Government of Saskatchewan

Anthrax Information for Veterinary Practitioners

Anthrax is endemic in Saskatchewan; therefore, practitioners may have or will in the future be encountering situations where anthrax is suspected. Please read the following information and contact the provincial Chief Veterinary Officer (CVO) at 306-787-5547 with any further questions.

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Case Definition

Case Definition: Any positive test kit result will be treated as a positive sample. If a test kit is negative, but the Disease Control Lab tests indicate anthrax positive, the case will be determined to be positive. Samples sent to Prairie Diagnostic Services (PDS) in Saskatoon will be determined to be positive when reported by PDS as "*Bacillus anthracis* seen" or "*Bacillus anthracis* isolated".

Suspicion of Anthrax

Private veterinarians act as the primary contact for producers for consultation and/or testing for anthrax. The Saskatchewan Ministry of Agriculture will act upon all positive cases diagnosed for anthrax and provide consultation to veterinary clinics.

Producer's Role

Under the Province of Saskatchewan Anthrax Response Plan, producers have the following role:

- Consult with their veterinarian to diagnose the cause of their sick animals.
- Provide assistance for any needed sampling for follow-up testing.
- Dispose of animals in accordance with the directions of the CVO, as provided by the inspector or designated representative.

Herd Veterinarian's Role

Under the Province of Saskatchewan Anthrax Response Plan, herd veterinarians have the following role:

- Carry out required diagnostic tests to confirm a diagnosis when anthrax is suspected.
- Notify the CVO of a positive case within 24 hours.
- Collect and submit any required tissue samples for ancillary diagnostics.
- Coordinate with the Saskatchewan Ministry of Agriculture lead investigator to manage the situation on farm.
- Assist the animal owner and the CVO with the development and implementation of control measures.

Carcass Side Tests

Anthrax cases can be detected by carcass-side tests or laboratory diagnosis. Carcass side test kits will be provided to practitioners. All kits that are used, along with a blood sample (blood-soaked swab) must be sent to the Saskatchewan Disease Control Laboratory in Regina for confirmation regardless of the test result. Further information on sampling and submission information will be supplied with the test kits.

Sample Collection, Submission and Testing

It is important to collect specimens as soon as possible after death of the animal. Samples taken early usually yield a pure isolate, speeding the testing process.

*****If anthrax is highly suspected – DO NOT OPEN THE CARCASS*****

Sampling - samples are listed in order of preference.

1. **Whole blood** taken by syringe and needle from the jugular or tail vein and placed in a sterile vial. This remains the first choice and the best sample to submit to the lab. The blood-filled syringe can be submitted, providing that it can be sealed and is then placed in a sealed bag to avoid leakage; however, the needle MUST be removed first.
2. **Blood soaked swab** taken carefully through a small incision into the jugular. Cover the opening to capture any leakage. Place swab in a sterile tube, adding a few drops of saline to keep it moistened.
3. **Swabs taken from blood-tinged fluids** exuding from anus, vulva, nostrils or mouth. Place swab in a sterile tube, adding a few drops of saline to keep it moistened.
4. **Exudate-contaminated soil** - examine the ground near the nostrils/mouth and anus/vulva for exudate stained soil. Place a small portion of the stained soil in a sterile tube or plastic leak-proof container.
5. As a last resort, submit a **swab soaked with fluid from the spleen** if the animal has been eaten by predators or if a necropsy was performed. Alternatively, swabs may be taken from turbinate bones of livestock and wildlife that have been dead for an extended period of time. Place swab in a sterile tube, adding a few drops of saline to keep it moistened.
6. The submission of solid tissues from organs is discouraged, unless no other sample is available.

DO NOT SUBMIT ears, tongue or hide. **AVOID CONTAMINATING THE OUTSIDE OF CONTAINERS CONTAINING THE SPECIMEN**.

Packaging

1. Provide a complete history for each animal. Fill out one separate test requisition form for each animal submitted. Please include the following information on the form when submitting samples:
    a. Name of submitting veterinary clinic/veterinarian;
    b. Owner's name, phone number and address;
    c. ***Land location and RM number where the suspect animal(s) is (are) located***
    d. Species and number of animals on the premises;
    e. Number of dead animals;
    f. Date of first death; and
    g. Vaccination status for anthrax.
2. Label each specimen as to origin (jugular blood, environmental swab, etc.). Please use rigid plastic containers with leak-proof lids for all samples.

