

DAIRY VETERINARY NEWSLETTER

July 2011

Long-Term Study of Johne's Disease Control in Dairy Herds - An Aggressive Test and Culling Program Appears to be Important

Results are coming out from the Michigan Johne's Disease Control Demonstration Project. This was a project on 7 Michigan dairy farms, carried out by Michigan State University together with several other agencies. Each farm was studied for 4 to 7 years, and their Johne's disease/paratuberculosis (JD) control program was evaluated annually. Each herd's prevalence of JD changed differently over time, in association with the fact that each farm practiced control practices differently. *The producers were willing to have their names revealed, which is a great gesture to others in the industry.* A 28-page report can be found at: <http://cvm.msu.edu/alumni-friends/continuing-education/extension/johnes-disease-1/JDSummary%20v3.pdf>

Some of the project goals were:

- To evaluate the effectiveness of JD control strategies
- Develop new knowledge on JD control through field research
- Evaluate different JD testing strategies
- Develop JD education resources

Each herd has some unique and interesting findings. Descriptive statistics such as milk production, SCC, etc. were not usually provided. (Farms milked Holsteins unless otherwise indicated for one Jersey farm.) Each herd's JD prevalence is shown in graphs over time comparing fecal culture for *Mycobacterium avium* subsp. *paratuberculosis* (MAP), the cause of JD, with MAP serum ELISA results. Below are condensed summaries of information from the full report on 6 dairy herds. One herd is omitted because of incomplete results including no fecal culture results for comparison.

Buning Brothers Dairy Farm

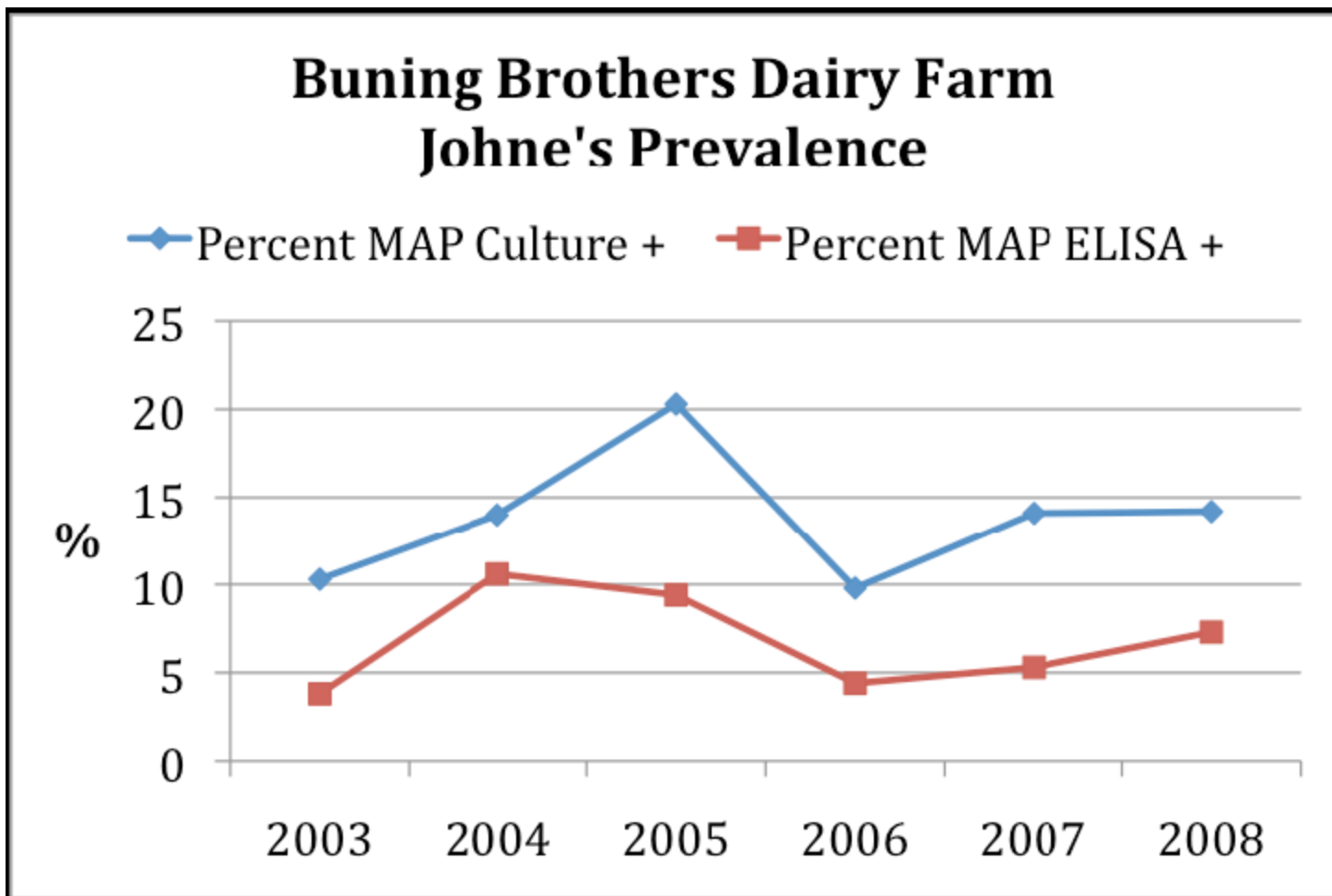
Current lactating herd size: 300 cows. JD was first detected in an 18-mo old home-raised heifer in 2002. Enrollment in study and first whole-herd test were conducted in 2003.

