden death. Field investigation may be conducted by an LLS veterinarian, a biosecurity officer under the supervision of an LLS veterinarian, or a private veterinarian under the supervision of an LLS veterinarian. An LLS veterinarian who is supervising an investigation by a biosecurity officer, or a private veterinarian, must ensure that the case is managed in accordance with the standards required by this procedure.

### 5. Diagnosis

Anthrax is often suspected based on the clinical history and appearance of a carcass. If the investigator suspects anthrax, the use of an Anthrax ICT test can rapidly provide valuable diagnostic information in the field.

## 5.1 Instructions for performing the anthrax ICT test

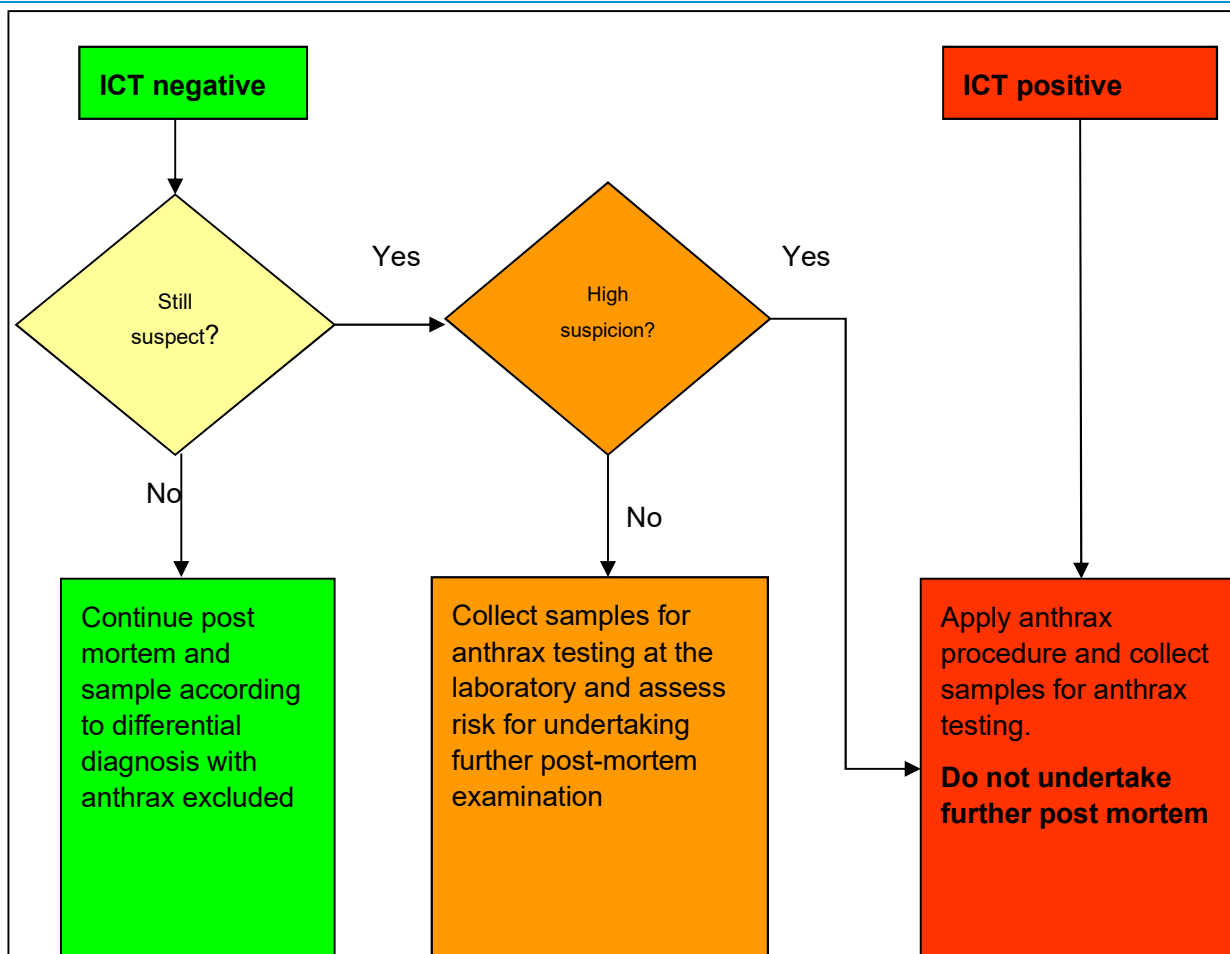
Perform the ICT as per the [SOP for Anthrax ICT](#). A negative ICT test must not override the investigator's clinical judgement.

If the investigator strongly suspects anthrax but the ICT test is negative, they must collect further samples for submission to the SVDL and not proceed with a post mortem examination. The case should be treated as though positive for anthrax until proven otherwise.

Key points about the ICT test:

- most reliable if collect samples from carcasses less than 48 hours old
- best samples are peripheral blood or aspirate from the jugular vein
- do not overload diluent solution with sample fluid when performing the test
- test detects antigen, with high sensitivity for species such as cattle and sheep with high terminal bacteraemia. Sensitivity in species such as goats and horses has not been determined.
- wait 15 minutes before declaring a test negative. Positive results may be obvious in a shorter time
- photograph the test kit result immediately after reading. In rare instances where the ICT and laboratory test results differ, the photograph is used to assist with investigations about the cause. In addition, the GPS coordinates of tested animals should be recorded in Livestock Health Management System (LHMS) manual If location is enabled on your mobile device, the photograph will have the GPS coordinates recorded. Further details are available in the LHMS manual.
- when the ICT is conducted by a private veterinarian with a negative result, LLS staff must obtain the ICT negative report from the private veterinarians and enter the results as described in the LHMS manual
- ICT positive test results must be confirmed at the laboratory
- negative results from carcasses older than 48 hours or from species other than cattle or sheep must be confirmed by additional laboratory testing.

