



Animal Health Diagnostic Center

College of Veterinary Medicine, Cornell University
In Partnership with the NYS Dept of Ag & Markets

US Postal Service Address:
PO Box 5786
Ithaca, NY 14852-5786

Courier Service Address:
Upper Tower Rd
Ithaca, NY 14853

AHDC Fact Sheet

Phone: 607-253-3900
Fax: 607-253-3943
Web: diagcenter.vet.cornell.edu
E-mail: diagcenter@cornell.edu



Johne's Milk ELISA Fact Sheet for Veterinarians

The Animal Health Diagnostic Center (AHDC) at the College of Veterinary Medicine, Cornell University in partnership with the NYS Department of Agriculture and Markets (NYSDAM) is now offering a Johne's ELISA diagnostic test on milk. This test is available to veterinarians directly through the AHDC and through Dairy One for herds providing a veterinarian of record indicated on the submission form.

What sample is needed?

At least 2 mls of an individual cow milk sample, with or without preservative. Colostrum, samples from cows less than 3 days fresh, bulk tank, or composite samples of multiple cows are not acceptable. Any milk samples that are curdled or have visible clots or flakes upon arrival will not be tested. Milk samples should be put into a leak-proof container with a secured top and kept refrigerated until shipped overnight on ice.

What is the cost of this test?

The cost to the veterinarian for samples submitted directly to the AHDC is \$4 per test for NYSCHAP herds and \$5 for non-NYSCHAP herds or out-of-state herds. Samples that are submitted through Dairy One will be billed through Dairy One and the *cost to the producer* will be \$5 for NYSCHAP herds and \$6 for non-NYSCHAP herds or out-of-state herds.

How will results be reported?

For samples submitted directly to the AHDC results will be reported through the normal channel to the veterinarian. For samples submitted through Dairy One the results will be reported to the herd owner, herd veterinarian, and Dairy One. For NYSCHAP herds, the results will also be available on the NYSCHAP database used to access other NYSCHAP-related results.

What is the lag time?

The AHDC will set samples every weekday except Thursdays. Results will normally be available 2-5 business days after the AHDC receives the sample.

What are the details of the test?

The Johne's milk ELISA is a commercial kit licensed to test milk for antibodies against *Mycobacterium avium* subsp. *paratuberculosis* (MAP). As per the kit manufacturer's recommendations, results from the AHDC will be reported out as test POSITIVE or test NEGATIVE with no quantitative qualifier attached.

In what situations might this test be used?

As has always been the case, Johne's disease needs to be approached by first addressing the areas of management that allow susceptible animals to be exposed to an infective dose of MAP. An overall Johne's disease control strategy and herd health plan should be in place for a given herd. For more information on Johne's disease control strategies see: www.nyschap.vet.cornell.edu/module/johnes/johnes.asp. Diagnostic testing is only one piece of the control strategy aimed at identifying animals that are shedding or have the potential to shed MAP at a time when they would expose susceptible animals such as at parturition.

One published study¹ comparing the serum and milk ELISA to fecal cultures concludes that the Johne's milk ELISA may be useful as a herd-level test to estimate herd prevalence on an individual herd among the lactating dairy cattle. The current recommendation of the AHDC and NYSDAM is to consider using this test as a herd-level test rather than an individual cow level test. Published data^{1,2} estimates the

relative sensitivity of this milk ELISA between 21-61% at a cow-level on a population of cows positive on fecal culture. Additional data compiled by the AHDC and NYSDAM on 42 animals on a single herd showed that the milk ELISA wrongly classified 50% (3/6) of the cows that were heavy shedders (at the many level) based on the liquid culture. If a herd were to rely solely on the milk ELISA as a screening test for follow-up fecal cultures or alternative management strategies on individual cows at parturition they would potentially miss heavy shedders. This could have a significant impact on their long term progress toward reducing Johne's disease in their herd.

Can the values for the KELA be compared to the milk ELISA results?

NYSDAM and the AHDC conducted a study on paired milk and serum samples on 967 cows to answer this question. The AHDC Johne's KELA was performed on the serum samples and compared to the results of the Johne's milk ELISA on the milk samples. The analysis of this data set does not support drawing any conclusion about corresponding KELA interpretation categories in ELISA positive milk samples. There were a high number of agreements in the ELISA negative milk samples.

Why is the AHDC reporting the milk ELISA as only positive or negative when others are reporting a quantitative value?

The conclusion of the data analysis for the milk ELISA OD values versus the AHDC Johne's KELA values on 967 paired milk and serum samples was that the interpretation of the milk ELISA should be negative or positive as suggested by the supplier of the milk ELISA test kit.

How do I interpret the test results on an individual cow?

Based on the published data available^{1,2} on this specific ELISA test and the results obtained from follow up fecal samples in the NYSDAM and AHDC serum KELA versus milk ELISA trial, the recommendation is to interpret the results on a herd-level basis rather than an individual cow level basis. A single antibody test on an individual animal needs to be interpreted with caution and in the context of the overall herd situation and should not be the only factor used in management decisions such as culling.

A negative result does not necessarily indicate that the cow is not infected or not shedding as evidenced by the sensitivity range of 21-61% on a population of cows positive on fecal culture. False-positive results are also possible although the milk ELISA is reported to be highly specific. One published study³ reported the specificity of this ELISA to be greater than 99% based on a population of cows from seven paratuberculosis-free herds. It should be noted that ELISA positive cows may or may not be currently shedding MAP organisms in their feces. There is also a suggestion in the literature² that testing may be influenced by stage of lactation and that milk ELISA's may be more accurate early or late in lactation. Confirmation of the shedding status of an individual animal should only be based on a fecal culture or PCR test.

For more information on Johne's disease diagnostic testing strategies please talk with your NYSDAM field veterinarian or contact the AHDC and speak with Dr. Belinda Thompson (607-253-3908) or Dr. Paul Virkler (607-253-3892). Also see: www.diagcenter.vet.cornell.edu/test/feeman/AppendG.pdf. For Johne's disease control strategies see: www.nyschap.vet.cornell.edu/module/johnes/johnes.asp.

References

1. Hendrick SH, Duffield TF, Kelton DF, et al. Evaluation of enzyme-linked immunosorbent assays performed on milk and serum samples for detection of paratuberculosis in lactating dairy cows. *J Am Vet Med Assoc* 2005;226:424-428.
2. Lombard JE, Byrem TM, Wagner BA, McCluskey BJ. Comparison of milk and serum enzyme-linked immunosorbent assays for diagnosis of *Mycobacterium avium* subspecies *paratuberculosis* infection in dairy cattle. *J Vet Diagn Invest* 2006;18:448-458.
3. Collins MT, Wells SJ, Petrini KR, et al. Evaluation of five antibody detection tests for diagnosis of bovine paratuberculosis. *Clin Diagn Lab Immunol* 2005;12:685-692.