Risk factors for JD identified: Maternity pens shared between JD "clinical and suspect" cows and test-negative cows, pens not cleaned between all calvings. Pooled colostrum, including from cows not yet JD tested, and waste milk fed to all calves. Calving area close to 2 weaned calf pens. MAP was isolated from

maternity and calf pens “several times”. Farm was in expansion mode and did not cull aggressively based on JD status.

Management changes made: No more pooled colostrum or waste milk fed to calves (milk replacer only). “Increasing cleanliness” of calving pens (details or objective scoring of facility cleanliness not provided).

Results through 2008: Apparent JD prevalence on fecal culture increased from approximately 10% to 15%, but came down from the increased level of 2005. The 2 test methods’ prevalence estimates followed parallel lines, and this herd was also unique in that the serum ELISA percentage positive was always lower than the fecal culture percentage positive:



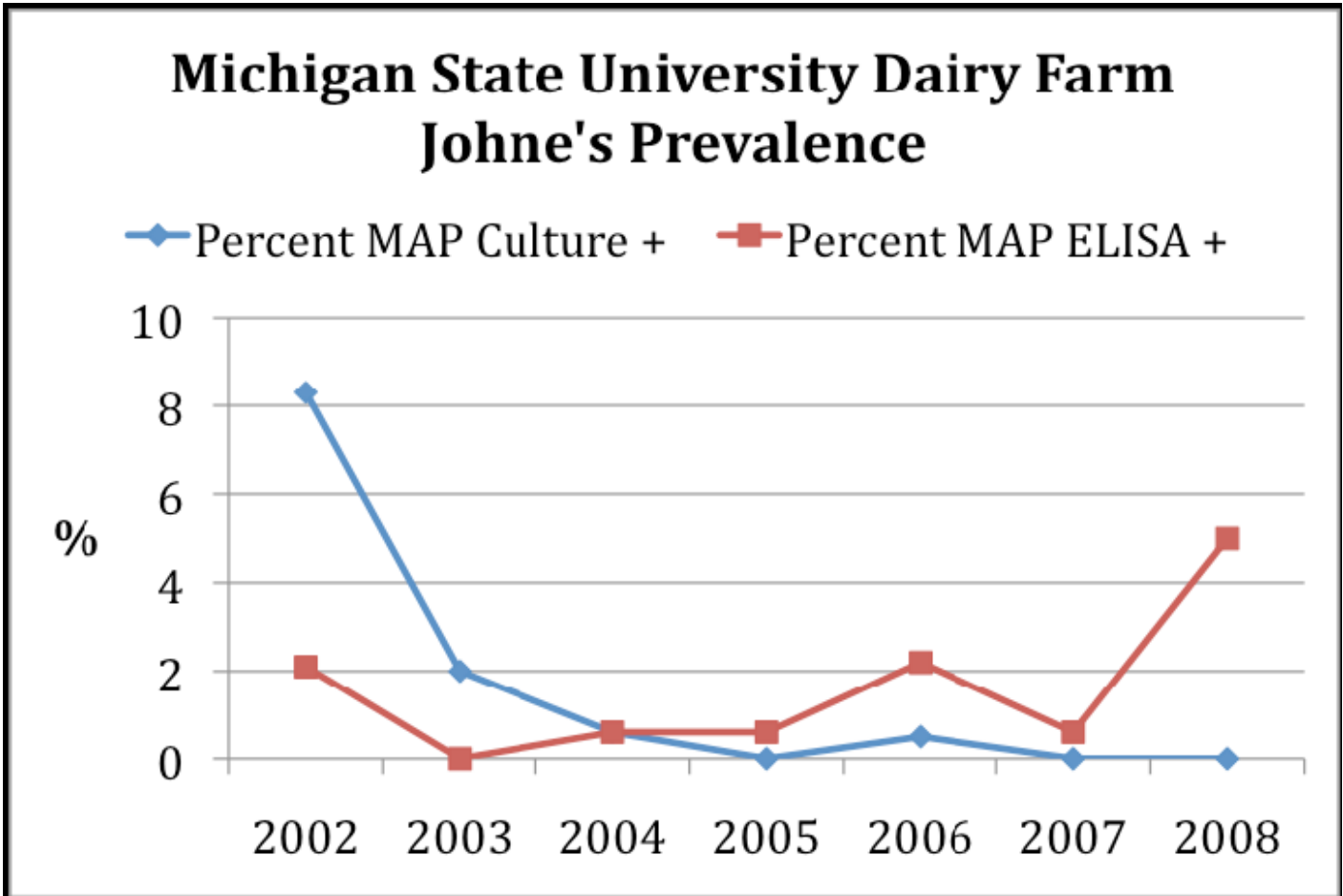
Michigan State University Dairy Farm

Current lactating herd size: 250 cows. Especially interested in control of JD because subclinical cows not known to be infected could “cause erroneous data” for projects measuring milk production as an outcome. Enrollment in study and first whole-herd test were conducted in 2002.

Risk factors for JD identified: “Calving areas” (no details provided). Pooled colostrum, including from cows not yet JD tested, fed to all calves. Vehicles used in feeding the herd drove through manure.

Management changes made: Calf warming boxes adopted so calves could be rapidly removed from dam after birth. Tractors and feed mixer used in feeding no longer driven through manure. Aggressive culling program adopted – all fecal culture-positive cows were culled.

Results through 2008: Apparent JD prevalence on fecal culture dropped to zero. However, the 2 test methods’ lines crossed, and in the last year of the study, 5% of cows were positive according to MAP serum ELISA:



