THE EPIDEMIOLOGY OF MYCOPLASMA BOVIS MASTITIS

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Introduction: Mastitis caused by Mycoplasma bovis (M. bovis) is an increasing threat on dairy farms in Europe, in particular related to increasing herd size and the purchase of infected heifers. Data on the epidemiology of this bacterium on a farm level are limited. Culling of M. bovis excreting animals is generally recommended in the literature, but this can be financially unacceptable on some farms. The future approach on positive farms is a well designed control plan based on selective culling, selective antibiotic treatment and biosecurity measures. To test such a plan, more practical knowledge on the epidemiology of this bacterium on a farm is needed.

Early detection of M. bovis mastitis herds: Early detection of M. bovis on a farm may significantly reduce the costs to control the disease. Under field conditions, most M. bovis positive herds are detected by culturing milk of animals suffering from acute mastitis, not responding to antibiotic (e.g. penicillins, cephalosporins) therapy. M. bovis mastitis is suspected when multiple quarters are affected. Most striking is a sandy sediment, brown color and rice-like structure of the cloths in the milk. Drawback of this diagnostic approach is that by the time samples are submitted, the bacterium could have spread to many other animals in the herd. Moreover, M. bovis bacteriological culture in a routine laboratory is not a part of routine diagnosis of acute mastitis cases. Using the diagnostic approach M. bovis was isolated from 48 samples (9.7%) of 553 submitted milk samples of cows with clinical mastitis in the northern part of Belgium in 2008 (Passchyn et al 2009). An alternative way to identify herds excreting M. bovis in the milk is to examine bulk milk samples. Bulk milk samples are routinely submitted to state laboratories for milk quality controls and can easily be used for M. bovis detection. Bacterial culturing of bulk milk is able to detect 1 M. bovis excreting animal in 300-400 cows, which is sufficient for most European herds (Biddle et al 2003). In a prevalence study in Belgium in 2008, bulk milk samples of 201 randomly selected Flemish dairy herds were examined 3 times at regular intervals for M. bovis. Repeated sampling is needed because the bacterium is excreted intermittently and not constant (Biddle et al 2005). Three herds were found bacteriologically positive and 22 herds were serologically positive using a commercially available ELISA test (cut-off value S/P = 0.7) (Passchyn et al 2009). Herd veterinarians should be informed about positive farms, so they can proactively investigate the farm before serious clinical outbreaks occur. In a second trial, bulk milk samples from other herds were analyzed via 3 methods: routine bacteriology using PPLO broth/agar, real-time PCR (PhatoProof Mastitis Major-3 Kit, Finnzymes) and serology (Elisa Kit Bio X K 260, Bio-X). Real-time PCR was not able to detect more positive herds than culturing. Serology resulted in more positive herds depending on the cut-off value used in the test. However, serology is also able to detect non-excreting carrier animals. The major draw-back of bulk milk testing is that the milk of cows with clinical M. bovis mastitis is usually not added to the bulk milk.

Investigational herd visit to analyze the epidemiology of M. bovis: Herd veterinarians should follow a strict investigational protocol when M. bovis is detected in a herd. A protocol using a checklist was developed by De Schutter (2010) and tested on 2 herds. The checklist covers the following topics: general udder health, environment of the cow, milking process, maintenance of the milking machine, treatment plan for clinical mastitis, dry-off management, biosecurity plan, cause of the infection, clinical signs of the mastitis, other M. bovis signs than mastitis and prevention of spread of the infection. The result of the investigational herd visits is given below. Herd 1, (48 dairy cows): on January 27th 2010, three milk samples were submitted for bacteriology. M. bovis was cultured from 2 of 3 samples. Subsequently, milk samples of all lactating cows were taken and analyzed for bacteriology and serology on February 3rd. During the herd visit, the results were discussed with the farmer: all but one cow had M. bovis Elisa antibodies in the milk and 5 cows were positive on culture. Two of the 5 positive cows only had moderate antibody response suggesting a recent infection. This was confirmed by high antibody response in a new milk sample taken March 3rd. All cows positive on culture had calved between September and December 2009. 5 of the 6 cows developed within 1 to 3 months after calving an acute mastitis of 2 up to 4 quarters. The 6th animal developed no clinical signs. One cow had positive bacterial milk culture. This animal was according to the farmer clinically healthy and should be considered an excreting carrier animal, presenting a threat to other dairy cows (horizontal transmission via the milking machine) but also to her offspring (vertical transmission via milk or colostrum).

General recommendations: Farmers and veterinarians should be more made aware to react firmly and quickly in case of a suspicion of M. bovis infection to avoid further spreading of the bacteria within the dairy cows and towards their offspring. A
combination of selective culling, selective antimicrobial use and biosecurity measures (hygiene during milking including post-milking teat disinfection) should be installed, accompanied by a follow-up monitoring via bulk milk sampling and serology. Unpasteurized milk should not be fed to calves. Screening via bacterial culture and/or serology of newly purchased animals could contribute to prevent *M. bovis* from entering a negative herd.

**Key words:** bovine, mastitis, Mycoplasma, epidemiology.

**References:**


