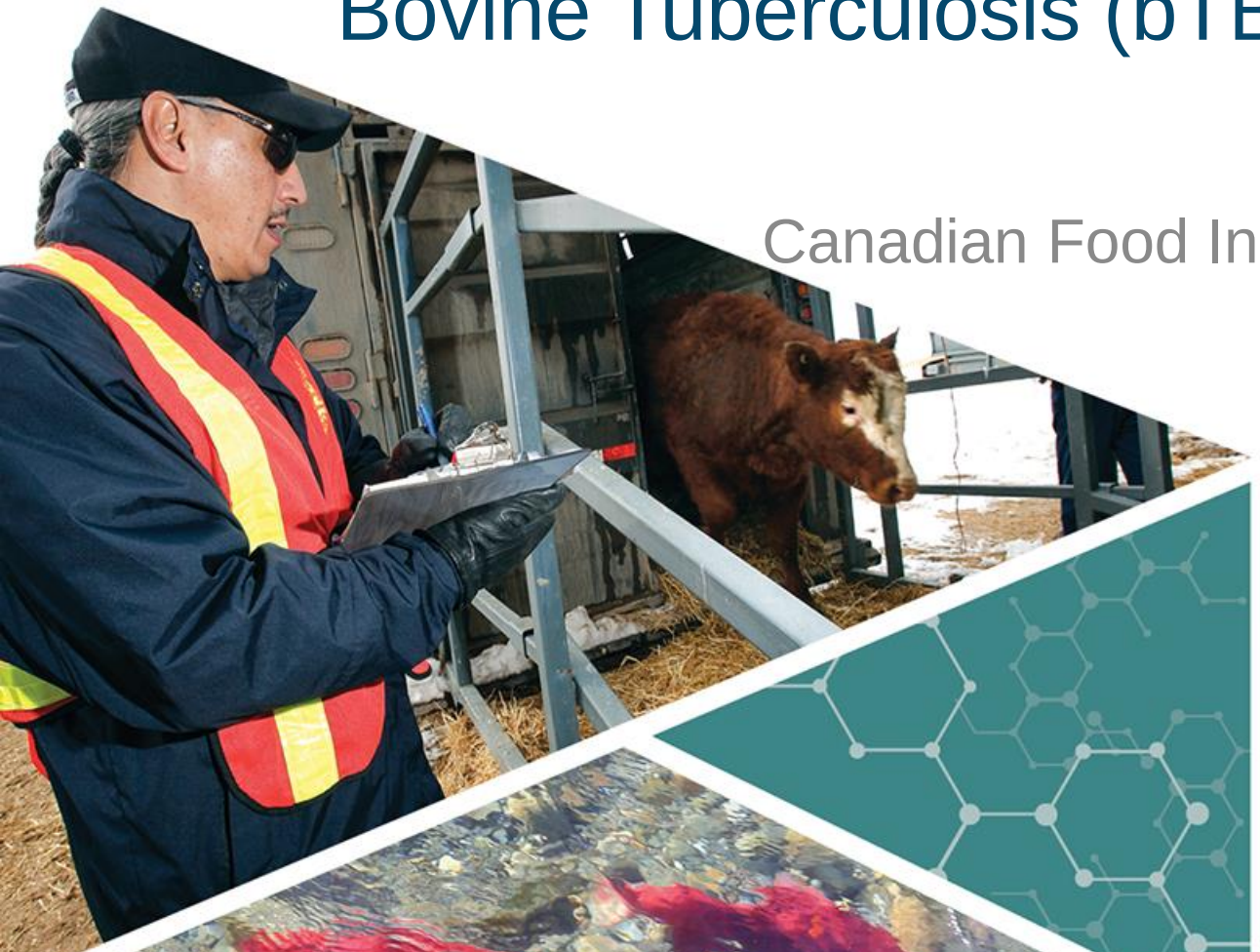
Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

