

Johne's Disease Testing on Colorado Dairies

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In 1998 Dr Frank Garry, ILM Coordinator, spoke at the Large Western Dairy Conference in Las Vegas, on Johne's Disease (JD) and encouraged producers to test their herds for JD. Interest in this topic was sufficient that he also traveled the state of Colorado the following year discussing JD with small groups of producers. As a result of these educational meetings, the ILM research group on infectious diseases headed by myself has been to test sixteen dairies in Colorado for JD.

The aim of this project is to estimate the occurrence of JD in Colorado and calculate some risk factor(s) that might lead one to suspect that a dairy has JD infected cattle. The test used at Colorado State Diagnostic Laboratory was the IDEXX ELISA. This test is a good screening test because it is inexpensive, results are quick and the sample can be run on blood (plasma). But the test also has its limitation: It does not provide accurate results in animals less than 2 years old. In cows greater than 2 years of age accurate the ELISA will only detect approximately half of the infected animals on any one day. This will occur when cows that are actually infected do not have a positive test result (ie false negatives). Also the ELISA test may be positive erroneously for 2-3% of the cows tested on any one day. This result is classified as "false positive". Producers should be aware that some test positive cows are not infected. For culling purposes cows that are test positive and show clinical signs of JD are the most likely truly infected animals.

Herd testing involved collection of a single blood tube from the tail vein of cows. At each participating dairy we tried to test all cows over 2 years of age in one day. Larger herds required up to 3 days for testing every animal over 2 years of age.

Approximately 10,000 cows were tested during 1999 and 2000. When evaluated as a large group, less than 5% of these cows were tested positive and more than 85% were clearly test negative. The remaining (<10%) fell into a suspect range. Individually, the dairies had between 0 and 8% test positive cows on their dairies with most dairies having less than 3% of their cows test positive.

Herd size, cow environment, calving management, young stock management, source of herd replacements, varied in the 16 dairies we tested. To enable the dairy producer to use the data practically, we evaluated the test results against two variables: herd size and presence of cows with clinical JD on the dairy within the past 5 years. Clinical JD was defined as cows with weight loss, decreased milk production, diarrhea (intermittent or constant) that does not respond well to treatment, lack of fever, and good appetite until severe weight loss leads to anorexia. Producers were asked if they had treated or culled cows that showed these clinical signs. Of the dairies tested about half had cows with symptoms of JD while the other half of the dairies did not.

Using statistical analysis of the data collected from 16 Colorado dairies, we found that **larger herds** were associated with a **greater percentage of test positive cows** in comparison to smaller herds. We also found that dairies who reported to have had cows with clinical signs similar to JD had a **greater percentage of test positive cows** in comparison to herds that had NOT reported having cows with clinical signs similar to JD.

Following the whole herd test, we returned to dairies to collect fecal samples from positive and suspect ELISA animals. The fecal test can be used to confirm infection in cattle because a positive is always a TRUE positive (no false positives). However, we have found that the majority of ELISA positive animals will be negative with a single fecal culture (unless they have outward symptoms of the disease). This is because the fecal culture can only detect 50% of infected animals on a single test (same as the ELISA). We used fecal culture on many of the 16 dairies to confirm whether we could detect cows infected with the JD bacteria or not. Since the fecal culture costs about \$15/cow, we had to select a small population of cows for this purpose and felt that the ELISA positive and suspect animals might be more likely to be shedding the JD bacteria in feces than ELISA negative animals. Over 50% of herds that submitted fecal cultures had at least one positive result.

In summary, we have confirmed evidence of JD on many of the sixteen dairies we tested in Colorado. These dairies have been offered advice on management procedures to reduce the spread of JD in their herds. To be effective these suggestions must fit into business goals of the dairy. A few of the herds are retesting cows at dry off with the purpose of identifying new positives at a convenient management point. A few of the herds have culled ELISA positive cows when they drop in milk production instead of breeding them back (“do not breed” status. Dairies that did not confirm positive fecal shedders are not confirmed “free” of JD but would require more extensive and repeated testing with ELISA and fecal culture to become “low risk” JD herds. We expect the Colorado Johne’s Advisory Committee and the State Veterinarian’s office to announce an official voluntary control program in the near future.

We would like to thank the dairy producers who participated in this study for making available an overview of the prevalence of JD in Colorado dairies. Any questions about testing your herd for JD or revising your JD control program can be addressed to Heather Hirst or Frank Garry of the ILM program.