



Vermont Cattle Health Improvement Project

Suggested Initial Johne's Testing Strategies

To encourage herds to investigate their status, the VCHIP Project will support \$315.00 worth of testing in each herd. Examples of a combination of tests that a \$315.00 budget will buy are provided. The budget includes up to 2 sample shipments @ \$15.00 each. Producers will have the option to do any amount of testing at their own expense above and beyond the \$315 paid for by the project.

Farms may use any combination of testing that will meet their objectives but suggestions for efficient strategies for common objectives are provided. Obviously more comprehensive strategies will exceed \$315. Choice of a testing strategy should be based **first** on an assessment of what is known about the herd's Johne's history and risk for infection (at least last 5 years): either infection is known to exist in the herd, unknown, or thought to be low or absent. **Second**, the objectives to achieve from the testing should be determined. Objectives vary by herd and may range from a preliminary investigation of whether the infection is present, to establishing a definitive diagnosis in a suspect herd, to initiating a rolling herd testing strategy as part of a herd control plan. Suggested testing strategies that should meet most farm situations are provided based on suspected or known status of the herd:

Table A. Herds with low, no, or unknown status

Table B. Known infected herds.

Combinations of ELISA and Fecal cultures that will fit within a \$315 budget

# of ELISAs	# of Fecal Cultures	# of Submissions
75	0	1
71	1	2
55	2	2
46	3	2
38	4	2
30	5	2
22	6	2
14	7	2
5	8	2
0	9	1

Cost of Testing	
ELISA (KELA)/sample	\$4.00
Fecal Culture (ESP)/sample	\$33.00
Shipping and handling/submission	\$15.00 (up to 2 submissions)

Interpreting the Cornell KELA test:

Multiple cut-offs describe risk

- Four cut-offs define four categories that represent increasing risk that an individual is infected.
KELA ELISA units of: 0-39 = Lowest risk of infection (background activity)
 40-54 = Moderate risk of infection
 55-164 = Moderately high risk of infection
 >164 = High risk of infection

The distribution of KELA values falling within the four categories is summarized for the herd or group. These distributions help assess the probability of infection in the group.

- If a single cut-off was used, a “positive” test would be KELA > 80-90 units. At this cut-off, there is approximately a 2% false positive rate (specificity =98%). Compared to fecal culture testing, there is a 50-70% false negative rate (sensitivity=30-50%).
- If there is no definitive diagnosis of Johne’s in the herd, fecal culture should be done on animals with elevated KELA results above the moderate category.

Distribution of KELA values in groups

- In herds with NO or a very low level of infection (<5%), 3-10% of cows are expected to have KELA > 40.
- In herds with established infection, expect 5-45% of cows to have a KELA > 40.

Sensitivity and Specificity at different cut-offs

The table describes accuracy of the KELA at different cut-off values. The approximate sensitivity (% of infected animals with a value equal or greater to the cut-off value) is relative to the fecal culture test. True sensitivity is actually lower. The approximate specificity (% of non-infected animals with value below or equal to the cut-off value) is based on testing known non-infected herds. Specificity declines as sensitivity increases, in other words the false-positive rate goes up. A specificity above 99% is good. Less than that means that in non-infected herds the chance of false positive results is equal to or greater than the chance of true positive results.

<u>KELA</u>	<u>Approx. Sensitivity %</u>	<u>Approx. Specificity%</u>
40	65	65%
60	55	89%
80	40	98-99%
100	20	99%+