

## Managing Johne's with Milk Elisa Testing and a new DRMS Report

Managing Johne's disease is becoming more important to many dairy producers. While Dairy One has provided screening through the use of Johne's milk ELISA tests for several years, we have now collaborated with Dairy Records Management Systems to develop a comprehensive report specifically designed for Johne's. This report will organize Johne's test information, as well as other pertinent data to aid in the management of this disease.

Johne's disease comes from a very slow growing bacteria named *Mycobacterium Paratuberculosis*. The bacteria works by invading the small intestine of very young animals and as it grows, causes a thickening of the intestinal wall. This damage to the intestine impairs normal functioning of the digestive tract and over time nutrient utilization is diminished. The progression involves weight loss, lost milk production, and impaired reproduction. Animals not culled for any of these reasons will eventually die.

The disease, discovered by Heinrich Johne a German bacteriologist and veterinarian, in 1905 can be viewed microscopically after fecal culturing. Fecal culturing remains the gold standard in testing but screening for the disease by milk ELISA testing and observing clinical signs can help manage the disease in a more economical and timely manner. Profuse diarrhea often occurs due to the damage in the small intestine, but of course not all cases of diarrhea point to Johne's infection. However, this symptom unexplained or coupled with some other clinical signs might raise suspicions. Another subtle symptom may be a lump on the lower jaw much like an abscess.

So why worry about a disease that takes so long to develop? Lost milk production is considered the largest economic impact from Johne's disease. The problem is that we can't present un-challenged evidence that Johne's is the cause of lost production and we can't hold it in a bucket to show someone the loss. Never-the-less, Johne's reduces milk production. Premature culling may occur due to reduced production, poor reproduction or even other diseases that take a stronghold once the cow is weakened by Johne's. Often overlooked as an economic loss, is the reduced carcass value or even the un-willingness of buyers to purchase animals for slaughter like the Holstein cow shown here.



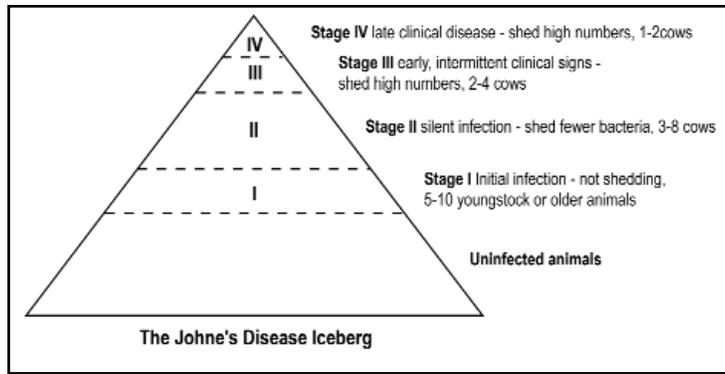
The spread of the disease is primarily confined to the youngstock population of a herd. This fact gives us a fighting chance since we can concentrate the management of the disease at a specific time. For the most part, animals become infected very early, and likely in the first few weeks of life. Spread of the disease happens by young stock ingesting manure, milk, or colostrum from infected and shedding animals. There are known cases of calves being born with the disease and suggests in-utero transmission. The National Johne's Working Group (NJWG) has web resources (<http://www.johnesdisease.org>) that can help us with manure management to reduce chances of that mode of spread. They also address milk feeding management. An important key to managing this disease is the identification of infected animals in the herd. Dairy One and its DHI milk testing services can supply this key component in a Johne's management plan.

Dairy One provides milk ELISA testing in cooperation with the Cornell University Diagnostic Laboratory in New York or Antel-Bio in Michigan. The advantage in using milk ELISA is from both a cost and time standpoint. Milk samples are run for \$6.00 compared to manure cultures at \$30.00 or greater. Results with a milk sample are available in as little as 5 days as compared to 3-4 months on a fecal culture due to the slow growth of the bacteria. Milk ELISA does not measure or count the bacteria directly but measures the antibodies produced by the cow in her effort to fight off this disease. The test is good for a herd screening and indicates herd level prevalence, as well as the very high risk animals that are currently shedding the bacteria. People often do yearly testing as slow growth causes little change from month to month. We can do whole herd or selective testing based on the needs of the dairy. Testing can be the start of a Johne's management plan and should be done with the aid of a veterinarian.