3. Refrigerate sample if there are delays in shipping to the lab; otherwise, ship all samples on ice packs.
4. Dispose of used equipment and supplies separately - do not include them in the sample submitted.
5. ***Pack to avoid leakage of the primary container!***
    - Place **CLEAN** submission forms between the inner and outer packing containers, so sample receiving staff can access them

Shipping

Submit samples to Prairie Diagnostic Services in Saskatoon. It is recommended to wait for confirmed laboratory results before discussing results with clients, as false positives by preliminary smear examination can occur.

Advance notice of these shipments to the diagnostic laboratory will assist the laboratory in planning for receiving and testing the sample. Please fax a copy of your pathology submission form to the provincial Chief Veterinary Officer at 306-787-1315.

Testing

- Testing involves examination by direct microscopy after the polychrome methylene blue- or Giemsa-stained smears to visualize the anthrax capsule. The sample is also cultured on blood agar to evaluate growth characteristics and colony morphology.
- Positive results, reported by PDS as "*Bacillus anthracis seen"* or *"Bacillus anthracis isolated"* are reported to the Canadian Food Inspection Agency and the Saskatchewan Ministry of Agriculture.

Carcass Control

In cases where anthrax is highly suspicious, practitioners will play a role in educating the client in proper carcass management until laboratory diagnosis is confirmed. In the event the carcass is positive, the Ministry of Agriculture will confirm the carcass(es) have been disposed of in an appropriate manner. However, carcass management should begin prior to the lab results being received.

It is expected that when veterinary practitioners are called to examine the carcass of an animal that has died suddenly on pasture, they may have opened the carcass to make a tentative diagnosis. In highly suspicious cases for anthrax, after samples are collected, the producer should be advised how to properly dispose of the carcass to prevent further environmental contamination with spores. Please refer to the document "Information for Producers" for information on disposal.

When anthrax is possible but lower on your differential list and a full post-mortem exam is required, conduct the examination in a manner that minimizes environmental contamination, and be prepared to control or dispose of the carcass. Place a large piece of heavy duty plastic or 6 mil polyethylene sheeting in front of the carcass, and lay out any removed organs, etc. on it. When finished

with the exam, roll up the plastic and parts and place inside carcass. Cover carcass with 6 mil polyethylene sheeting and stake down. Heating and putrefaction under the plastic cover will destroy the vegetative form of bacteria within 48 to 72 hours in warm weather conditions. Or burn or bury carcass immediately.

Carcass Disposal

It is the responsibility of the owner of the premises where the carcass is located to insure that all provincial and municipal regulations that apply to the burial or burning of carcasses are complied with.

As per the provincial anthrax response plan, a private veterinarian may act as an official inspector's "designated representative"

Role of inspectors or designated representative

- Deliver the Quarantine Order.
- Provide educational materials to the owner.
- Arrange laboratory testing at the discretion of the CVO.
- Conduct trace back / trace forward investigations, as required.
- Give direction on management procedures required under the Quarantine Order (QO).
- Give direction on the disposal of carcasses in a manner that does not present a risk to animal health, public health or the environment.
- Follow up to confirm disposal was completed satisfactorily

Protective Personal Equipment and Biosecurity

When attending a premise for the purpose of an investigation or implementation of anthrax control measures, the inspectors or designated representatives must:

- Wear a primary layer of protective clothing that includes coveralls;
- Wear field-dedicated washable footwear;
- Wear a secondary layer of **disposable** protective clothing (coveralls, plastic boots, and gloves) to be worn over the primary layer of protective clothing when handling potentially contaminated animals or material, e.g. examination of an anthrax suspect animal;
- Incinerate all disposable materials; and
- Decontaminate regular coveralls, field boots and other equipment by physical or chemical sterilization/decontamination.

Note: Face masks are not essential PPE when handling potentially contaminated animals or material since anthrax spores are not easily aerosolized in the natural environment.

For general information on preparing to attend premises, attending premises, routine farm inspection and biosecurity protocol while attending premises refer to the following pages for **Biosecurity Recommendations for Visiting a Farm.**

Biosecurity Recommendations for Visiting a Farm

What is biosecurity?

Biosecurity is management practices used to reduce the potential for infectious diseases to be carried onto a farm by new animals, wildlife and other animals, equipment, people, insects, pests, feed and water. Biosecurity practices can also help limit the spread of disease within a farm.

Why should you be concerned about biosecurity?

When farm visits are required, personnel must take steps to prevent the unintentional spread of disease-causing bacteria, viruses and parasites to the farms they are visiting. This is especially important in situations where several different farms are visited in a short period of time.

