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Reduction in transmission of Johne's disease in the Minnesota Johne's disease demonstration dairy herds

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Certain management practices have been recommended to minimize transmission of Johne's disease between infected and susceptible cattle. The objective of this study was to evaluate the risk of testing positive and its association with changes in recommended management practices in different birth cohorts. Eight dairy herds and approximately 6,000 cows were enrolled in the Minnesota Johne's Disease Demonstration Herd Program. Herds were monitored for a period between 5 to 10 years. Annual testing for *Mycobacterium avium* subsp. *paratuberculosis* was performed for all cows that calved, using bacterial culture and serum ELISA. Risk assessments were performed annually to measure the level of implementation of the recommended management practices. Eight birth cohorts were defined based on the date of cow enrollment in the program. Birth cohorts -2 and -1 corresponded to cows that were born 2 and 1 year before the beginning of the program, respectively, and cohorts 0 to 5 corresponded to cows that were born 0 to 5 years after the beginning to the program. The annual risk assessment score was used to quantify the level of exposure by birth cohort and herd. A time dependent Cox's regression model was used to model the time to test positive, explained by herd, birth cohort and birth cohort exposure level. Compared to birth cohort -2, there was a reduction of the hazard ratio of serum ELISA positivity of were 0.99, 0.70, 0.55, 0.35, 0.23, 0.17 and 0.05, for birth cohorts -1, 0, 1, 2, 3, 4, and 5, respectively. Similar results were obtained for bacterial culture of feces. The instantaneous hazard of testing positive for both tests increased with the level of exposure, however, the strength of this association decreased with age of the cows. There was a reduction in the transmission of Johne's disease associated with the level of implementation of the recommended management practices.