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Environmental Sampling for Johne's Disease

EA Raizman, DVM, and SJ Wells, DVM, PhD
Department of Veterinary Population Medicine
University of Minnesota, St. Paul, MN

Results from a recent study at the University of Minnesota indicate that testing of fecal samples from the environment of dairy cattle can be an efficient method of detecting herds infected with Johne's disease. The objective of this study was to characterize the distribution of *Mycobacterium avium subsp paratuberculosis* (Map) in the environment of infected and uninfected Minnesota dairy farms. One hundred and eight Minnesota dairy herds were sampled during the summer season, including 80 herds known to be infected based on previous testing in the Minnesota Johne's Disease Control Program (JDCP) and 28 herds known to be uninfected based on previous testing in the Voluntary Johne's Disease Herd Status Program (VJDHSP). Fecal samples were obtained from up to 100 cows in each herd and were cultured in pools of five cows per pool as additional confirmation of herd infection status. Two environmental samples (fecal material with bedding and other materials) were tested using bacterial culture from cow alleyways, manure storage, sick pens, and other farm locations. Each sample tested was a pool of 4 samples collected from each farm location.

Sixty-four of the 80 JDCP herds (80%) had at least one positive pool; 16 of these herds did not have any positive pools. The farm environment was determined to be culture-positive on 61 of the 64 (95%) herds with at least one positive pool and in one of the 16 JDCP herds with no positive pools. Twenty-six of the 28 VJDHSP herds (93%) had no positive pools; 2 herds had one positive pool each. One environment sample from these herds was also cultured positive.

The farm environment was culture-positive in samples from cow alleyways (77% of the culture-positive herds), manure storage (68%), calving area (21%), sick cow pen (18%), edge of streams and water runoff (6%), and postweaned calves area (3%), but not in preweaned calves or fields near cow area.

There was an association between maximum level of colonies per tube from cow alleyways and manure storage and fecal pool prevalence. Herds with at least one high bacterial load culture-positive sample from both cow alleyways and manure storage were estimated to have 53-73% fecal pool prevalence. Herds with no culture-positive samples from cow alleyways and manure storage were estimated to have 0.3-4% fecal pool prevalence. These study results indicate that targeted sampling of cow alleyways and manure storage may be a useful alternative strategy for herd screening and Johne's infection status assessment and for estimating herd fecal prevalence.