



Quality Watch

By Dean Letter

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Johne's Disease—The Silent Thief

With milk prices being as low as they have been over the past several months, dairy producers have to make tough decisions regarding where to spend their limited resources. The primary profit center on any dairy farm is milk production, namely, the cows. Herd health is as important today as it has ever been. Producers are keenly aware of the importance of proper nutrition and good mastitis management to herd health and high milk production. Awareness of diseases such as Johne's disease is not high because there are no acute outbreaks with this chronic disease. In fact, there are no clinical signs of the disease until its later stages. Because this disease develops below the level of awareness, the financial losses from this disease are often not considered.

The Center for Epidemiology at the U.S. Department of Agriculture estimated the economic loss associated with Johne's disease. Dr. Stephen Ott reports, "... herd productivity and corresponding economic loss on U.S. dairy operations was part of the USDA National Animal Health Monitoring System's (NAHMS) 1996 national dairy study. Johne's-positive herds experience an economic loss of almost U.S. \$100 per cow when compared to Johne's-negative herds due to reduced milk production and increased cow-replacement costs. For Johne's-positive herds that reported at least 10 percent of their cull cows as having clinical signs consistent with Johne's disease, economic losses were over U.S. \$200 per cow. These high-prevalence herds experienced reduced milk production of over 700 kg [~1,500 lb] per cow, culled more cows but had lower cull-cow revenues, and

had greater cow mortality than Johne's-negative herds."

Do you know if your herd is infected with Johne's disease? Chances are pretty good that it is. Michigan State University conducted a study called "Prevalence of Dairy Herds Infected with Johne's Disease in Michigan as determined by Environmental Sampling." The outcome of the study indicated that the calculated true prevalence of dairy herds infected with Johne's disease in Michigan is just over 48 percent (with a margin of error of 10 percent). Infected herds were found equally distributed across the state. In this study, Johne's disease was found on all herds that purchased cows within the past five years or had over 200 cows (chances are that most of the larger herds have purchased cows in the past five years). Since nearly half of the herds in Michigan probably have Johne's disease, if your neighbor's herd does not have the disease, yours probably does. *See story on page 20 to learn one farm's struggle with the disease and what MSU researchers are doing to help producers control the disease.*

For those producers initiating a Johne's management/eradication program, Antel-Bio may suggest a random statistical sampling of the herd to determine whether or not Johne's is present in the herd, especially if there are no clinical signs observed in the herd. If all the cow samples in the statistical sampling are found to be negative, the herd MAY be free of Johne's. If any of the samples are positive, the results only indicate the presence of Johne's. It does not indicate how widespread the disease is

(prevalence). Ideally, to get a better handle on the prevalence of the disease in a herd, the whole herd needs to be sampled within a relatively narrow window of time (within four to six weeks). However, another option during this economic downturn is to sample cows just prior to dry-off. In time, producers will get an indication of disease prevalence. Knowing the prevalence of the disease is useful in developing a disease management/eradication program.

MMPA has partnered with Antel-Bio to offer our members Johne's testing. Antel-Bio offers the Milk Enzyme-Linked Immunosorbent Assay (ELISA) for cows, the hyper ELISA for bulk milk screening, the Milk Mpara-teQ (Polymerase Chain Reaction-PCR) for cows or tanks, and the Fecal Mpara-teQ (PCR) tests. ELISA and PCR are two different types of tests. Each test has pros and cons regarding cost, speed, specificity and sensitivity. Sensitivity is the ability of a test to correctly identify a sample as positive. A highly sensitive test has few false negatives. Specificity is the ability of a test to correctly identify a sample as negative. A test with high specificity has few false positives. All the tests I am referring to today result in few false positives while allowing for more false negatives.

The ELISA test detects antibodies (cow's immune response); the test indicates that the cow has been exposed to Johne's. The PCR test detects bits of the Johne's DNA, indicating the presence of the pathogen. Each of these tests has high specificity and moderate sensitivity (few false positives with some false negatives).

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one of the most critical steps in preventing disease transmission, even though measuring immediate results from changing management practices is difficult.

“Even though we culled a number of animals during the first two years of the project, we still need to manage for the disease because we know some of the older animals are carriers,” Schalk says.

