

Anthrax Regulatory Actions

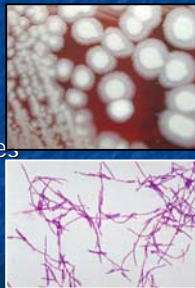
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Anthrax: The Disease

- A bacterial infection caused by *Bacillus anthracis* which causes high morbidity and mortality in cattle, sheep, horses and other mammals
- Animals are usually found dead but may show clinical signs of depression, elevated temperature, congestion of mucus membranes and inappetance.

The Organism

- *Bacillus anthracis*
- Large, gram positive non-motile rod
- Vegetative form and spores
- Nearly worldwide distribution
- Over 1,200 strains



Clinical Signs

- Most often per-acute and animals are found dead
- Just before or after death there may be bloody discharge from the mouth, nostrils or anus. This blood is dark, tar-like and does not clot
- Bloody urine and feces and swelling in the neck and shoulder area may be observed
- In horses, colic may be the only sign observed

Clinical Signs

- Signs differ by species
 - Ruminants at greatest risk
- Three forms of illness
 - Peracute
 - Ruminants (cattle, sheep, goats, antelope)
 - Acute
 - Ruminants and equine
 - Subacute-chronic
 - Swine, dogs, cats



Animal Transmission

- Most commonly infected by ingestion from contaminated soil



Ruminants

- Peracute infection
 - Rapid onset
 - Sudden death
 - Bloody discharge from body orifices
 - Incomplete rigor mortis
 - Rapidly bloat



Ruminants

- Acute infection: 1-3 days
 - Fever, anorexia
 - Decreased rumination
 - Muscle tremors
 - Dyspnea
 - Abortions
 - Disorientation
 - Bleeding from orifices
 - Hemorrhages on internal organs

Differential Diagnosis

- Blackleg
- Botulism
- Poisoning
 - Plants, heavy metal, snake bite
- Lightening strike
- Peracute babesiosis

Equine

- Ingestion
 - Enteritis, severe colic, high fever, weakness, death within 48-96 hours
- Insect bite/vector
 - Hot, painful swelling
 - Spreads to throat, sternum, abdomen, external genitalia
 - Death



Swine

- Sudden death without symptoms
- Localized swelling of throat
- Death by asphyxiation
- Ingestion of spores
 - Anorexia, vomiting,



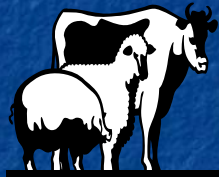
Dogs & Cats

- Relatively resistant
 - Ingestion of contaminated raw meat
- Clinical signs
 - Fever, anorexia, weakness
 - Necrosis and edema of upper GI tract
 - Lymphadenopathy and edema of head and neck
 - Death
 - Due to asphyxiation, toxemia, septicemia



Anthrax: A Reportable Disease

- Anthrax is reportable under the *Health of Animals Act*.
- All suspected cases must be reported to a veterinarian of the CFIA
- Any unexplained deaths of susceptible animals should be investigated promptly



How Anthrax differs from other reportable diseases

- Environmental disease
 - Not contagious
- No international trade barriers
- No animals are ordered destroyed by CFIA
 - An indemnity is paid
- There is an effective vaccine that can prevent the disease.

CFIA Involvement

- Prevent further environmental contamination
- Prevent potential human involvement through reporting of cases and proper disposal of carcasses.

History of Anthrax in Canada

- 2005
 - 12 premises, south west Manitoba
 - 26 cattle, 10 horses
- 2004 (winter)
 - 1 premises, west central Saskatchewan
 - 14 cattle
- 2003
 - 3 premises south east Manitoba
- 2002 – no cases reported

History of Anthrax in Canada

- | | |
|--|--|
| ■ 2001 <ul style="list-style-type: none">■ BC 2; AB 2; SK 2; MB 4; NWT 5 | ■ 1998 <ul style="list-style-type: none">■ MB 2 |
| ■ 2000 <ul style="list-style-type: none">■ AB 9; SK 1; MB 24; NWT 1 | ■ 1997 <ul style="list-style-type: none">■ No cases reported |
| ■ 1999 <ul style="list-style-type: none">■ AB 13 | ■ 1996 <ul style="list-style-type: none">■ AB 4 |
| | ■ 1995 <ul style="list-style-type: none">■ No cases reported |

