

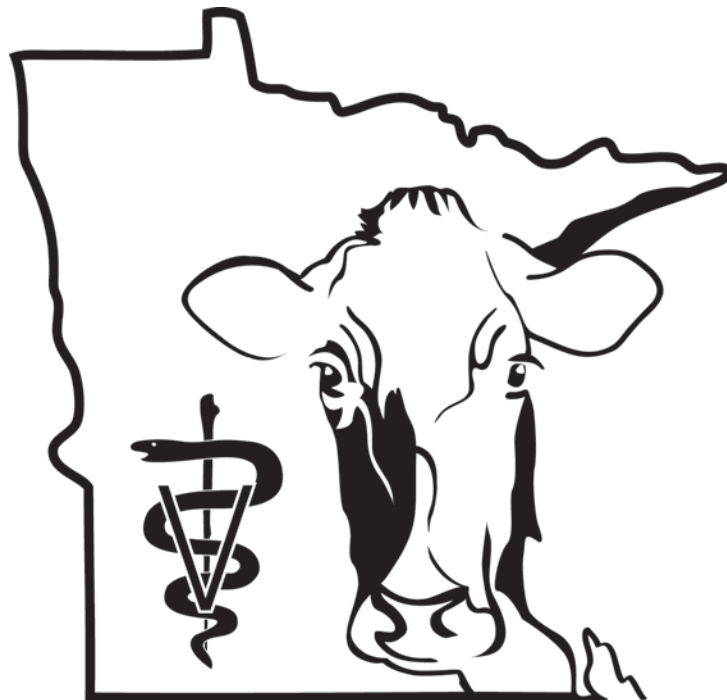
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Risk of detecting *Mycobacterium avium subsp. paratuberculosis* DNA in colostrum and on teat skin of Holstein cows in Johne's disease infected herds

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Abstract

The objective of this study was to describe the relationship between fecal shedding of *Mycobacterium avium subsp. paratuberculosis* (MAP) around calving time and detection of MAP in colostrum samples and on teat skin surfaces, respectively.

Fecal samples collected within 48 to 72 h prior to actual calving, colostrum (composite sample from all 4 quarters of the udder) and teat swab samples collected immediately after calving from 112 cows in 4 Johne's disease (JD) endemic herds, were tested for MAP using the conventional bacterial culture method (fecal samples) and a nested PCR targeting the genetic element ISMAP02 (colostrum and teat swabs samples), respectively. Logistic regression modeling was used to evaluate the relationship between MAP fecal shedding status (positive/negative) and MAP detection in colostrum samples or teat swabs. Population attributable fractions (PAF) describing the proportion of colostrum and teat swab samples positive for MAP attributable to fecal shedding status of the donor cows were calculated from the odds ratios (OR) derived from the logistic regression models.

The OR for detection of MAP in colostrum samples or teat swabs in fecal culture positive (vs. fecal culture negative) cows were 2.02 (95% CI: 1.32, 3.10; $P < 0.001$) and 1.87 (95% CI: 1.18, 2.97; $P < 0.008$), respectively. These findings suggested that in practice, withholding colostrum collected from MAP fecal culture positive cows might reduce the risk of exposing calves to MAP through ingestion of colostrum by 18.2% (PAF) and that limiting the chances of natural nursing by calves might reduce the risk of exposing calves to MAP present on teats of MAP fecal shedding dams by approximately 19.5% (PAF). However, it was also found that while the latter interventions might achieve some reduction in risk of exposure to MAP, they by no means eliminate the risk of exposing calves to MAP through ingestion of MAP present in colostrum or on bovine teats in JD endemic herds, given that a greater proportion of MAP detected in the colostrum samples and teat swabs had sources unrelated to the fecal shedding status of the donors. These findings underscored the need for strict adherence to practices that limit contact of calves with adult cows from the time of birth and to practices that promote hygienic colostrum handling to avoid possible contamination during harvest, storage or feeding.