Visually identifying the Johne’s carriers helps Schalk manage the disease. Schalk now tags all animals that test positive for Johne’s disease with a special red neck chain. Any heifers born to positive dams are also tagged with the red neck chain until they receive a negative test reading.

“It is not perfect,” Schalk says. “Occasionally an animal is born early in the close-up area and not in the assigned calving pen, but we are really making progress.”

Animals can shed the organism that causes Johne’s even if they are not showing clinical signs of the disease. Research indicated that the disease-causing organism is shed through the manure. So Schalk implemented another critical management practice—taking preventive measures to ensure that no manure comes in contact with animal feed.

To prevent cross-contamination, the Schalks bought a second skid steer and use one only to clean and scrape manure and the other only to handle and move feed. They also make sure not to cross over feed alleys with equipment to minimize the risk of any manure on the tires coming into contact with the feed.

Since the Schalk herd became part of the Johne’s demonstration project, the prevalence of Johne’s in the herd has dropped to less than 5 percent. The results

on this herd are similar to the outcomes realized by the other test herds.

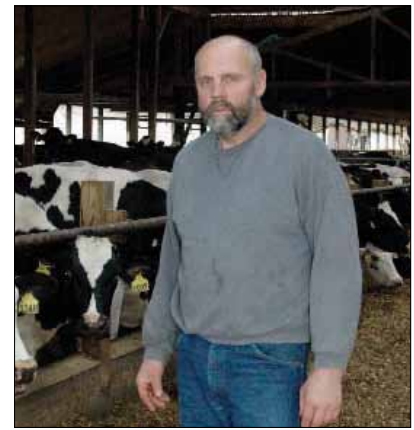
“We saw a reduction in the number of Johne’s-positive animals in all the herds we worked with,” Grooms says. “This project shows us that, though there is no cure for Johne’s disease, with proper management

farmers can prevent the spread of the disease on their farms and reduce its prevalence over time.”

As the demonstration project winds down, Schalk is looking ahead to how he will continue implementing the recommended management practices on his farm. Now that he has the prevalence rate down to less than 5 percent, he will continue to test the herd to monitor for any new infections.

“We were surprised to learn that we had the disease at all. If we don’t continue to test the herd, we won’t know if we’re continuing to make progress,” Schalk says.

Funding for Grooms’ position with an emphasis on cattle disease management was made possible by the Animal Agriculture Initiative (AAI) at MSU.



Galen Schalk worked with MSU researchers to reduce his herd’s Johne’s prevalence rate from 42 percent to 5 percent.

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The Milk ELISA test is relatively economical (\$6 to \$8) and has a quick turn-around of 2 to 5 days. The milk PCR costs about \$40 and the Rapid Fecal Test (PCR) costs more (\$30 to \$100). The turn-around times on the PCR test are a bit longer than the ELISA tests, taking up to two weeks to get results. Additionally, the ELISA methods detect whether a cow has been exposed to Mycobacterium paratuberculosis (the causative agent for Johne’s disease) whereas the PCR methods detect whether the Mycobacterium paratuberculosis organism is actually present. Because these tests detect different attributes of Johne’s (cow’s immune response versus the actual

pathogen), on particularly valuable cows, it may be beneficial to follow up a questionable ELISA test result with a PCR test.

MMPA also offers a Johne’s Risk Assessment Tool that is available through your member representative. This tool estimates the degree of risk your herd has to having the disease. The tool also highlights which management changes can be instituted to break the disease cycle. Producers are often encouraged to test their herds to identify test-positive cows so that they can be managed differently from test-negative cows. If you are interested in testing samples for Johne’s, please contact your MMPA Member Representative for the milk

sampling protocol. Milk samples can be sent to Antel-Bio via your milk hauler. Fecal samples must be sent directly to the Antel-Bio laboratory.

Antel-Bio is willing to work in conjunction with dairy producers and their veterinarians in developing an effective Johne’s monitoring/management/eradication program. I term it this way because the program will vary according to the producer’s goals and tolerance for the disease. If you would like more information on what Antel-Bio has to offer, please contact Todd Byrem or Bridgette Voisinnet at 800-631-3510.