

OAHN Bovine Network Project

Disease testing for newly introduced cattle

Veterinarian Information



Project Overview

The purchase of cattle increases the risk of introducing an infectious disease to Ontario dairy and beef herds. By promoting and facilitating disease testing of high-risk cattle, the OAHN bovine network hopes to promote best practices for introduction of new animals into a herd and conduct surveillance for diseases of interest in the cattle population.

The OAHN Bovine project allows veterinarians to submit samples from newly or recently purchased cattle for a panel of tests: *Salmonella* Dublin, *Bovine Leukemia Virus*, *Mycobacterium avium* paratuberculosis (Johnes), and *Anaplasma marginale*.

Criteria to Participate

- Cattle must be > 2 years of age and purchased within the previous 365 days
- A red top and purple top from each animal must be submitted by the attending practitioner
- A completed submission form

A maximum of 10 animals per herd may be submitted to the project.

Testing to Be Conducted

- Anaplasma antibody - competitive ELISA
- Bovine leukemia virus - antibody ELISA
- Mycobacterium avium paratuberculosis – ELISA
- Salmonella Dublin - antibody ELISA

If a positive test result is found for the Anaplasma antibody competitive ELISA, a confirmatory test, *Anaplasma marginale* and *A. centrale* - duplex qPCR will be conducted to rule out a false positive result. This information should help veterinarians and producers make the best decision for the herd as well as more accurately estimate the prevalence of infection in the population of cattle tested.

Test Results

Test results will be received via the AHL results platform, as per other regular submissions.

Salmonella Dublin and Anaplasmosis are included in the list of immediately notifiable diseases under the Animal Health Act in Ontario. As a result, positive test results will be reported to OMAFRA. These diseases are monitored by OMAFRA and the submitting practitioner may receive a follow-up phone call to discuss risk to the herd.

Interpreting Test Results

All test results need to be interpreted in light of the sensitivity and specificity of the test and the history of the animal tested including the herd of origin if that information is available. Some of these tests have limitations for individual use but can inform future decisions such as extending quarantine or choosing to re-test.

Test

Important information for test result interpretation

Anaplasma ELISA

- Sensitivity estimates 95-99% and specificity estimates 90-99%
- False negatives can occur if animal was recently infected and antibodies levels have not yet risen. Can increase confidence in negative results by re-testing approximately 6 weeks later if purchased from an endemic area.
- Animals that recover from anaplasmosis (either naturally or with treatment) typically remain carriers for life and are a risk for infecting other naïve animals
- For the OAHN project, any positive ELISA tests will be confirmed by a PCR test to rule out false positives

BLV ELISA

- An estimated sensitivity (99%) and specificity (99%) indicate the ELISA test is reliable and accurate
- Viral infection is considered life-long and infected cattle have altered immune function associated with reduced production and lifespan while <5% of infected cattle develop lymphoma

Johnes ELISA

- Poor sensitivity (50-55%) for detecting all infected individual animals making false negative results possible
- Specificity is high (99%) but there can be a small number of false positives
- The higher the antibody titre, the more likely the cow is truly positive and the less likely to change test result status
- Antibody titres may fluctuate over time and this can lead to changes in cow test results

Salmonella Dublin ELISA

- In animals >300 days of age sensitivity is estimated to be 50-65%. Repeated negative tests can increase confidence for seronegative herd replacements.
- Specificity of 76-89% but a positive test does not equate to carrier status and may indicate animals exposed to *S. Dublin* who develop transient antibodies that degrade over time
- Carrier animals frequently have persistently high antibody levels over time when retested over a period of several months
- Cross reactions with other *Salmonellae* can occur if recently exposed

References available upon request. To discuss testing or questions about the project, contact Cynthia Miltenburg at cynthia.miltenburg@ontario.ca