Wisconsin Bovine Tuberculosis Updates

Elisabeth Patton
USAHA TB subcommittee
October 2019
TB, one year and counting updates

• Where did we start?
• What have we done?
• What’s next?
Wisconsin TB Response Plan
2015 TB case response

Jan 2015
Patient begins work on farm

Apr 2015
Initial TB evaluation, Patient placed in isolation

4/17/15
MTBC culture: positive. LHD notifies WTBP

4/29/15
DHS notifies DATCP of farm worker diagnosed with *M. bovis*

5/18/15
31 cattle screen positive; herd quarantined, confirmatory tests performed

5/26/15
Cattle tissues negative for TB; herd quarantine ended

9/14/15
Screening tests repeated for cattle herd

9/21/15
All cattle negative on confirmatory test; herd quarantine ended

Mar 2015
Patient’s signs and symptoms begin

Apr 2015
WSLH runs AFB-smear and NAAT: both positive

4/28/15
CDC identifies isolate as *M. bovis*

5/15/15
Screening tests performed on ~1500 cattle at worker’s farm

5/21/15
1 suspect on confirmatory test; animal euthanized, tissues sent for testing

Jul 2015
Patient released from isolation (no longer contagious)

9/17/15
28 cattle screen positive; herd quarantined, confirmatory tests performed
TB Testing in Cattle

- Caudal fold tuberculin test (CFT)
  - Screening test for bovine TB
  - Purified protein derivative of bovine tuberculin- intradermal injection in the caudal tail fold

- Comparative cervical tuberculin test (CCT)
  - Confirmatory test for bovine TB
  - Purified protein derivatives of bovine and avian tuberculin- intradermal injection in the neck
Oct 2018 Slaughter Trace Investigation
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M. bovis Phylogenetic Tree
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All isolates in 17B3 share this SNP
Wisconsin Dairy Farm Share by Herd Size*

In 2017, two-thirds of Wisconsin’s dairy farms had 100 cows or less; the proportion of very large herds of 500+ cows remains relatively small at 5.4%.

- 500+ Head: 5.4%
- 200-499 Head: 11.2%
- 100-199 Head: 18.4%
- 20-49 Head: 22.2%
- 50-99 Head: 34.9%
- 1-19 Head: 7.9%

Total WI Dairy Farms - 2017: 8,327

Source: USDA/NASS, 2017 Census of Agriculture

*Operations with Milk Sales

Oct 2019
7500 herds
Wisconsin Monthly Dairy Farms Statistics

Number of Licensed Dairy Herds: 7,476 herds (October 1, 2019)
Number of Dairy Cows: 1,267,000 dairy cows (September 2019)
Average Number of Cows Per Dairy Farm: 169 dairy cows (September 2019)
Total Monthly Milk Production: 2.52 billion pounds (September 2019)
Monthly Milk Production Per Cow: 1,985 pounds or 231 gallons
Daily Milk Production Per Cow: 66 pounds or 7.7 gallons

Source: Wisconsin Agricultural Statistics Service (WASS)
In State Traces

- Over 300 traces
  - Multiple legs to some locations
    - Market
    - Buyers
    - Slaughter
Distributions of Trace Cases in EMRS

275 Out of State traces
Trace Herd Investigations

• Contact herds

• Contact trace in/trace out herds
  – Sales Records from Dealers/Markets

• Process
  – Complete Epidemiology form
    – Breeding animals
    – Feeder Animals
  – Determine next steps
    – Herd quarantine
    – Herd testing
    – Restricted movement to slaughter
    – Herd plan

https://www.etsy.com/listing/609849165/cow-cookie-cutter-by-ecrandal?gpla=1&gao=1&gclid=EAIaIQobChMIuIr5wo_k3gIVEtbACh01VAHdEAQYAlABEgKSuvD_BwE
Surveillance in White-tailed Deer

- Notification of positive dairy farm came approximately 3 weeks before the start of the traditional gun deer season in the state
- Worked quickly to mobilize to get white-tailed deer samples from 9 townships surrounding positive dairy farm
- Low deer density/habitat in comparison to the remainder of the counties
- A total of 232 white-tailed deer were tested for bovine tuberculosis (bTB) from the fall hunting season.
Surveillance in White-tailed Deer

- Used existing system in place for CWD head sampling collection
- Staffed for opening weekend
- 4 locations in the 9 township area
- Collected heads taken to DNR CWD processing center for sample collection
Surveillance in White-tailed Deer

• Samples collected: Medial Retropharyngeal, Parotid, and Submandibular lymph nodes.

• Pooled geographically in groups of 5-6 animals for culture submission

• Half of samples from each animal kept frozen in house for follow-up should culture identify a positive pool

• Worked closely with our partners at DATCP, the Wisconsin Department of Health Services (DHS) and the U.S. Department of Agriculture (USDA) to develop surveillance plan

• Plan to continue for minimum of 3 years.
Wildlife Sampling

• Wildlife Services
  – Trapping mesocarnivores
    – Raccoons, opossums
  – DATCP/USDA VS sampling
  – USGS laboratory
  – Collecting lymph nodes 2019, 2020
    – 10 raccoons
    – 6 opossums
      – NGL
      – All pending cultures
Lessons Learned

• One Health
  – Human WGS prevented a lot of testing
    – Trace backs- source of infection
  – Established communication plan with other agencies
    – Public Health
    – Department of Natural Resources
  – Proactive Human Health Programs needed
    – Producer driven
Lessons Learned

• Trace Investigations
  – Official Identification Needed
    – Farm of origin
    – Recorded at points of concentration

• Unified message to producers/practitioners
  – Joint public meetings with USDA/Public Health/DNR