Diagnosis

- Do not open the carcass!
 - Necropsy not advised!
- Samples of peripheral blood
 - Cover collection site with disinfectant soaked bandage to prevent leakage



Infection with Anthrax

- Anthrax spores remain viable in soil for many years (50-250 years).
- Spores have a tough outer coat making them very resistant to environmental conditions.
- The anthrax spores can survive for many years
 - slightly alkaline soils and in soils rich in organic matter, especially land that is low-lying marshy or subject to periodic flooding may favour survival time
 - On warm days the water evaporates and spores are exposed to grazing animals.

Quarantine

- The incubation period of anthrax
 - varies but ranges from 1-14 days;
 - in rare circumstances it may be up to 20 days
- Anthrax vaccination
 - starts to become effective within 7 -8 days of initial vaccination
 - Mortalities on positive premises stop
 - Full protection within 2 – 3 weeks
 - Use of antibiotics will interfere with the action of the vaccine

Quarantine

- Therefore, quarantines are in place until **21 days after all animals have been vaccinated OR 21 days after the last case of anthrax on the premises**, whichever is later.

Environmental Risk Factors

- Environmental risk factors for infection by anthrax spores include very wet weather and continuous warm/hot weather
 - Heavy rains followed by hot dry weather is the most common scenario
 - Drought conditions which result bare pastures, and dried up water sources

How do spores form?

- Sporulation of *B. anthracis* in an opened carcass is affected by temperature
- At temps less than 20 degrees C, spores do not form
- This is the reason that it is extremely important to not open the carcass as when the bacteria are exposed to oxygen they sporulate

Exposure to Anthrax



- Exposure to anthrax spores may also occur following excavation or ploughing of previously unbroken land

Carcass Disposal

- Prompt disposal of dead animals by either cremation or deep burial to prevent further environmental contamination with anthrax spores.
- Under certain environmental conditions such as unsuitable burial sites, prolonged rain or logistical issues, disposal may be delayed

Carcass Disposal

- Disposal of carcasses and infected material must be done under the supervision/direction of CFIA
- The preferred method of disposal is burning
 - The goal of burning is to destroy as many spores as possible to decrease the likelihood of disease in future years

Carcass Disposal

- Deep burial alone does not destroy spores
however
- The natural decomposition of a carcass will destroy most of the vegetative organisms through the action of putrefactive bacteria
- This will occur within 48 to 72 hours in warm weather conditions

Carcass Disposal

- To minimize the potential for environmental contamination
 - leave carcasses intact at their original location
 - Prevent scavenging and insect infestation
 - Covered with tarps etc.
 - The carcass and area should be covered with a disinfectant such as 10% formaldehyde, quick lime or a 5% solution of lye

Carcass Disposal

- Once the carcass has putrefied it will pose a lesser risk of environmental contamination during subsequent handling for disposal.
- Proper carcass disposal can then be undertaken when weather conditions improve or logistics make it possible

Vaccination

- Vaccination prevents anthrax in most animals
- All livestock on a positive premises are vaccinated by the CFIA
- Protection starts 7-21 days after vaccination depending on the species
- A single dose is protective for 6 months to a year.

Sterne Vaccine

- A single dose of vaccine is protective,
 - the manufacturer recommends a booster dose two to three weeks after the initial vaccination when the premises is considered highly contaminated.
- On positive premises CFIA will provide an **initial single dose** at no charge to the owner
- It is recommended that owners annually re-vaccinate their herds for at least three years following an outbreak.

Vaccination

- CFIA does not vaccinate surrounding herds
 - This is a decision between the producer and their private vet and the cost is incurred by the producer
- All herds within 10km of a positive premises should be vaccinated
 - Distance varies with each situation
- off label use should be considered for bison and farmed elk/deer

Antibiotics or Vaccination?

