

Johne's Disease in Colorado: Recent Findings

The Integrated Livestock Management group (ILM) began working on Johne's disease (JD) in 1996. Most Colorado dairy producers were unfamiliar with the disease, and there were almost no control efforts in the state. Since then, the CSU Diagnostic Laboratory and the Rocky Mountain Regional Animal Health Laboratory have dramatically improved testing and reporting services. Via informational articles and seminars, dairy producer awareness about JD has improved. The Colorado Johne's Advisory Committee was established and has been developing guidelines for voluntary identification and control programs.

Equally important, is the need to better understand the disease and methods for its control in Colorado. The extremely slow growth of the disease agent, *Mycobacterium avium* paratuberculosis (MAP), and the very slow progression of disease signs make the disease difficult to characterize both for diagnosis and for research purposes. Despite these difficulties, research funding is scarce.

We are making good progress understanding JD for three reasons:

- 1) the collaborative efforts of individuals in 5 departments at CSU, especially Drs Heather Hirst and Greg Goodell;
- 2) the participation of numerous Colorado dairy producers, who have helped make animals available for testing, supported testing costs, and provided access to their herds; and
- 3) generous private donations by dairy producers to ILM. To all of these people we are very grateful.

Drs. Hirst and Goodell recently reported results from their studies of JD in Colorado dairies. No previous survey of JD has ever been performed in our state. In one study, all cows were sampled from 15 herds, representing approximately 10,000 cows. Based on serum testing for antibody response to MAP, approximately 4% of all cows were positive. The occurrence of positive cows within a herd ranged from 0 to 7.8%. Assuming that this test only detects about half the infected cows, this approximates infection rates between 0 and 15%. There was a strong relationship between size of the herd and the percent of positive cows in the herd, a finding that supports results of the NAHMS 'Dairy '96' study (September 1998 Colorado Dairy News). Herds expanding by purchasing cows increase their risk of importing JD into the herd. Furthermore, herds with a higher percentage of positive cows have a much greater likelihood of clinical disease losses. Herds where clinical JD was not seen or diagnosed had an average of < 2% test positive cows, while herds where JD was diagnosed and cows were lost to the disease averaged > 4%. Thus, in Colorado dairies, herds where clinical cases are not seen may have infected cows, but at a low percentage of the herd. Herds with higher infection rates are more likely to lose cows to the disease, and thus have higher economic losses. Repeat testing of cows over prolonged time (about 1 year) showed that test status changes often due to changes in the cow's response to the infection. This means that cows must be tested repeatedly over time to detect infection, much like the well-known TB test, because a single test result does not remain the same indefinitely.

The performance of tested cows is also being monitored. Serum test positive cows were about 60% more likely to be culled within the year after the test compared to test negative cows. In this study, culling was due to health problems or poor production, and not the test result. The test positive cows also produced about 1,000 lbs less milk in the next lactation. Thus, an individual test positive cow may still be profitable for the dairy, but increased numbers of test positive cows in the herd will produce financial losses due to increased culling and reduced production.

Other research efforts are ongoing. These include comparisons of fecal culture testing with serum testing, evaluation of the current serum tests, development of new testing methods, development of new methods to detect MAP in animal tissues, and economic costs of the disease in Colorado dairies. As these results become available we will update in future editions on this newsletter.