



Johne's Watch

The latest information concerning Johne's disease

Vol 1 Issue 8

A Look at Johne's Disease Control Programs

When designing Johne's control programs for individual operations, farm managers and veterinarians need to remain flexible in the options and control measures used on each farm. In 1997, the National Animal Health Monitoring Service (NAHMS) published an extensive study on Johne's disease in U.S. dairy operations. The NAHMS study reported annual losses of \$40 to \$227 for every cow on dairy operations with a moderate incidence of clinical Johne's disease.

While there are some standards in Johne's control, how they are implemented in current management practices will vary. A successful control program must incorporate the individual farm's goals and objectives.

Understanding how Johne's is introduced and spread on the farm is critical to development of a successful control program. If producers can identify the original source of the disease, management practices can be put in place to control any further infections.

The first step in any Johne's control program is testing to determine the prevalence level in the herd, says Todd Byrem manager of technology for AntelBio. Without a baseline score to work from, it is difficult to analyze the program's effectiveness.

Through the development of national and state Johne's control programs, more producers are developing individual farm plans to manage Johne's disease on the farm. Observing the control measures and subsequent results of other farms can help producers implement control plans on their farms.

Case Study: Dairy Operation

Background: This 600-cow dairy operation has undergone considerable expansion in cow numbers in the past couple years. Along with increasing cow numbers, the facilities were also updated including converting freestall barns and building a new double-20 milking parlor. The cows average 85 pounds of milk per animal per day on three times-a-day milking. The cows are separated into eight groups based on age, production level and stage of lactation.

Newborn calves are raised in individual calf hutches separated from the milking herd. Pooled colostrum and waste milk are fed to the calves. At two months of age the calves are transferred to transition pens and fed a TMR until they enter the milking string. The culling rate in this operation has been low to moderate to accommodate the herd expansion.



Goals

Johne's disease was recently found in the herd through fecal culture testing on two cull animals. Since the diagnosis, the owners and their veterinarian have worked to implement a plan to quickly eradicate this disease from the herd. The plan also serves to avoid future occurrences. State certification of Johne's-free status for the marketing of replacement heifers is desired within five to seven years.

Testing Procedures

Conducting a whole-herd test with the AntelBio Milk ELISA was the initial step taken by the owners and the veterinarian in developing a Johne's disease management program. Results from the initial screen

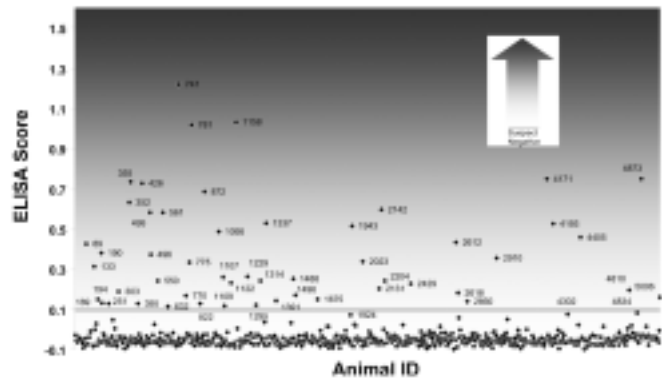


Figure 1. Whole-herd AntelBio Milk ELISA on all lactating animals on Case 1

showed an 8 percent test prevalence of Johne's disease based on a minimal positive threshold of 0.1 for the ELISA score. (Figure 1)

Semi-annual, whole-herd milk ELISAs will be conducted on the herd. Because research has indicated that the risk of transmission increases with increasing ELISA score, each animal is categorized depending on their individual ELISA score. Knowing the individual ELISA score allows the owners to use appropriate management practices with each group.

Along with the test results, an AntelBio Johne's Watch List is prepared and issued to the owner and veterinarian (see figure 2). The management groups indicated on the list are: Red: 0.50 and higher; Yellow: 0.15 to 0.50 and Green: 0.07 to 0.15. The animals are tagged to reflect their grouping for easier management.

The Johne's Watch List offers the veterinarian a wide range of options to assist the herd manager in developing a Johne's control program. This dairy operation has budgeted \$7,200 per year (600 animals x \$6 per test x 2 tests per year) to accommodate their Johne's testing strategy.