One testing choice can be whole herd. There is a small risk in Milk ELISA testing will produce 1-3% false positives, referred to as specificity. Fecal cultures produce no false positives. This is one reason that some plans include fecal culture or multiple milk ELISA tests before culling. Sensitivity or the ability to detect infected animals is dependent on the stage of infection and is 50% regardless of fecal or milk ELISA testing. In other words we never can be quite sure that an animal does not have the disease but we are more confident she is infected if the test result is positive. Some management plans call for testing of purchased cows as they come into the herd. Older cows are more likely to give better test results since the bacteria has had more time to develop. Testing cows at dry off appears to be popular today because it addresses a few key management points. First, all animals are likely to be at least 3 years of age before they are dried off for the first time and closer to the age where disease detection is more reliable. Secondly, due to less dilution with lower milk production at time of dry off milk ELISA will be more effective in identifying potentially infected animals. Thirdly, if successful we have time to implement a milk feeding management plan before those positive cows calve the next time. Of course some dairies will only test suspicious cows with other clinical signs. We gain little by random testing of cows as results may be disappointing.

Dairy One does not submit bulk tank samples for Johne's testing. Dilution here is not the solution but the enemy with milk ELISA testing. A normal DHI sample may be used for the milk ELISA test and results are normally available within 2-5 days after the sample is sent to the lab. The cost is \$6.00 per sample at Cornell with no cost of transportation but requires the identification of the herd veterinarian. If the herd wished not to involve the veterinarian then samples are sent to Antel Bio in Michigan with shipping costs added to the total. Turn-around time will be greater for this option.

Johne's is not easy to manage. We liken the risk of Johne's in a herd to a ship encountering an iceberg. We can avoid the apparent danger by steering clear of what we see. As with an iceberg the danger is what we cannot see or in the case of Johne's what we cannot know. This picture portrays what we may encounter in the Johne's Iceberg.



Cows in stage one of Johne's infection cannot be detected with milk ELISA or fecal culturing, yet they have the disease. Stage 2 cows are only 10% detected by mil ELISA testing, but in stage 3 10-35% of infected animals can be detected. By the time a cow reaches stage 4, she represents 5 to 20 others in the herd in the hidden part of the iceberg.

The DHI-420 Johne's Report from DRMS helps us organize milk ELISA test information. It includes management data like somatic cell count (SCC), milk production, reproductive status, herd rank, and animals at risk of being infected by their dam. The procedure in receiving this report is a bit different than other reports generated at the records processing centers.

The steps are as follows:

1. Identify cows to be tested and sign up for the report.
  2. Component samples are run and the herd processes and receives normal test day reports.
  3. Samples for milk ELISA Johne's test will be sent to another lab and results are sent to Dairy One as well as the farm.
  4. Dairy One sends results to DRMS and the DHI-420 report will be generated and posted on the DRMS web report site.
  5. The next test day reports will include the DHI-420 mailed to the farm.
- \* Herds needing the DHI-420 report prior to their next test will need to sign up for Web Reports and retrieve it via internet access.

JOHNE'S ANALYSIS											55-99-9999		
DHI-420											HENRY SMITH		
Test Date: 01-26-2010											SMITH DAIRY		
Processed: 01-29-2010													
Index	Barn Name	Sample Date	Corr OD	Result	J Value	Lact	DIM	Cur Milk	Prev Milk	Cur SCC	Prev SCC	# High SCC	305 ME Milk
309	309	11-25-09	1.381	POS	1381	3	6	125			5.7		
733	733	01-26-10	1.374	POS	1374	1	482	51	60	0.5	0.1	1	31382
312	312	07-24-09	.896	POS	896	3	120	71	84	0.2	1.2		20825
67	67	08-27-09	.551	POS	551	1	407	51	60	0.3	0.7		
633	633	08-27-09	.402	POS	402	3	87	79	87	1.1	1.5		19024
10357	10357	09-22-09	.290	POS	290	3	53	145	118	0.1	0.1		27147
586	586	08-27-09	.175	POS	175	3	93	99	81	0.1	0.1		21748
553	553	11-25-09	.150	POS	150	2	301	DRY					26751
173	173	06-25-09	.149	POS	149	3	133	142	126	0.1	0.1		31980
348	348	11-25-09	.126	POS	126	1	478	DRY				2	24935
741	741	11-25-09	.086	SUSP	86	2	20	74		1.1			
559	559	09-22-09	.081	SUSP	81	2	212	62	84	5.3	5.8	3	25405
<b>27 of 28 Cows Tested Negative on Most Recent Johne's Sample Date (01-26-10):</b>													
2	16	30	47	54	57	72	80						
465	502	507	513	580	599	679	717						
2001	2021	2041											

**Grey highlighting** of the "Sample Date" indicates cows tested on the most recent test.

**Recent Kept Calves** lists animals that may be at higher risk due to dam-to-calf transmission.

**Upper section** – shows all active animals that have at least one positive or suspect Johne's result while in this herd.

**Lower section** – lists all active animals that tested negative on the most recent Johne's sample date. A cow, if positive on a prior test, could be listed in both sections.

This report will include all positive tests on cows as long as they remain active in the herd. Other pertinent cow data is also listed for positive cows. The report will be sorted by cow ID or Barn Name.