M. bovis situation in Minnesota

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US Bovine Tuberculosis Control Program

Slaughter surveillance

– Observe carcass for visible lesions (granulomas) with traceback of positive cattle to herd of origin
– Minimum standard of 1 granuloma per 2,000 adult cattle slaughtered per plant.
US Bovine Tuberculosis Control Program

Individual cattle testing

- Not routinely used currently in US, except for testing epidemiologically traced herds
- Accredited vets test cattle using **Caudal Fold Tuberculin test**
  - Suspect = any swelling or reaction
- State or federal vets test suspect cattle using **Comparative Cervical Tuberculin (CCT) test**
- Herds with CCT positive cows
  - All cattle removed to slaughter with indemnity OR
  - Reactor cattle removed and slaughtered and herd quarantined with repeat testing
Bovine TB identified at Wisconsin slaughter plant

February 2005

5 year old cow traced to Minnesota beef herd using back tag applied prior to sale for slaughter

Glaser, 2016, Plos One
Bovine TB in Minnesota, 2005-2009

- Animals detected
  - 12 infected beef cattle herds
    - 37 lesioned cattle
  - 27 free-ranging deer

- Source of *M. bovis*
  - *M. bovis* in cattle and deer linked to isolates from cattle in southwest US and Mexico
Epidemiologic links between cattle herds in Minnesota Bovine TB outbreak, 2005-2009

All but 2 herds connected through known cattle movements

Linda Glaser, MN Board of Animal Health
Control of bovine tuberculosis in Minnesota

- TB testing of epidemiologically linked herds with movement restrictions
- Annual testing of cattle and other ruminants in affected zone
- TB testing for fairs
- Statewide cattle surveillance
- Depopulation of positive cattle herds with indemnity payments
- Buy-out of cattle producers in Management Zone (45/60 farms)
- Hunter-kill deer surveillance
- Ban feeding of deer
- Reduce deer population
Cattle in United States

2014/2015:
90 million cattle: 30 million beef cows, 9 million dairy cows
913,000 cattle farms: 728,000 beef farms, 64,000 dairy farms


Source: Hoard’s Dairyman
1 dot = 1500 cows
About 1,000,000 cattle legally enter the US from Mexican each year.
Risk-based Surveillance

• Disease does not behave randomly
  – Underlying risk factors enhance or limit spread
    • Cattle movement primary risk factor for bovine TB

• How to target surveillance?
  – Focus on strata of the population more likely to have a disease cases as consequence of risk profile
Cattle movements in Minnesota BTB zone
Top 20% of farms

- "High risk" in-degree: 90% number of movements, 86% number of cattle
- "High risk" out-degree: 67% number of movements, 64% number of cattle