

## Johne's Pooled Fecal Culture Testing Starting Jan. 2005

In an effort to contain the cost of Johne's fecal cultures the NYS Animal Health Diagnostic Laboratory will be offering Johne's pooled fecal culture (JPFC) method starting in Jan., 2005. Based on a pilot study funded by the New York State Department of Agriculture and Markets, pooled fecal cultures, using a pool of five individual fecal samples, appear to be a sensitive and economical means of screening herds and groups of cattle for fecal shedders as part of a Johne's control program.

### Recommended uses and considerations for use of Johne's PFC:

- The JPFC is recommended for screening in lower prevalence herds (with less than 2% clinical cases) or in herds of unknown Johne's infection status with no clinical infection.
- Fecal pooling decreases sensitivity of detection of light shedders (30-40% detection) and is not recommended for herds seeking to manage light shedders.
- When used for herd screening, fecal pooling, using pools of 5, provided only slightly lower herd level sensitivity than is achieved by individual culture screening and provided better sensitivity than ELISA screening with follow-up culture for detection of low prevalence herds.

### Brief Description:

Individual fecal samples should be submitted to the laboratory using standard Johne's fecal culture sampling practices (see Appendix H of test and fee manual). *Please specify Johne's Pooled Fecal culture on the accession form for test requested.* The pooling process will be done in the lab and the individual samples will be cataloged and frozen for re-culture if part of a positive pool. You will not have to re-submit samples. Consequently, results on positive pool samples may take 80 to 84 days due to the re-culture and this must be considered for optimal management of shedding cows.

### Johne's Test Fees:

Fecal pools will be charged the fees listed in the table below. *Individual fecal culture fees will be charged in addition to JPFC fees for individual cultures from positive pools.*

Johne's Test	NYSCHAP Fees <sup>1</sup>	NY not NYSCHAP Fees <sup>2</sup>	Out of state Fees <sup>3</sup>
KELA	3.00	4.00	4.00
Individual fecal culture	7.00	12.00	33.00
<b>Pooled fecal culture</b>	15.00	20.00	33.00

<sup>1</sup>Testing subsidized by NYS Agriculture and Markets for NYSCHAP Herds enrolled in the Johne's Module at the Enhanced or Test Negative Status level.

<sup>2</sup> Testing supported for NYS herds by funding from NYS Department of Agriculture and Markets

<sup>3</sup> Full fee for service testing for out of state herds.

**Questions:** Please call the Johne's Laboratory (607-266-8965) to schedule fecal culture testing or Dr Sue Stehman (607-253-3892) for questions regarding the strategies of use or interpretation of pooled fecal culture results or other Johne's testing strategies.

**Background and additional considerations for use of Johne’s PFC:**

Observations are based on a pilot study in 7 NY dairy herds with individual fecal shedding prevalence ranging from 3% to 30% and on 2 other published studies on pooling five samples for Johne’s culture.

- Sensitivity of detection of moderate shedders is 80-100% and heavy shedders is 95-100% with JPFC (pools of 5) compared to JIFC. Fecal pooling decreases sensitivity of detection of light shedders (30-40% detection).
- In all studies on fecal pooling, ~7 - 8% (~1 in 13) of positive pools did not have positive individual fecal cultures identified on reculture. This finding is thought to be due to the tendency of the organisms to clump and chance detection of low numbers of *M. paratuberculosis* in a pooled sample rather than in the individual samples.

**Cost comparison of IFC to PFC:**

- Across all 7 herds in the pilot study, the average number of pools positive per herd in the pilot study was 20% (range 10% in low prevalence herds to 57% in a high prevalence herd).
- **Cost per animal for testing for Johne’s IFC compared to PFC** - comparisons are based on NY Johne’s Fecal culture costs in a 100 cow dairy enrolled in NYSCHAP JD Module using NYSCHAP subsidized fees of 7.00 for IFC and 15.00 for PFC. (Sampling and shipping costs not included).

	Indiv. Fecal Culture	Pooled Fecal Culture (pool of 5)		
		10% PFC +	20%PFC+	55% PFC+*
# animals	100	100	100	100
# PFC cultures (cost)	-	20 PFC x 15.00 (300.00)	20 PFC x 15.00 (300.00)	20 PFC x 15.00 (300.00)
# IFC cultures (cost)	100 (700.00)	2 PFC+ x 5 IFC = 10 IFC x 7.00 (70.00)	4 PFC+ x 5 IFC =20 IFC x 7.00 (140.00)	11PFC+ x 5 IFC =55 IFC x 7.00 (385.00)
<b>Total Cost</b>	<b>700.00</b>	<b>370.00</b>	<b>440.00</b>	<b>685.00*</b>
Test Cost per animal	7.00	3.70	4.40	6.85

- **\*Pooling is not recommended in higher prevalence herds (>3-5% clinical cases or >10% fecal shedding)** because of cost and increased handling at the laboratory.
- In higher prevalence herds, with good correlation between KELA and fecal shedding, the KELA ELISA screening with fecal culture follow-up appears to be the most economical approach for detection of moderate and heavy shedders.

**Frequently Asked Questions:**

- **Why not use larger pools sizes?** Pools of 10 were tested in the laboratory; however, our pilot study and other studies have shown that pooling 10 animals resulted in lower sensitivity for detection of individual shedders. The larger pools were also more difficult to manage in the laboratory.
- **How do composite samples created on the farm compare to pooled fecal samples?** Fecal pooling is based on representing each cow equally within the pool. Use of a standard protocol with careful weighing and mixing of samples is required to create the pool accurately. The National Johne’s Program has granted provisional recognition to fecal pooling of 5 samples as a herd screening method. When composite samples are created in the field, there is no way of knowing if an adequate sample was provided for each animal, if cow samples were equally represented in the composite by weight, and if mixing was adequate. Mixing and dilution errors can further decrease sensitivity for light and even moderate and occasionally heavy shedders. *Composite sampling is not recognized as a validated sampling technique in the Johne’s program at this time and will not be supported by the laboratory.*