

Surveillance of Johne's Disease in Goat Herds 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 goat herds commonly utilize pasture for adults and kids together, it can be difficult to prevent the spread of the infection; compounding the situation is that infected breeding animals can spread the disease if sold, testing can miss positive animals, and testing can be expensive. Johne's can have a hidden financial impact on infected herds by decreasing fertility in older animals (Kostoulas et al., 2005) and lowering profit efficiency (Sardaro, et al, 2016).

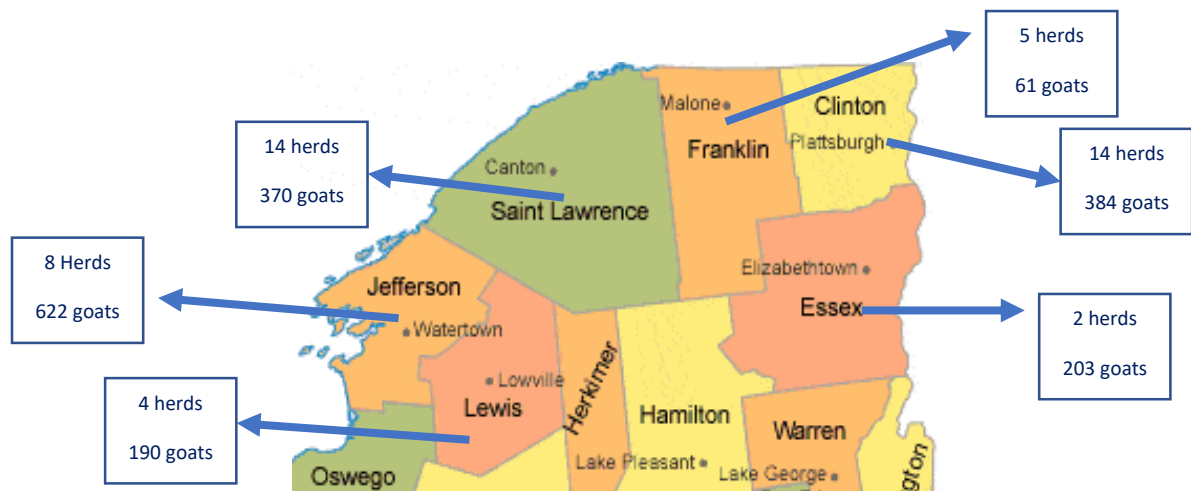


Figure 1: Number of responses to survey by number of herds and how many goats were represented.

Testing animals can be done using three main test methods. All testing is considered high specificity (low risk of a false positive) but lower 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) from feces 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 through both visual observation of the intestinal tract and through microscopic examination of the tissues, 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 goat herds in the region with survey questions and then perform *surveillance testing* on about 330 animals. Of the **47 herds** that responded to the survey, 6 had Johne's confirmed in the herd before, 19 had deaths from unknown causes and 17 reported to have had animals die with signs consistent with Johne's disease. Herds were included if they were willing to participate and either had over 10 animals over the age of 2 or if the investigators were on the farm for another reason. **Twenty eight herds** were included and **318 animals were tested**, representing all 6 North County counties.



From the herds included, all animals over the age of 2 were eligible to be tested, with a maximum of 20 animals tested on each farm. If a farm had more than 20 animals over the age of 2, 20 animals were randomly selected from the eligible population. On the ELISA test, **20 were identified as positive (6%)** from 12 different farms (23%). On the PCR test, **3 animals were positive (1%)** from **3 different farms (11%)**. On the fecal culture, 9 animals were positive (3%) from 6 different farms (21%). Combining the three tests:

- 12 farms had at least one animal positive (43%)
- 28 goats were positive on at least one test (8.8%)
 - 8 farms had more than one animal positive in the herd

From this project, we can see that:

- Johne’s disease is present on some Northern NY goat herds, although the level of infection may be low.
- Johnes disease is present on both sheep and goat farms in Northern NY.
- Additional statistical analysis is needed to truly estimate the prevalence in the region and is currently being worked on.
- Herds can protect themselves from Johne’s disease by 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).
- Herds with known Johne’s can limit exposure of kids to positive adults and make sure food and water are positioned as to reduce contamination with manure.
- More aggressive approaches may be appropriate for some herds and can be developed with your veterinarian with support from the NYSSGHAP program.
- Additional information can be found at: www.johnes.org

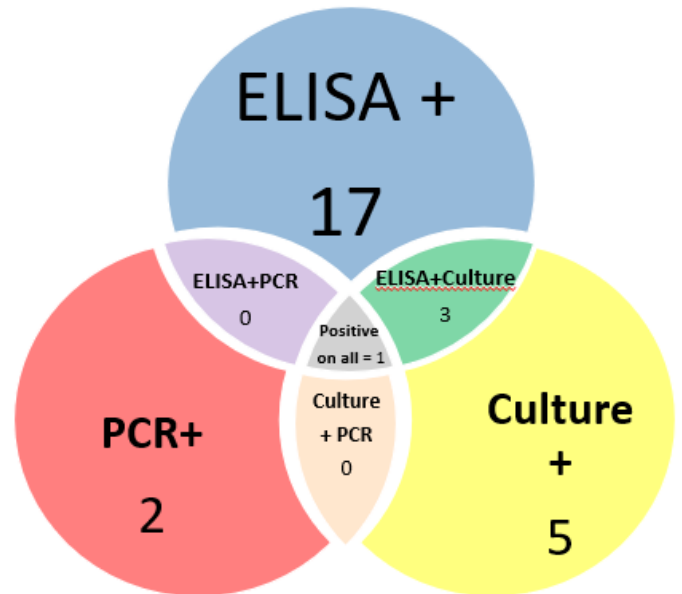


Figure 2: Venn diagram showing number of animals positive on each combination of tests.

Table 1: Comparison of positive results for goats and sheep on an individual animal level and farm level by test

	Individual GOATS Out of 318	GOAT farms Out of 27	Individual SHEEP Out of 316	SHEEP farms Out of 21
ELISA	20 (6%)	12 (44%)	24 (7.5%)	12 (57%)
PCR	3 (1%)	3 (11%)	6 (1.9%)	5 (23.8%)
Culture	9 (3%)	6 (21%)	0 (0%)	0 (0%)
Total	28 (9%)	12 (43%)	30 (9.4%)	13 (62%)



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