Figure 1: ACTIONS FOLLOWING ICT RESULT



## 5.2 Laboratory testing for anthrax

Samples should be submitted to the SVDL when:

- ICT result does not correlate with veterinarian's assessment, or
- samples are from carcasses more than 48 hours old, or
- ICT test is positive.

The [NSW DPI laboratory services Anthrax page](#) sets out the preferred sampling protocol for laboratory investigation of anthrax. The preferred sample for diagnosis of anthrax is blood.

When investigating suspect anthrax cases investigators do not always have access to ideal samples.

Where possible try to include as many as possible of the following. Contact the SVDL on 1800 675 623 for advice if necessary.

### 5.2.1 Blood

- collect from a large peripheral or safely accessible vein or haemorrhagic exudate from orifices particularly the nasal cavity. The blood can be collected with a syringe and needle or dry swab.
  - make thin smears and
  - use to perform the ICT test in the field
- in the laboratory blood is used for PCR and culture (approved laboratories). Samples for culture are sent to the National Anthrax Reference Laboratory (NARL) when there are discrepancies between the ICT results and test results from the SVDL. In addition, for

confirmed cases, samples for culture are sent to the NARL for ongoing research on strains present in Australia.

### 5.2.2 Slides/smears

- **Note: one end & one side of the slide must be clear**
- Ruminants: Submit 2 labelled, thin, air dried blood smears from peripheral blood (eg. ear, leg or eye socket) from each animal
- Pigs: submit impression smears from affected tissues such as swollen pharyngeal lymph nodes obtained by aspirating fluid. If no fluid is obtained by aspiration, make an incision over the affected area and make smears of the surrounding fluid. As terminal bacteraemia in pigs is relatively low, blood smears are likely to be negative.
- Horses: Submit smears made from fluid present in oedematous fluids.
- Results will be available shortly after receiving smears from freshly dead animals at the laboratory. If significant putrefaction is noted on smears, PCR is routinely performed with results generally available late on the day samples were received.

### 5.2.3 Other samples

If the animal has been dead for some time, it may not be possible to obtain blood. Any of the following may be used for Polymerase Chain Reaction (PCR) testing:

- tissue or body fluids – liquid or on a swab
- small piece of tissue eg 2cm X 2cm piece of ear from a carcass.

PCR testing can be done on samples from aged carcasses. In practise the laboratory cannot test tissue samples that are dried. It is unlikely that samples from animals that have been dead for more than 2 weeks will be suitable for testing. If anthrax was the cause of death, it is likely there will be additional deaths and samples should be collected from recently dead animals.

### 5.2.3 ICT kit samples

Submit:

- ICT kits that have been used to test animals (labelled so it can be correlated with other samples)
- sample buffer (labelled so it can be correlated with other samples).

These samples will be used to investigate the causes of any discrepancy between the ICT and laboratory test results.

## 5.3 Gross pathology

In the event that a carcass is opened the following signs may be seen in an anthrax case:

- tarry, unclotted blood
- absence of rigor mortis
- swollen, haemorrhagic spleen (in cattle and sheep)
- oedematous mesentery with excess fluid in the peritoneal and pleural cavities and in the pericardial sac
- ecchymotic haemorrhages in organs
- dark red, oedematous and/or necrotic intestinal mucosa, with possible haemorrhage into the lumen.

Splenic smears may assist diagnosis.

## 5.4 Packaging and submission of samples

















Risk Assessment template

Cooperative Biosecurity Plan Guidelines

Media request form

LHMS Manual- Available to authorised officers at: <https://intranet.industry.nsw.gov.au/online-systems/biosecurity-toolset/bis>

Form - Biosecurity direction

Form – Biosecurity undertaking

Form Application and authority to use anthrax vaccine (Living spore Sterne strain) in NSW

Form – Biosecurity Permit

Policy - Records Management (IND-I-177)

Policy - Information Security (IND-I-197)

Policy - Classified Information (IND-I-196)

Policy -Government Information (Public Access) (IND-I-178)

Policy - Biosecurity collection, use and disclosure of information

Procedure - Biosecurity collection, use and disclosure of information

Procedure - Biosecurity directions

Procedure - Biosecurity undertakings

Procedure - Reporting notifiable pests and diseases of animals

## 12. Records

All events must be entered into LHMS, see the LHMS manual for details. As the state and national reporting requirements for anthrax are extensive, the anthrax specific section of the LHMS manual must be consulted. This includes

- ICT test results, Case report for positive and negative cases and photos of ICT test results
- Field investigations
- laboratory reports
- vaccine authorisations
- regulatory instruments
- risk assessments
- advice
- discussions with private veterinarians about the case.

Records relating to properties placed under biosecurity restrictions are maintained indefinitely in LHMS. Hand written records must be retained as per the Policy-Record management.

## 13. Revision history

| Version | Date issued | Notes  | By                             |
|---------|-------------|--|--------------------------------|
| 1.0     | 01/07/2017  | New procedure developed from amalgamation and complete revision of old policy and procedure in response to the <i>Biosecurity Act 2015</i> | Animal Biosecurity and Welfare |



