

## Within-herd transmission of *Mycoplasma bovis* infection in 20 Dutch dairy herds

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Even though *Mycoplasma bovis* is an emerging disease in Western Canada, causing recent outbreaks on dairy farms across Alberta, understanding outbreak dynamics remain limited and inconclusive. Detailed, quantified information about how and at what rate *M. bovis* spreads on-farm between age groups is lacking, whilst being critical for outbreak control. We, therefore, aimed to estimate the within-herd transmission of *M. bovis* and the most likely transmission pathways between calves, youngstock and cows using an age-stratified SIR model on 3 individual test results and identify potential risk factors explaining transmission patterns using a Fisher's exact test. A cohort of the 3 cattle age groups on 20 Dutch dairy farms with a clinical outbreak of *M. bovis* in adult cows was sampled 5 times during a 12-week period. Transmission from cows was associated with median reproduction ratios of 28 (95%CI: 4 – 55), 27 (95%CI: 4 – 30) and 30 (95%CI: 3 – 46) secondarily infected cows, youngstock, and calves per herd. Transmission from youngstock with 7 (95%CI: 2 – 46), 3 (95%CI: 0 – 74) and 2 (95%CI: 0 – 60) secondarily infected youngstock, calves and cows per herd, whereas transmission from calves with 8 (95%CI: 2 – 39), 6 (95%CI: 2 – 15) and 9 (95%CI: 0 – 46) secondarily infected calves, youngstock and cows per herd. Mean duration of the outbreaks ranged from 5.3 to 55 weeks across the 20 herds. Most important pathways were transmission from cows to youngstock, calves and cows, but also pathways from calves to calves and youngstock, and youngstock to youngstock (>50% of the farms) occurred frequently. Risk factors could be related to internal biosecurity (number of people involved in caretaking), external biosecurity (contractors, external employees) or indirect transmission routes (number of feed and water stations).

**Take home message:** This study demonstrates that *M. bovis* can spread incredibly fast, with most transmission originating from cows to cows, youngstock and calves. However, transmission to and amongst calves and youngstock should not be ignored, given their relevance in many on-farm outbreaks.

## Effect of selective clinical mastitis treatments on cure, somatic cell count, recurrence and culling: Systematic review and meta-analysis

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**Objectives.** Clinical mastitis (CM) treatments greatly contribute to antimicrobial use on dairy farms. Selective treatment of CM can reduce antimicrobial use, as only CM cases identified as Gram-positive benefit of antimicrobial treatment. Impacts of selective CM treatment on udder health and culling are not fully understood. **Methods.** A systematic search identified 12 studies that compared selective versus blanket CM treatment protocols. Reported outcomes were synthesized with random-effects models and presented as risk ratios (RR) or mean differences (MD) with their 95% confidence intervals (CI). **Results.** A selective treatment protocol of CM was not inferior to a blanket treatment protocol for bacteriological cure (RR 1.09; 95% CI: 0.87 – 1.36). Cases in the selective treatment group experienced a higher clinical cure within 14 d (RR 0.75; 95% CI: 0.58 – 0.97) and 0.4 d longer till clinical cure (95% CI: 0.19 – 0.69), but these results were confounded by co-administration of NSAIDs in this group compared with no use of NSAIDs in the blanket treatment group. Furthermore, there was no difference between selective and blanket treated CM cases for: proportion that developed another intramammary infection within 21 d (RR 0.96; 95% CI: 0.81 – 1.14), proportion with high somatic cell count after 21 d (RR 1.00, 95% CI: 0.94 – 1.06), average somatic cell score (MD 0.04; 95% CI: -0.10 – 0.11), average milk yield (MD 0.34, 95% CI: -0.67 – 1.35), recurrence (RR 0.91; 95% CI: 0.73 – 1.13) and culling (RR 0.87; 95% CI: 0.70 – 1.08). However, for these parameters non-inferiority margins could not be determined. **Conclusions.** When comparing cows treated with a selective to a blanket CM treatment protocol, no differences were identified in bacteriological cure, clinical cure, intramammary infection risk, milk yield, somatic cell count, recurrence, and culling.

**Take home message:** Available data support that a selective CM treatment protocol can be adopted without negative udder health consequences.