Bovine Tuberculosis (bTB) in Canada

Dr. Debbie Barr
Canadian Food Inspection Agency

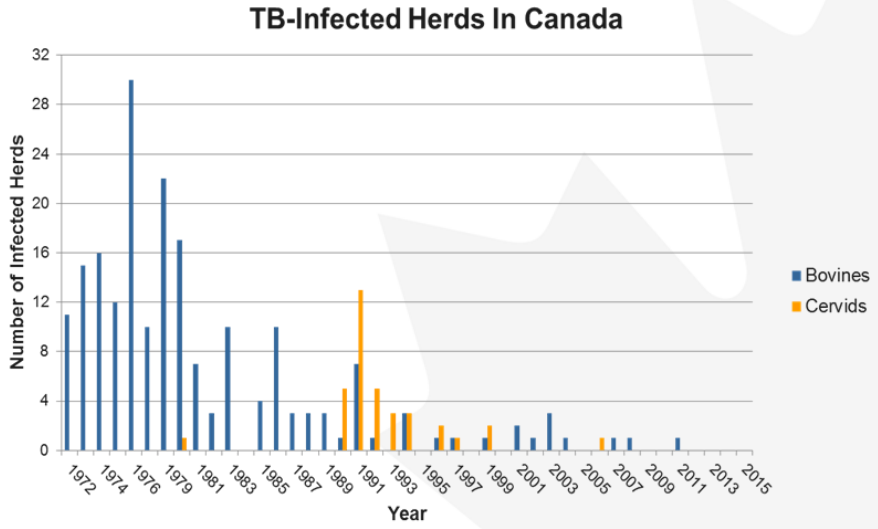


Canada

bTB Regulatory Status

National bTB eradication program

- Bovine TB is a federally reportable disease under the *Health of Animals Act* and has been the subject of a mandatory national eradication program in Canada since 1923
- The CFIA's TB eradication program continues to evolve to incorporate scientific and diagnostic advancements and to reflect the current disease status across the country
- Program pillars include surveillance, disease investigation, disease outbreak response and wildlife reservoir management
- Prior to 2016, the last outbreak in Canada occurred in 2011



2016 bTB Investigation

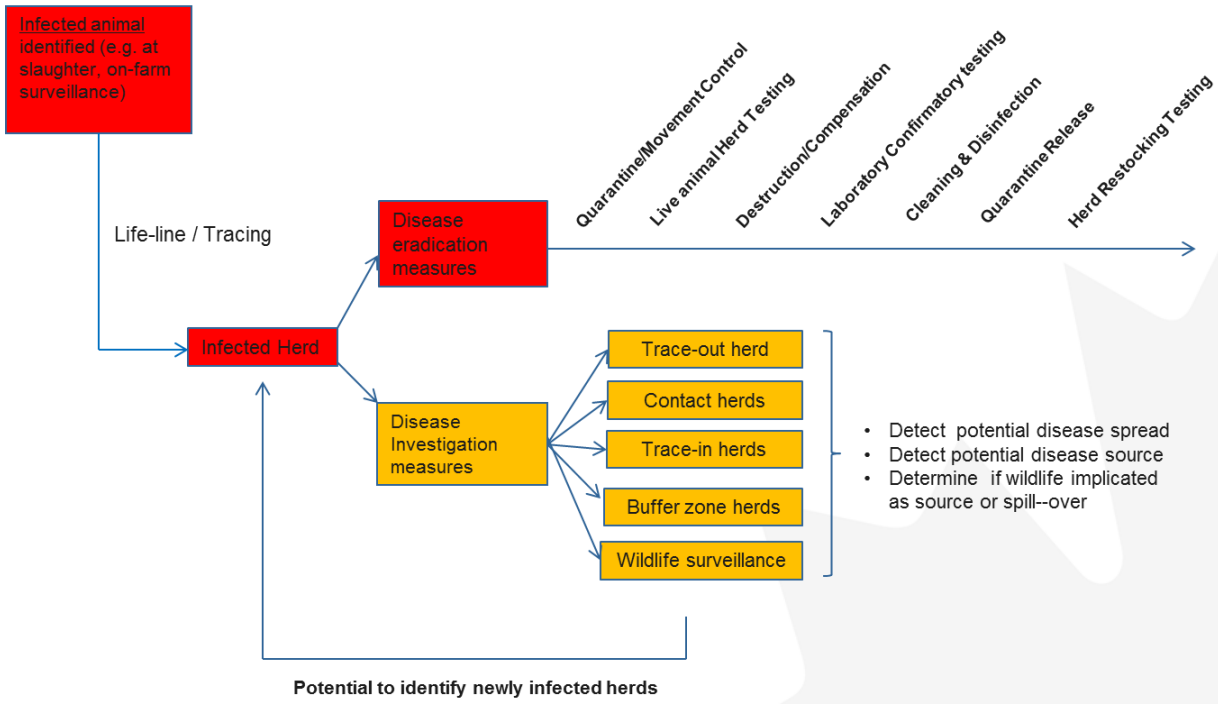
- September 2016 - USDA reported to the CFIA a positive bovine tuberculosis case in a mature cow slaughtered in the USA - The cow originated in Alberta
- A complex investigation due to community pastures, significant animal movement and limited traceability info
- Six confirmed cases of bTB on the index premises
- Confirmed as the same strain, which has not previously been detected in Canada
- The strain is closely related to a strain first detected in cattle in Central Mexico in 1997