Interpretation of Results

On this particular operation the owners and their veterinarian lowered the threshold of the ELISA score to 0.07 to improve the sensitivity of the milk ELISA. Implementing less-aggressive management actions in the low risk group will offset the sacrifice in specificity.

Initial management actions based on the ELISA scores are:

Red Group: Cows with ELISA scores above 0.5 are considered major threats for transmission of *M. paratuberculosis* on this dairy and will be immediately culled. In addition, any of their daughters that are still in the herd will be automatically considered low risk and tagged accordingly.

Yellow Group: Assuming the risk of transmission is higher in animals with higher ELISA scores, another calving area will be used for moderate risk animals, their calves sold and the cows will not be bred back for a subsequent lactation.

Green Group: Considering that animals with ELISA scores between 0.07 and 0.15 generally have a low risk of intrauterine transmission of Johne's to their offspring, the veterinarian has suggested that keeping replacements from these animals is an acceptable practice. However, use of a separate calving area and discarding the dam's colostrum in favor of colostrum from animals three years and older with ELISA scores below 0.07 is advised.

This testing and management scenario will be used until no further reductions in milk ELISA test prevalence are observed over two successive years. Annual whole-herd fecal analysis using the AntelBio Rapid Fecal Test (600 animals x \$20 per test = \$12,000 per year) will follow and fecal positives eliminated until zero test prevalence is achieved for two successive years. Application for state Johne's certification will be evaluated on a continual basis.

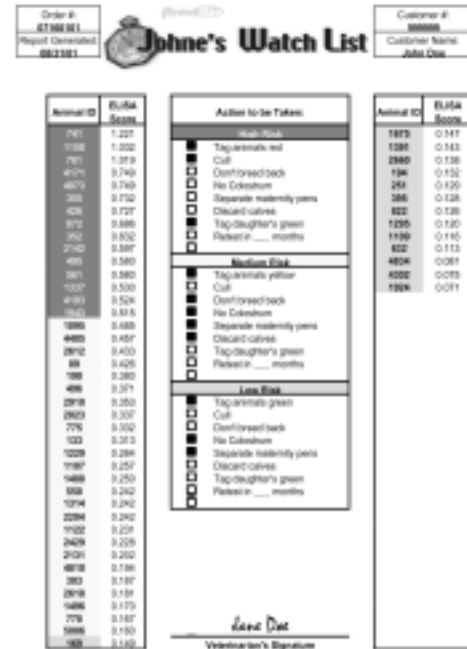


Figure 2. Johne's Watch List for dairy operation Case Study .

Risk Factors and Management Changes

Several risk factors were identified in the animal management practices used by this dairy operation. The following factors were identified as potentially contributing to the Johne's problem in this herd.

¥ **Colostrum Management:** Feeding pooled colostrum and waste milk to replacement heifers was identified as the greatest risk factor for the transmission of Johne's disease. Banked colostrum from ELISA negative cows and milk replacer were adopted as feeding alternatives. Procedures for the pasteurization of waste milk are being considered.



Case Study: Beef Operation

This closed purebred-Angus beef operation began with the purchase of 20 bred heifers in 1978 and has since expanded to 120 cows. The animals are rotationally grazed on improved pastures with a common watering hole. Cows are housed in a large dry lot during the winter months and fed supplemental corn and hay. Bulls are available for natural breeding in the summer. The calves are born in late spring and weaned in September. Heifers and select bull calves are sold as seed stock to commercial cow/calf producers.

Goals

Johne's disease has never been observed in this herd. After noticing the marketing advantage of test-negative animals at recent sales, the owners inquired about testing bulls and heifers for Johne's disease. Explaining that 1) Johne's tests are not meant to be used as individual animal tests, 2) the performance of Johne's tests are poor on young animals and 3) official programs are available for the certification of herd-level Johne's status, AntelBio suggested a consultation with the herd's veterinarian regarding inclusion in the State Voluntary Johne's Program.

The goal of this operation is to achieve and maintain official certification of Johne's-free status. Given the absence of any Johne's diagnosis in the past five years, the herd veterinarian has opted for the fast track to achieve Status Level 2 the first year and Level 4 after the second year.

