Surveillance of Johne's Disease in High Risk Flocks in Northern New York

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Johne's disease is an infection from the bacteria *Mycobacterium avium* subsp. *paratuberculosis* (**MAP**). The infection can result in a thickening of the intestines and secondarily a decrease in absorption of nutrition from food. Infection commonly occurs from oral ingestion of contaminated fecal material (through contaminated pasture, hay or even from manure on skin when nursing) by young animals and can take years before clinical signs are seen. Clinical signs can be difficult to differentiate from other diseases or parasites and includes *weight loss, diarrhea, submandibular edema (bottle jaw), ill thrift, anorexia and even death*. Because sheep flocks commonly utilize pasture for adults and lambs together, it can be difficult to prevent the spread of the infection; compounding the situation is that infected breeding animals can spread the disease, testing can miss positive animals and can be expensive. Johne's can have a hidden financial impact on infected individuals/flocks by decreasing weight at sale, reduced wool income and reduction in live lamb births.

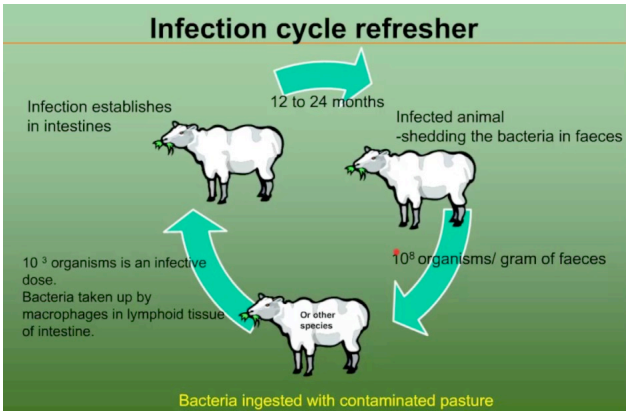


Figure 0: Infection Cycles of MAP

Testing animals can be done through several tests. All testing is considered high specificity (low risk of a false positive) but low sensitivity (high risk of a false negative). An **ELISA test** can be done on blood and screens for the body's immune response to the infection (antibody level). A **PCR test** is looking for the MAP DNA (alive or dead) and the **culture** will grow live, viable organism from the feces which is then confirmed with PCR. The most accurate diagnosis is done at necropsy, so it can be beneficial to have deaths from unknown causes looked at by your vet.

The **goal** of this project was the *gather information* from producers about sheep flocks in the region, *screen flocks* for high risk signs of Johne's disease with survey questions and then perform *surveillance testing* on 20 to 22 flocks. Of the **38 flocks** that responded to the survey, 23 had deaths from unknown causes and 13 reported to have had animals die with signs consistent with Johne's disease. Twenty-one flocks were large enough to be included and interested in participating in the project and represented all 6 counties in the region.

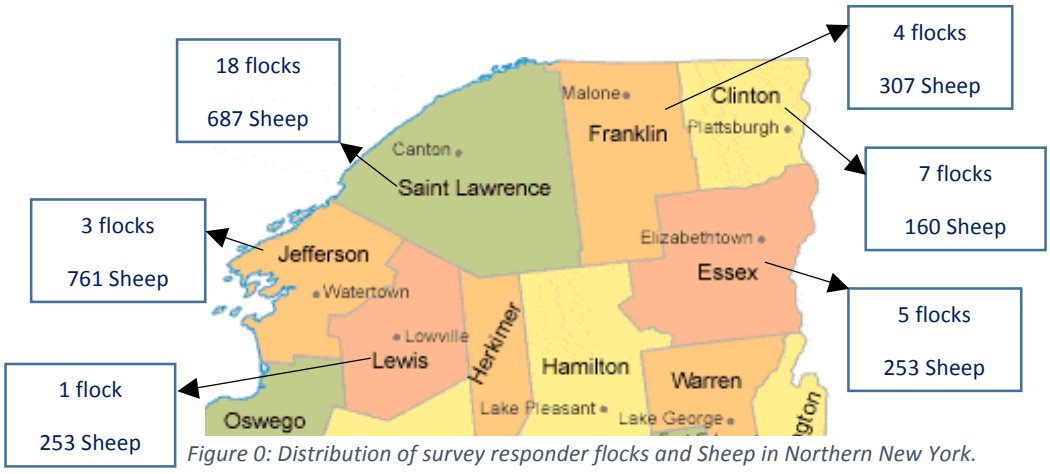


Figure 0: Distribution of survey responder flocks and Sheep in Northern New York.