Canada's bTB Response Program

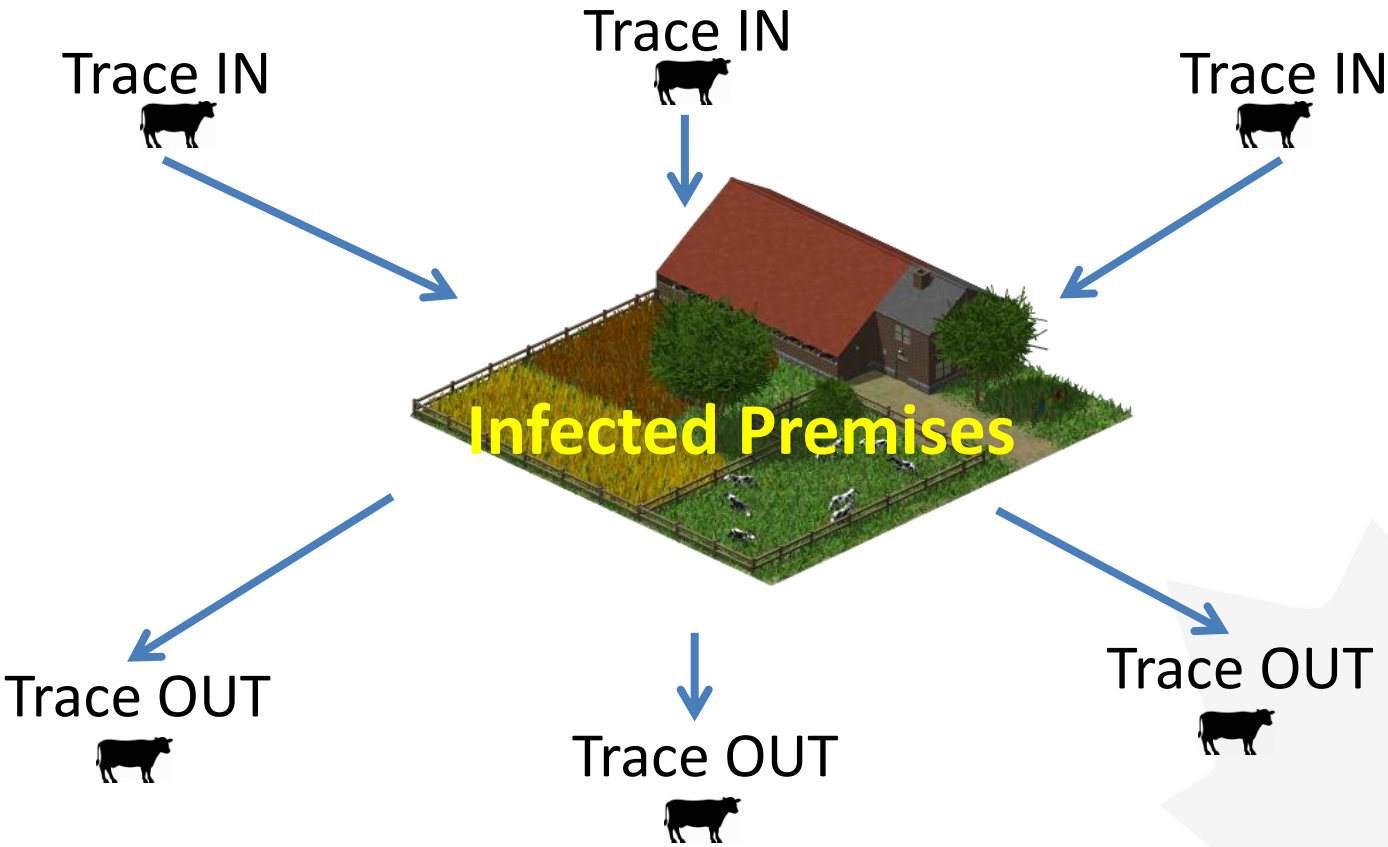
Main program elements:

- Surveillance
- Suspect disease investigation
- **Confirmed disease investigation**
- Reservoir management
- Certification of TB-status

Confirmed Disease Investigation

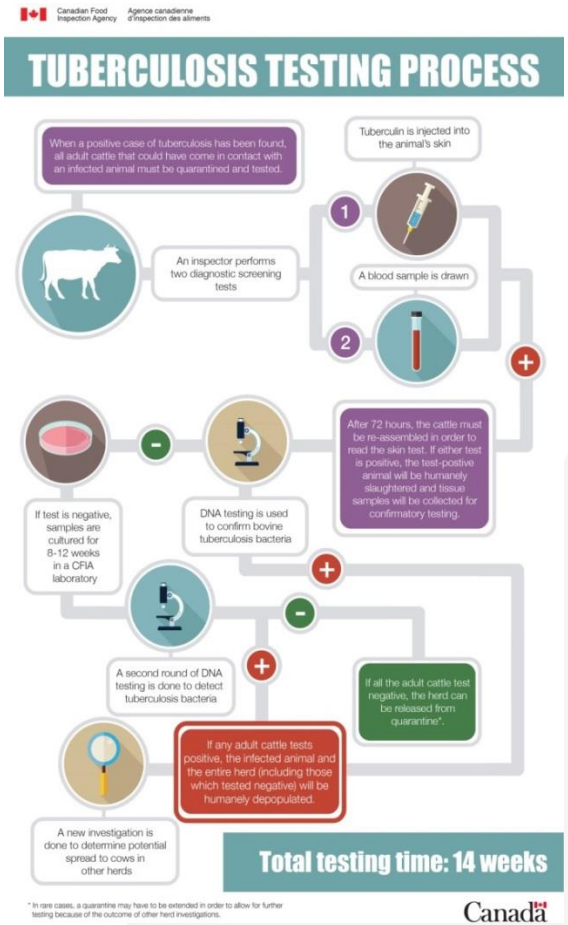


Tracing based on an Index Premises' 5 Year History



Disease Response Testing

- Determining the disease status of a herd involves multiple tests and different time lines depending on the risk
- When required, full testing process is at least **14 weeks** from the date of processing



InfoGraphic on bTB Testing Process Available on the CFIA Website

Index Farm & Trace Out Testing

1. On farm Caudal Fold Tuberculin (CFT) Test – Screening test with tuberculin injected intradermally at the caudal tail fold (assessed for reaction 72 hours later)
2. On farm blood sample – Screening test submitted for serology (ELISA)

