CASE-CONTROL STUDY: PRODUCTIVITY AND LONGEVITY OF DAIRY COWS THAT TESTED POSITIVE FOR INFECTION WITH MYCOBACTERIUM AVIUM PARATUBERCULOSIS AS HEIFERS COMPARED TO AGE-MATCHED CONTROLS

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Objective: A case-control study was performed using cattle from 4 dairy herds in Michigan, USA, to compare the productivity and longevity of dairy cows that had tested positive for Mycobacterium avium paratuberculosis (MAP, the causative agent of Johne's disease (JD)) as heifers compared to age-matched controls.

Materials and methods: Cases were defined as cows that had tested positive for MAP by fecal culture or serum ELISA as heifers in a previous study. Each case was individually matched to 4 controls. To ensure the cases and controls were similar in age, MAP exposure, and management, the controls were the 2 heifer calves born immediately prior to and after the case on each herd. Data was collected from April 2004 through August 2009. Survival analysis was used to determine if there was a difference in time spent in the herd between cases and controls. Conditional logistic regression was used to assess differences in mean production indices, adult JD test status, removal from herd during the observation period, and MAP test status of dam between cases and controls.

Results: A total of 25 cases were identified, resulting in a total study population of 125 cows. As adults, 5 (23%) cases and 17 (17%) controls tested positive for MAP by either FC or serum ELISA. A total of 11 (44%) cases and 39 (39%) controls were culled from the herds during the observation period with only 1 case and 3 controls being culled due to clinical signs of JD. On survival analysis, the mean number of days in the herd for cases was 1591 (95% CI: 1422-1761) while that for controls was 1711 (95% CI: 1623-1799); however this difference was not statistically significant (p=0.43). Conditional logistic regression revealed no statistically significant difference between cases and controls in terms of mean 3.5% fat corrected milk, fat, or protein produced, linear somatic cell count, MAP test status as adults, or being culled during the observation period. The only statistical difference found was cases were 4.5 (95% CI: 1.6-12.9) times more likely to have a MAP positive dam than controls.

Conclusions: Based on these results, it appears the MAP test status of young dairy heifers using available FC and serum ELISA tests is not a reliable indicator of true MAP infection status or future impaired performance.

Keywords: Johne's disease, paratuberculosis, dairy, longevity