

Researchers Team up with Producers in Battle Against Johne's Disease, a \$200 Million Annual Drain on Dairy Industry

When the National Animal Health Monitoring System released its comprehensive report on Johne's disease in 1997, the majority of dairy producers had only a general idea of what the disease was, and fewer still thought it affected their herds. But with an estimated 50 percent of the dairy animals in Michigan infected with Johne's disease, there was no doubt it was a serious industry priority.

Several Michigan State University (MSU) researchers sought out funding to learn more about this economically damaging animal health issue, which has an estimated \$200 million annual impact on the U.S. dairy industry.

Central to the initial research efforts was Dan Grooms, MSU associate professor of large animal clinical sciences and a large animal veterinarian. Along with learning more about the disease, Grooms and his colleagues from MSU and other universities would work for several years to determine the best management practices to employ on a dairy farm to prevent the spread of the disease and lower the percentage of animals infected (prevalence rate).

In 2003, researchers and veterinarians from the MSU Department of Animal Science, College of Veterinary Medicine and the Diagnostic Center for Population and Animal Health, and the Michigan Department of Agriculture joined researchers from 16 other states to monitor dairy herd management practices. The Michigan team was chosen to be a part of the USDA's National Johne's Disease Demonstration Project. The purpose of the national project was to evaluate the long-term feasibility and effectiveness of management-related practices designed to control infection by *Mycobacterium avium paratuberculosis* (MAP), the causative organism for Johne's disease.

Grooms selected seven herds to serve as his Johne's disease demonstration herds. The herds, located in various regions of the state, underwent whole-herd testing to measure baseline levels of infection. From there, a disease risk assessment was conducted, and management practices were put in place to help control on-farm spread of the disease.

"We know that animals are most susceptible to Johne's infection at a very young age, so calf management was our first priority," he says. "There is no cure for Johne's, so the best way to manage the disease is to prevent it."

At the same time that Grooms was assembling his herds for the demonstration project, Galen Schalk, an MMPA member in Hillman, Mich., encountered his herd's first diagnosed case of Johne's disease.

"I had heard about Johne's disease but thought, 'That's not me,'" Schalk says. "We have had a closed

herd since 1974, so because I was not bringing new animals into the herd, I didn't feel we were at risk for the disease."

The first Johne's test from the Schalk's herd, run at the request of his veterinarian, came back positive for Johne's. The diagnosis concerned Schalk, who contemplated how many other cases he might have in the herd, so when Grooms approached him to be part of the Johne's disease demonstration project, Schalk did not hesitate to sign up.

"I had a very minimal understanding of Johne's and minimal prevention practices when we started with this project," Schalk says.

The first round of fecal cultures from the Schalk herd came back with a 21 percent prevalence rate among the 168 animals tested; the second year, 2004, the rate jumped to 42 percent. The more Schalk learned about the disease and the test results on his herd, the more he realized that he had seen cows develop clinical signs of the disease in the past but hadn't realized it was Johne's.

"We would have cows get really thin and drop in productivity, so we would cull them from the herd," Schalk says. "Now I know they were Johne's animals."

Seeing the high prevalence rate, Schalk was eager to eliminate the problem as quickly as possible. Schalk, Grooms and other MSU scientists put together new management strategies to help control the disease.

The area of highest concern on the Schalk farm was the calving area. Cows calved on a manure pack, which created the perfect environment for disease organisms to survive and spread to newborn calves. Though the Schalks had already drawn up building plans for a new transition barn, they opted instead to construct a new maternity and housing area for close-up cows.

"It was good that we were already looking to put up a new building because we really needed a better place for the animals to calve in," Schalk says.

Along with building the new maternity area, Schalk started withholding the colostrum from Johne's-positive cows and feeding newborn calves colostrum from only non-infected cows.

"Johne's can be transmitted to the calf through the colostrum or from the contaminated environment," Grooms says. "Knowing which cows are positive for Johne's is critical in stopping the disease from spreading."

The new maternity area also provided an opportunity for each cow to calve in its own pen and allowed Schalk time to clean and disinfect each pen between calvings. Because animals contract Johne's disease early in life, properly caring for calves is

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.

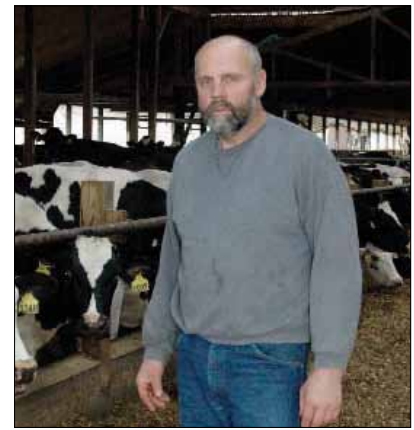
“We saw a reduction in the number of Johne’s-positive animals in all the herds we worked with,” Grooms says. “This project shows us that, though there is no cure for Johne’s disease, with proper management

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.

Quality Watch – *Continued from page 6*

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 Voisinet at 800-631-3510.