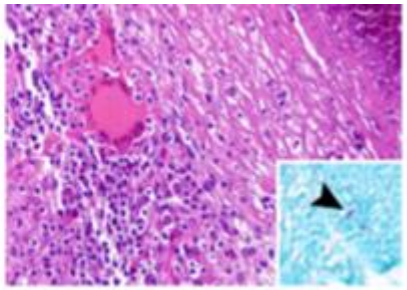
All reactors humanely destroyed, subject to further testing

3. Enhanced post mortem + samples collected for testing
4. Histopathology
5. PCR for TB complex organisms in tissue samples with histopathological findings suggestive of TB
6. TB Culture and PCR for bacterial identification

Index Farm & Trace Out Testing

- All animals on the index properties and those that comingled with the index herd on community pasture are ordered humanely destroyed
- Testing results and epidemiological assessment informed the timing of full quarantine release for all trace out and contact premises

Lesion on lymph node



Lesion found during histopathology exam

Trace In Testing

1. On farm CFT Test – Assessed for reaction 72 hours later

Reactors subject to Ancillary testing (subject to change):

2. On farm Comparative Cervical Tuberculin (CCT) Test – avian and bovine tuberculin injected intradermally at two sites on the neck (assessed for reaction 72 hours later)

   OR

3. Blood sample submitted for gamma-interferon testing (blood-based in vitro laboratory test, based on detection of cell-mediated immune response to infection)

All reactors to ancillary test ordered humanely destroyed and subject to the full suite of post mortem testing (as noted previously)

Trace In Testing

- Trace in animals are considered lower risk because there is no **known** exposure
- Therefore ancillary testing applied in order to provide greater on-farm testing specificity thus ordering fewer animals destroyed
- Trace in quarantines are release following the same parameters as outlined for trace out and contact herds

bTB Field Logistics Challenges

- The bTB disease response experienced logistical challenges including:
  - Community pasture – very large number of implicated animals
  - Animal identification and traceability – limitations in implementation of requirements resulted in response challenges
  - Assembling testing teams with training for CFT
  - Freezing of tuberculin in the syringes before and even during actual injection over winter months
  - Serum collected from Index and Trace out herds transported from Alberta and Saskatchewan to Ottawa requiring results available within 72 hours to avoid muster of cattle multiple times

bTB Laboratory Challenges

- The bTB disease response experienced laboratory challenges including:
  - High false positive results with commercial ELISA
    - Required final validation and in house ELISA
  - Logistics of running Gamma-interferon test not compatible with large scale use
  - Issues with enhanced postmortems
    - Time and space
    - Sampling and fixing
  - Space for culture
  - Multiple different testing regimes had to be developed to cater to different risk scenarios, resource requirements and impact on industry (no one size fits all protocol)

bTB Response Successes

- The bTB response has also noted success:
  - No trade issues have arisen to date
  - Cattle commodity prices do not appear to have been impacted
  - Impacted producers have been supported through CFIA compensation for animals ordered destroyed, as well as Federal and Provincial Assistance programs
  - The diagnostic tools have enabled the CFIA to complete the diagnostic testing, maintain a high level of confidence in the disease status of herds and individual animals, and to remove movement controls and quarantines as quickly as feasible

Summary & Lessons Learned

- Approx. 11,500 animals have been ordered destroyed 5,700 under quarantine and 13,000 animals have been released from quarantine
- Additional quarantines will be put in place as trace in activities continue
- Limitations in animal identification and traceability design and implementation has directly impacted the success and speed of the investigation
- Industry's use of comingling sites (e.g., community pastures) has resulted in a large numbers of animals implicated in the investigation
- Disruption of normal industry management practices quickly resulted in animal welfare and economic issues – Significant impact on producers
- Good communication with affected producers is essential - More is better

Questions?

Further Information Available on the CFIA Website:

http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/reportable/tuberculosis/eng/1330205978967/1330206128556