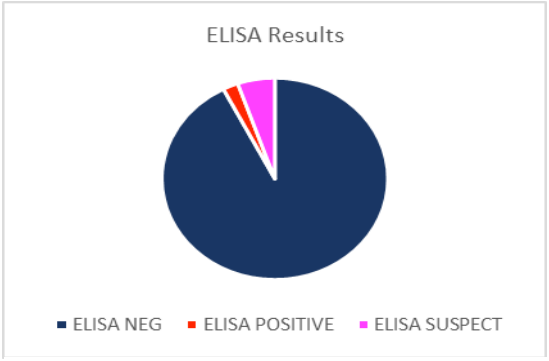


Figure 0: ELISA results for 319 ewes over 2 years of age

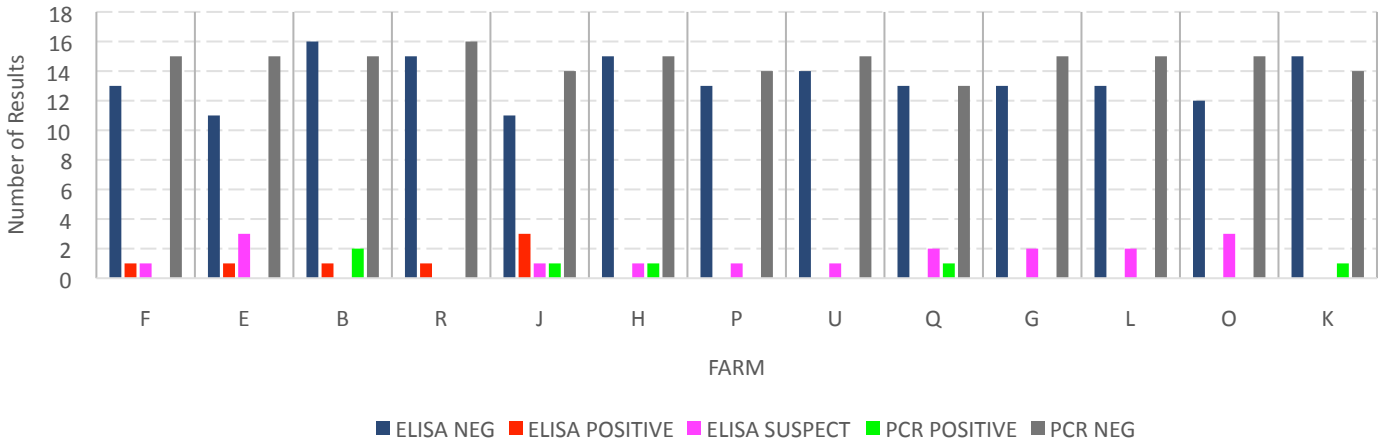
From the flocks included, 15 semi-random ewes over the age of 2 years were tested yielding a sample size of 319 ewes. On the ELISA test, **7 were identified as positive (2.2%)** and *17 ewes were identified as a suspect (5.3%)* with an overall non-negative

rate of 7.5%. This represented 5 flocks with at least 1 positive animal (23%) and 7 flocks with at least 1 suspect (33%), resulting in **57% of flocks with at least 1 non-negative animal**. On the PCR test, **6 ewes were positive (1.9%)** from **5 farms (23%)**; one farm had 2 animals positive. Combining the two tests:

- 13 farms had at least one animal positive (62%)
- 30 ewes had non-negative results on at least one test (9.4%).

At this time, no cultures from the project have been positive for growth (one farm still pending). However, the MAP organism can be difficult to grow in culture depending on the strain of MAP.

Figure 4: Results for farms with at least one non-negative animal by ELISA or PCR



From this project, we can see that:

- Johne's disease is present on some Northern NY flocks, although the level of infection may be low.
- Additional statistical analysis is needed to truly estimate the level of infection in the region and will be done in the near future.
- Flocks can protect themselves from Johne's by only buying animals from herds with known negative Johne's status. If that is not possible, testing animals before bringing them into the flock or quarantining and testing after purchase can help reduce the risk (false negatives means that risk is still there).
- Flocks with known Johne's can limit exposure of lambs to positive adults and make sure food and water are difficult for the animals to contaminate with manure.
- More aggressive approaches may be appropriate for some flocks and can be developed with your flock veterinarian with support from the **NYSSGHAP** program.
- Additional information can be found at: www.johnes.org

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