

Significance

Even though CKB-01 has made progress in controlling JD, it still has significant economic impact on the operation. The goal is to continue to reduce the incidence of the disease to the point that it becomes economically insignificant.

The goal of the SPS-01 farm for Johne's is to eliminate the infection in five to seven years. The expectation is that the herd is past the period of peak infection and transmission, occurrence of clinical cases on the farm will be rare in 2006, replacements born after 2002

are low risk for infection and annual prevalence will begin to decline 2-5% per year.

The significance of these demonstration herds will be to show that farm-specific control programs customized to the goals and unique situation of particular farms will be successful at reducing JD to targeted and/or negligible levels provided the plans are feasible for the farm, target the appropriate risks, are monitored, and the producer commits to carrying out their plan. These farms also recognize additional positive impacts on performance due to a generally increased focus on health and biosecurity.

Low *Mycobacterium avium* subspecies *paratuberculosis* ELISA Specificity in a Dairy Herd

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Introduction

Johne's Disease (JD) is an important infectious disease of cattle caused by *Mycobacterium avium* subspecies *paratuberculosis* (MAP). It is estimated that over 50% of US dairy herds are infected with MAP. Current JD diagnostic tests detect either an immune response to MAP or the actual organism in feces or tissues. The JD ELISA detects antibodies to MAP and is the most common assay used to detect an MAP immune response. Because of the pathogenesis of JD, the sensitivity of the JD ELISA is reported to be less than 50% when used to detect JD infected adult cattle. The specificity of the JD ELISA is reported to be greater than 90%. However, the assay specificity may vary significantly between herds. In this case study, low MAP ELISA specificity in an individual dairy herd is described.

Materials and Methods

The subject of this investigation was a ~110 lactating cow dairy herd located in north central Michigan. The herd was part of a larger study investigating

the affects of MAP on diagnostic tests for bovine tuberculosis (BTB). At the initiation of this study, rolling herd average milk production was ~21,000 lbs (9545 Kg) . Replacement heifers were raised in calf hutches, and then moved to group housing in a covered barn. Lactating cows were housed in a free stall barn with access to an outside concrete and dirt exercise lot. Feedstuffs were stored primarily in upright silos and as large round bales and fed as a total mixed ration.

Testing for JD was conducted by the Michigan State University Diagnostic Center for Population and Animal Health, which is fully accredited by USDA NVSL to perform MAP ELISA and culturing. The ELISA used in this study was the Biocor Parachek (Biocor Animal Health). Fecal culture was conducted by standard culture on Harold's Egg Yolk media.

Testing of all animals two years of age was conducted initially in the winter of 2002 by both ELISA and fecal culture. In accordance with the protocol of the larger umbrella project, samples for both MAP ELISA and culture were collected 72 hours apart in conjunction with BTB caudal fold testing. Independent JD testing was repeated in the summer of 2002. Following this, annual testing has been conducted in accordance

with the requirements of the Michigan Voluntary Johne's Disease Control Status Herd Program.

Results

Prior to and during this investigation, the herd owners and veterinarian reported no clinical evidence of JD. In the winter of 2002, 32/107 (29.9%) and 33/107 (30.8%) animals tested positive by ELISA on testing conducted 72 hours apart. No animals were positive by fecal culture. In the summer of 2002, 17/115 (22.6%) animals tested positive by ELISA while once again, no animals were positive by fecal culture. At this time the herd was granted JD Status level 2 by the state of Michigan. In 2003, 30 animals were tested by the JD ELISA. No animals were found to be positive. In 2004, a whole herd ELISA was conducted on all animals three years of age and greater, and 5/71 (7.0%) animals were classi-

fied as inconclusive by ELISA. No MAP was isolated by culture from these animals. In the winter of 2005, 5/30 and 1/30 animals were ELISA inconclusive and positive, respectively. Again, no MAP was isolated by culture. In the winter of 2006, 1/30 and 1/30 animals were ELISA inconclusive and positive, respectively. No MAP was isolated from these animals.

Significance

The JD ELISA is an inexpensive and convenient diagnostic test for use in a JD control program. However, although reported as being relatively high, the specificity of the test may be low on individual herds and may vary over time. Veterinarians should make an effort to confirm the specificity of ELISA results by periodically testing ELISA positive cows by fecal culture.

Quantifying Johne's Disease Infectivity in Dairy Herds in Indiana

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Introduction

Infectivity is a critical parameter that determines how Johne's Disease agent (*Mycobacterium avium* subspecies *paratuberculosis*, MAP) survives in the population. Infectivity, in conjunction with contact rate, determines the numbers of new infection and, therefore the incidence and prevalence of infection in the population.

Materials and Methods

Epidemiological analysis of fecal culture and ELISA serology results for JD were conducted on four dairy herds.

Results

Various positive management practices have been used to reduce the prevalence of JD in the herds, except for the fourth herd. In a large, open Holstein herd (900 milking), JD prevalence by semi-quantitative fecal culture was 28.9% in 2004 and 18.2% in 2005. 3.3% of cows were positive for JD by ELISA in 2004, and 7.4% of cows were ELISA positive in 2005. Two small, closed herds (50 milking) were studied. In one herd, 15.6% of cows were positive for JD by fecal culture in 2004, and only 7.5% of cows were positive by fecal culture in 2005. The number of ELISA positive cows doubled from 2004 to 2005 (47.6%). In the other small herd, 4% of cows were JD positive by fecal culture in 2004; only 2% were