- CFIA will advise on the alternatives available to producers and their private veterinarian
- Each decision will depend on the specific circumstances and should be made in consultation with the producer and private veterinarian



Antibiotic Treatment

- The choice to treat with antibiotics, the cost of antibiotics and administration of the drugs are done by the producer and their veterinarian
 - Producers may elect to treat with antibiotics pending a lab result
 - LA penicillin is generally the antibiotic of choice

Antibiotic Treatment

- When mortalities are very high the decision may be made to first treat the herd with LA200 to stop all incubating infections and then vaccinate 7-10 days later
 - Effective when animals can be removed from the contaminated pasture.

Why not treat with both?

- The anthrax vaccine is a live anthrax vaccine and concurrent treatment with antibiotics will inactivate the vaccine
- Most antibiotics persist in an animals blood for a few hours up to five days
- Antibiotics should not be administered within 8 days of vaccination

Indemnity paid for Anthrax

- To assist owners of animals that die of anthrax with disposal costs,
- to encourage reporting of suspect cases.



Indemnity paid for Anthrax

- The indemnity is paid for deaths confirmed by the CFIA either via laboratory testing or a clinical diagnosis by a CFIA veterinarian



Can I slaughter animals?



- Vaccinated animals should not be slaughtered for 42 days after the last dose of vaccine
- There is no withdrawal time for milk

Indemnity for Anthrax Cases

- Indemnity rates for domestic animals which have died of anthrax have the following maximums:
 - Cattle \$500.00
 - Horses \$350.00
 - Sheep, Goats and Swine \$100.00
- The carcass must be properly disposed of and cleaning and decontamination must be completed
- Limits for indemnity are prescribed by law

Cleaning and Decontamination (C & D)

- No C & D is required if the animal died at pasture and the carcass was properly disposed of on the site without being moved



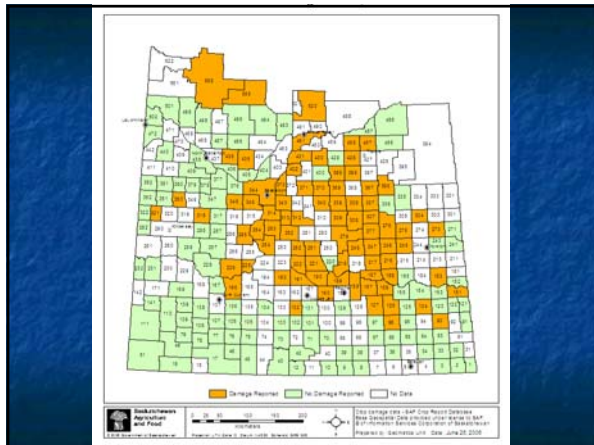
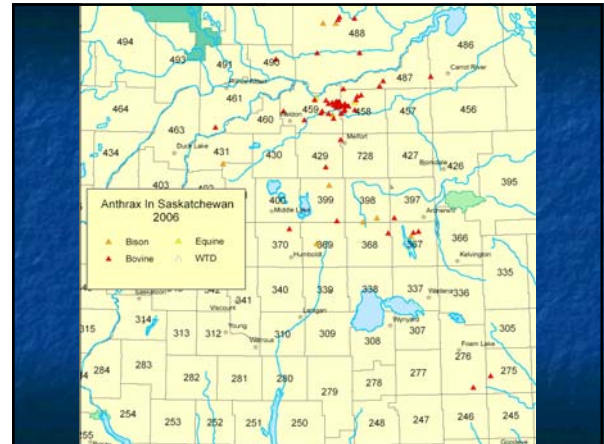
C & D

- Any equipment used in the event a carcass was moved needs to be treated with 10% formaldehyde or heat. (shovels, trucks, etc.)



Current Situation in Saskatchewan

- 73 farms have been quarantined
- 71 have been confirmed positive
- 324 deaths have been reported
- RMs: Willow Creek, Kinistino, Spalding, St. Peter, Ponass Lake, Humboldt, Pleasantdale, Nipawin, Torch River, Flett's Springs, Chaplin, St. Brieux, Prince Albert, Moose Range, Barrier Valley, Insinger, Hazel Dell, Foam Lake, Garden River, Invergordon



Next Steps

- Work closely with Sask Agriculture and Food, Private Veterinarians, Sask Environment, Sask Health and local producers
- Continue with carcass disposal on affected farms
- Maintain quarantines and monitor for new outbreaks
- Provide regular updates on the extent and distribution of the outbreak

Questions???