Many employees have livestock at home; therefore, it is also important when duties require visiting client's farms, employees take similar steps to prevent the spread of disease to their own herd/flock, or vice versa.

How should I prepare for an on-farm visit?

You should always call the producer before coming to the farm; this is a good practice because you can ask the farmer about:

- Current biosecurity practices.
- Where to park.
- Any animal disease issues occurring.
- Supplies they provide.
- Person (people) to ask for when you arrive.

Vehicle Preparation:

- Divide the vehicle into clean (i.e. front seat area) and dirty (i.e. trunk or box) areas. Ensure you never enter the clean area of the car with soiled footwear/clothing. Store and transport clean items (boots, coveralls and equipment) in the clean area, and keep dirty items in the dirty area.
- Large plastic containers (Rubbermaid bins) are easily cleaned and disinfected, and work very well for keeping clean and dirty items separated. Garbage bags can also be used, but should be thrown out after one use.
- Removable rubber mats are helpful since they can be easily cleaned and disinfected.

- It may be useful to line the vehicle with rubber or heavy plastic liner to facilitate easy cleaning and decontamination, if required.
- Regularly wash vehicles, especially if multiple site visits are occurring in a short period of time. Pay close attention to tires, wheel wells and the under-carriage.

Equipment and Clothing:

- A clean, washable or disposable pair of coveralls is required for each farm visited.
- Boots must be easily disinfected and made of a material that does not trap dirt and/or manure. Boots with deep tread soles should be avoided since it is difficult to completely remove organic matter.
- A brush and pail to clean and disinfect boots.
- Disinfectant - make sure to prepare your disinfectant (according to dilution instructions on the label) before leaving. Follow all label instructions for whatever product you choose.
- Disposable gloves and heavy duty plastic containers/garbage bags to store used coveralls and contaminated materials.
- 4 L of water, if not available on site.
- Hand sanitizer.
- Paper towels.

What if the farm already has biosecurity protocols in place?

Many livestock facilities have very stringent biosecurity protocols in place for their operation. These may exceed the recommendations stated here and employees must strictly follow the individual farm biosecurity protocols when they are provided.

What are some recommended procedures I should follow when entering the farm?

- If possible, park the vehicle away from heavy traffic areas in a clean, dry area with no obvious manure accumulation.
- Notify the producer of your arrival at the main office or house.
- Put on clean coveralls and previously cleaned and disinfected boots near the vehicle.
- In the winter months, warm layered clothing should be worn underneath coveralls. If winter jackets are required they should have a moisture resistant fabric. If visiting more than one premise that day, the jacket should be cleaned with a disinfectant before entering the farm. Ideally, use a washable or disposable coverall over the winter jacket.
- Wash hands before entering the facility. Alcohol based hand sanitizers can be used if hand washing facilities are not available.
- Keep prepared disinfectant, pails, and brushes beside vehicle, out of reach of livestock, children or other animals. In the winter, if possible, ensure mixed disinfectant does not have the opportunity to freeze.
- Only bring required equipment/forms onto the farm. Equipment should be cleaned and disinfected prior to use.

What are some of the procedures I should follow when leaving the farm?

- Any equipment that has become contaminated should either be cleaned and disinfected or left on the farm (if possible). If you are unable to clean and disinfect the equipment sufficiently, place the equipment in the dirty area of the vehicle, preferably in a plastic bin or garbage bag.
- Recording equipment (clipboards, laptops) should also be cleaned and disinfected, therefore only bring things on the farm than can easily be cleaned and disinfected.
- Clean boots with boot brush to remove visible organic matter. Place boots in container with disinfectant solution in the dirty area of the vehicle. Leave boots in disinfectant solution for the recommended contact time which will be on the product label.
- Also make sure to clean and disinfect the boot brush and boot pail or, if it is your last or only farm visit of the day, place the brush and pail in a plastic bin or bag to be cleaned later.
- Remove coveralls and try to avoid contaminating street clothes, place washable coveralls in heavy duty garbage bags and place in dirty area of the vehicle. Used/dirty coveralls should not be worn in the vehicle.
- Wash hands with soap and water. If water is not available, use alcohol based hand sanitizers. Always wash hands before eating or drinking.
- When driving off the farm, avoid any areas where manure has accumulated.

What should I do when I return to the office?

