Diagnostic opportunities for use of *Mycoplasma bovis* antibody measurements in serum and milk

CPH Cattle conference, 15 November 2017

Mette Bisgaard Petersen, Matt Denwood and Liza Rosenbaum Nielsen
Department of Veterinary and Animal Sciences
Section for Animal Welfare and Disease Control

mbp@sund.ku.dk, md@sund.ku.dk, liza@sund.ku.dk
Why did we do it....

Photos: Mette B. Petersen
What did we want to find out....

- Dynamics of antibodies over time in cows and calves with different clinical signs
- The usefulness of a commercial IgG ELISA test for use in serum and milk for diagnosing *M. bovis* in cattle
- To establish new diagnostic guidelines
How did we do it....

- 4 dairy herds with acute *M. bovis* outbreak
  5 herd visits, approximately 3 weeks apart ~ 3 months

- 20 cows and 20 calves
  Clinically examination with a standard protocol
  Blood and milk samples collected

Analyzed for *M. bovis* antibodies with the commercial ELISA kit BioX Bio K 302 and milk samples by PCR.
Cows

• 120 cows in total

• Divided into four disease groups:
  • **Mastitis** (PCR positive)
  • **Systemic** (clinical signs consistent with/indicating arthritis)
  • **Healthy**
  • **Uncertain** (not related to *M. bovis*)

• Days from disease onset calculated
Systemic disease group

Days from disease onset

Serum ELISA ODC %
Serum ELISA response

Cows with systemic disease

Cows with no *M. bovis*-ass. disease

Days from disease onset

Serum ELISA ODC%
Milk ELISA response

Days from disease onset
Calves

• 83 calves

• Divided into three disease groups:
  • Likely *M. bovis* (arthritis and/or otitis media)
  • Respiratory
  • Healthy

• No difference between disease groups
• But different antibody patterns between herds
Different interpretation in calves

Days from disease onset

Serum ELISA ODC%
Take-home messages

- Very dynamic
- Short antibody responses
- Not useful for diagnosing individual animals
- Milk ELISA is only useful for diagnosing mastitis
- Not a useful test for calves less than 4 months
- Might be useful for group diagnostics if cut-off is adjusted
New diagnostic guidelines

• If *M. bovis* is suspected – collect serum from ill animals above four months old

• 10-15 animals and if the mean antibody measurement is >37 ODC% *M. bovis* is likely associated with the disease

• *M. bovis* associated mastitis -> short antibody response in milk -> positive bulk tank milk most likely reflects *M. bovis* udder infections
Master thesis by Jeanette Pedersen and Dinah Holm

mbp@sund.ku.dk
Thanks to a lot of people....

The participating **farmers** and their **animals**, and their veterinarians.

**Ulla Torpe** and **Martin Lund** (Dyrlægerne Egtved)  
**Lars Pedersen** (SEGES)  
Veterinarians/veterinary students **Annie Nielsen**, **Eva Elisabeth Toft-Petersen**, **Franziska Helene Pedersen** and **Signe Rejnhardt Olsen** for their assistance with the herd visits.

The study was funded by the Danish Milk Levy Fund, the Danish Cattle Levy Fund and the University of Copenhagen.