

Vermont's Two National Johne's Demonstration Herds

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Introduction

Vermont has two National Johne's Demonstration Herds which intend to show how customized on-farm control programs can target the appropriate risks in commercial dairies and be effective at reducing Johne's disease (JD) over the course of 2-4 years. The herd veterinarian, a facilitating veterinarian associated with the Vermont Cattle Health Improvement Project, and key management and employees regularly participate in the activities of these demonstration farms.

Materials and Methods

Two herds were enrolled in 2004 from the Vermont Cattle Health Improvement Project. Herd veterinarians are involved on a weekly or biweekly basis, environmental samples are taken every 3-4 months and there is an annual review and risk assessment, in addition to less formal meetings of the team.

CKB-01 is a several generation family-owned commercial Holstein dairy herd in northern Vermont, adjacent to the Canadian border. The farm has existed 60 years and had a series of expansions to 700 milking cows through purchased additions during the mid- to late-1990s. The first experience with JD occurred in 1999, followed by a significant increase in clinical cases, particularly first lactation cows. During this time the herd also experienced other health problems, including a significant outbreak of salmonellosis and 'Leptospira hardjo'. At its peak, the herd experienced an estimated 3-4% clinical case rate in both raised and purchased cattle. An estimated 10% of culls were due to JD. Owners began implementing management changes that focused on management of the calving area by improving hygiene and sanitation, prompt removal of newborn calves to an isolated area and restricted colostrum feeding. Significant management changes over the past five years have included a new transition cow facility, separating higher risk cows to another barn, consolidating heifer raising on another farm and more aggressive testing, including initiating fecal culture of cows prior to dry-off.

Vermont's second demonstration farm, SPS-01, is a 375-cow commercial Jersey herd that purchased 200 cattle from 1998 through October 2001. The first suspected case of JD was circa 1992-93 in a cow of unknown

source. Two cows of unknown source cultured positive in July 2000. Seven cows, two purchased, were culled as clinical suspects in 2001. October 2002, a three-year-old home raised cow was culled as a clinical suspect. The herd enrolled in the VT Cattle Health Improvement Program in 2003 and developed a management and testing plan. Main transmission risks through expansion years and prior to 2001 included cow refusals fed to young stock, a high proportion of calves born in the pre-fresh free stall, calves housed in the cow barn with high mortality, poor colostrum and transition milk hygiene. A new calf barn was constructed in fall 2001. The owner's wife began raising calves and all refusal feeding stopped in 2002. The most effective management practices implemented since 2001-2002 include immediate segregation of newborn calves to a calf barn, well managed individual calving pens, strict colostrum hygiene, strict feeding management and biosecurity for young stock, no contact with adult cows until 16 months, heifer calves with high risk of exposure at birth have not been raised (constraint imposed by size of calf barn), and serology and fecal culture of all cows 2-3 months prior to dry off. Test results are used to manage higher risk cows and/or cull prior to dry-off with pre-dry-off culling being quite aggressive in 2005.

Results

While several risk challenges still exist for the CKB-01 operation, namely the purchase of outside additions of unknown source and status and the reluctance to cull known shedders until they become clinical, the Johne's clinical case rate has decreased to about 2%, accounting for 6% of annual culls. Serological test prevalence has decreased from 10% to less than 5%.

In herd two, SPS-01, the estimated number (% of annual herd) of clinical Johne's cases that occurred on the farm was 17/443 (3.8%) in 2003, 19/476 (4.0%) in 2004 and 4/482 (0.8%) in 2005. Estimated prevalence based on fecal culture was 44/312 tested (14%) in 2004 and 67/346 tested (19%) in 2005. Cows born in 2001 have been high risk for testing positive or becoming clinical. Environmental sampling to date has never yielded a positive from the maternity pen or any young stock pen, including a commingled group of older heifers and dry cows.

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