- Remove the clothes, boots, and equipment from the vehicle. By placing dirty clothing/equipment in bags or bins this helps keep this area clean.
- Any equipment or supplies taken on farm should be cleaned and disinfected before being taken onto another farm.
- Throw out disposable coveralls or wash cloth coveralls in hot soapy water and place in dryer afterwards.
- It is good practice to shower after visiting other farms to remove any possible infectious agents from your hair or skin.
- Wash your vehicle if exposed to manure, such as when driving in a pasture.

What are the procedures if I am not physically touching any animals?

- You do not have to physically contact any of the animals to pick up and spread pathogens. You can transfer infectious agents by touching livestock directly or by contacting any animal secretions or excretion including, milk, blood, saliva, semen, manure, urine, mucus, or other discharges.

Cleaning and Decontamination of Contaminated Sites and Materials

Information in Appendix 8 obtained from: World Organisation for Animal Health. 2008. Anthrax in humans and animals, 4th Ed. Retrieved from http://www.who.int/csr/resources/publications/anthrax_webs.pdf

Soil:

- If possible, soil at an anthrax site should be removed up to a depth of 20cm and incinerated.
- If this is not possible, soil should be disinfected with 10% formalin (contains 3.7% formaldehyde) at 50 litres per m^2.

10 % formalin (1:10 dilution)	1 part formalin to 9 parts water

** Formalin is sold as 37% solution of formaldehyde in water. Always follow manufacturer's label directions to get proper dilution rates.*

- When soil is saturated with water or it is a heavy type soil, complete penetration of formalin may not be possible, it is recommended in these situations to check effectiveness with additional swabs and cultures.
- Where it is not feasible to remove and incinerate or chemically decontaminate soil, the alternate is to close or seal off the site, i.e. covering with concrete or tarmac or planting with thorny bushes and secured fencing.

Equipment and Structures:

Stage 1: Preliminary Disinfection

One of the following disinfectants may be used in amounts of 1–1.5 litres per square metre for an exposure time of 2 hours:

- 10% formalin (temperature should be ≥ 15 °C);
- Hypochlorite (bleach) solution containing 10 000 ppm active chlorine (note: chlorine is rapidly neutralized by organic matter; if this is present, it should be washed down first with water and collected into suitable containers for autoclaving or formalin disinfection);

Available chlorine 1% or 10,000 ppm (1:5 dilution)	1 part bleach to 4 parts water.
Available chlorine 0.5% or 5000 ppm (1:10 dilution)	1 part bleach to 9 parts water

** Calculations based on a 5% hypochlorite (bleach) solution*

- 3% hydrogen peroxide solution.

3 % Hydrogen Peroxide (1:12 dilution)	1 part hydrogen peroxide to 11 parts water

** Calculations based on a 35% hydrogen peroxide solution*

Stage 2: Cleaning

Where practical, cleaning of all surfaces should be done by straightforward washing and scrubbing using ample hot water or mild hypochlorite solution (5000 ppm active chlorine). The operator should wear protective clothing, face and hands included. Cleaning should be continued until the original colours and surfaces are restored and the

wastewater is free of dirt particles. At the end of the process, residual water should be removed and disinfected and the surfaces dried.

Stage 3: Final Decontamination

For final disinfection, one of the following disinfectants should be applied at a rate of 0.4 litres per square metre for an exposure time of at least 2 hours:

- Hypochlorite (bleach) solution (10 000 ppm available chlorine)
- 10% formalin (temperature should be ≥ 15 °C)
- 3% hydrogen peroxide solution.

After the final disinfection, closed spaces such as rooms or animal houses should be well ventilated before recommissioning. The effectiveness of the disinfection procedure cannot be assumed, and attempts should be made to confirm that it has been adequate by means of swabs and culture.

Clothing and Boots:

Wherever possible, contaminated materials should be incinerated or autoclaved at 121 °C for 60 minutes. Use of disposable items facilitates this. In the case of contaminated non-disposable items such as clothing, boots, tools, etc., excess dirt should be scraped off and incinerated and the items themselves should be soaked overnight (at least 8 hours) in 10% formalin. (Caution: avoid skin contact with formalin solutions or inhalation of their vapors). Bleach is a possible alternative if discoloration or corrosion is not of consequence, and there is little organic material left on the items after scraping. .

Manure, bedding and feed:

Wherever possible, contaminated materials such as bedding, feedstuffs, and manure should be incinerated.

Anthrax contaminated feed can safely be fed once two weeks have passed since animals have been vaccinated; however, care should be taken to make sure no dust is produced i.e. do not use a bale shredder.