Testing Procedures

Status Level 2 of the state Johne's control program requires a negative screening test on a statistical subset (all eligible animals for this operation) of second or greater lactation animals. Serological ELISA results of 103 second or greater lactation animals sampled by an accredited veterinarian are presented in Figure 3.

Interpretation of Results

Two animals were indicated on the serum ELISA and fecal samples from these two animals were collected the following week to appeal the initial screening results. Both the AntelBio Rapid Fecal Test and traditional culture were requested on these samples. Results from

the AntelBio Rapid Fecal Test were requested in 72 hours to expedite the removal of these two animals and their calves from the herd in the event they were positive. Traditional culture was requested for official appeal of the initial screening to achieve Status Level 2 after a 16-week waiting period. The AntelBio Rapid Fecal Test did not identify *M. paratuberculosis* in either of the fecal samples taken from the two seropositive animals. Culture results are pending. The total cost for this round of testing was \$739 [(103 animals x \$4.75 per serum ELISA) + (2 animals x \$100 Rapid Fecal Test) + (2 animals x \$25 per traditional culture)].



Figure 3. Serum ELISA results on second or higher lactation animals.

Risk Factors and Management Changes

Although false positives with serum ELISA tests are unlikely, the prevalence level of the herd needs to be taken into consideration when interpreting the results. In this situation the low estimated prevalence based on the initial herd screening, (2 percent test prevalence) warranted a follow-up culture on the test-positive animals. The negative results of the AntelBio Rapid Fecal Test substantiated the herd owner's decision to conduct further testing. The example highlights the value of prevalence estimates from whole-herd tests for the interpretation and use of individual test results

While purebred beef operations lack most of the common risk factors found in dairy operations, such as high animal density, excessive manure buildup, pooling colostrum, and feeding waste milk, significant risk factors specific to beef operations do exist.

¥ **Water Sources:** Ponds used to water the animals are often fed by the runoff from rainwater and are easily contaminated by animals entering the pooled water. Especially in late spring during calving, rainwater can carry *M. paratuberculosis* from contaminated feces into these water sources providing regular, concentrated doses of the organism while drinking. Access to these areas should be restricted in favor of cleaner water sources.

¥ **Cow / Calf Pairs:** The maintenance of cow/calf pairs until weaning significantly increases the probability of transmission from mother to daughter through repeated suckling and proximity. Replacements from suspect dams should be avoided.

¥ **Grazing:** Grazing allows continual access to contaminated feed sources. Avoid manure buildup on pastures to minimize contamination of these feed sources, especially on pastures where calving occurs.

Next Step

¥ Negative results from traditional culture will confirm a negative screening test and this operation will be certified Status Level 2.

¥ Status Level 3 can be achieved with negative fecal culture results on 30 second or higher lactation cows and all bulls two years and older. Both cows indicated on the initial ELISA screen should be included in this sampling. Fecal samples must be collected between 10 and 14 months after the initial herd screen. The cost for this round of testing is \$700 (35 animals x \$20 per traditional fecal culture).

¥ Status Level 4 can be achieved with a negative whole-herd serum ELISA (statistical subset) within 10-14 months of achieving Status Level 3. The cost for this round of testing is \$475 (100 animals x \$4.75 per serum ELISA).

¥ Status Level 4 is maintained with annual negative serum ELISA on 30 second lactation or higher cows. The annual cost to maintain Status Level 4 is \$180 (30 animals x \$6 per serum ELISA).

¥ It is important to review the guidelines dictating entrance and participation in certified voluntary Johne's control programs. Deviation from these guidelines could mean loss of status level.

For more information on developing a Johne's management program tailored to your operation, please call 800.631.3510.



Next Step

¥ Calving Area: Another identified risk factor was the common calving area, which has since been separated into three maternity pens, one for negative cows, one for low risk cows and one for moderate risk cows.

¥ Replacement Animals: The Johne's testing and management system adopted by this operation will require the purchase of replacement heifers to maintain animal numbers. Purchasing should be limited to herds with an established record of zero test prevalence.

Entrance into the state Johne's certification program will be evaluated on an ongoing basis. Once certified as a status herd, they will continue testing according to the certified protocol in order to achieve and maintain the most advanced level (Level 4) in the status program.

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AntelBio
PO Box 23157
Lansing, MI 48909