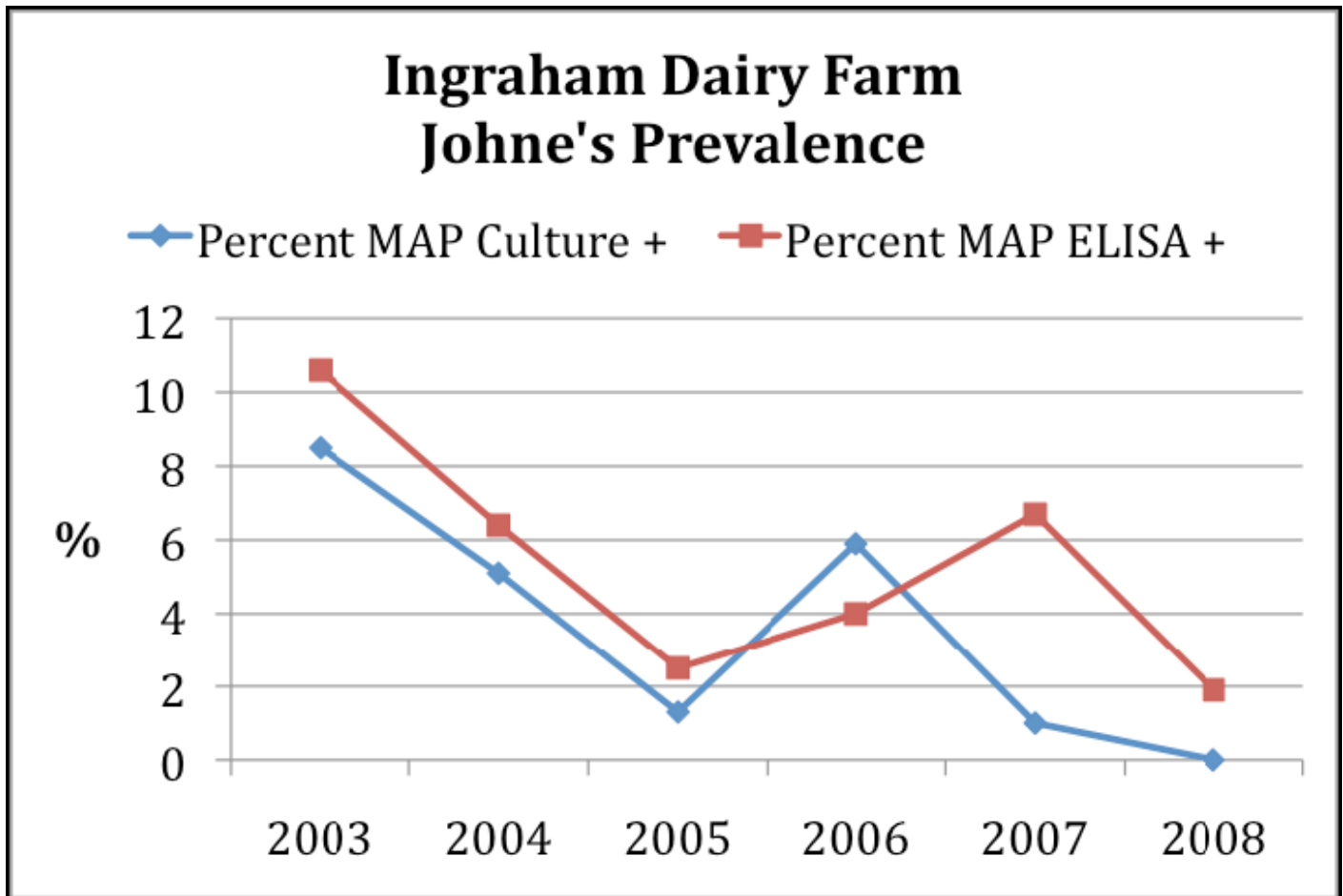
Ingraham Dairy Farm

Current lactating herd size: 100 Jersey cows. Herd had been assembled from multiple sources in 1995. JD was first detected in 2002. Enrollment in study and first whole-herd test were conducted in 2003.

Risk factors for JD identified: Maternity pen overcrowded, sick cows also in pen. Calves often nursed dam for 1 week. Calves fed waste milk, housed in pen adjacent to maternity pen.

Management changes made: “Culled - - heavily - - anything testing [JD] positive was culled.” (Whether this was based on fecal culture results, serum ELISA or both was not described.) Removed calves from dams within 10 hours. Calves fed milk only from JD test-negative cows (apparently this is not true for colostrum, however). (Calves were still housed in pen adjacent to maternity pen.)

Results through 2008: Apparent JD prevalence on fecal culture dropped to zero. The 2 test methods’ lines are similar, and both suggest a marked reduction in prevalence:



Fisk Dairy Farm

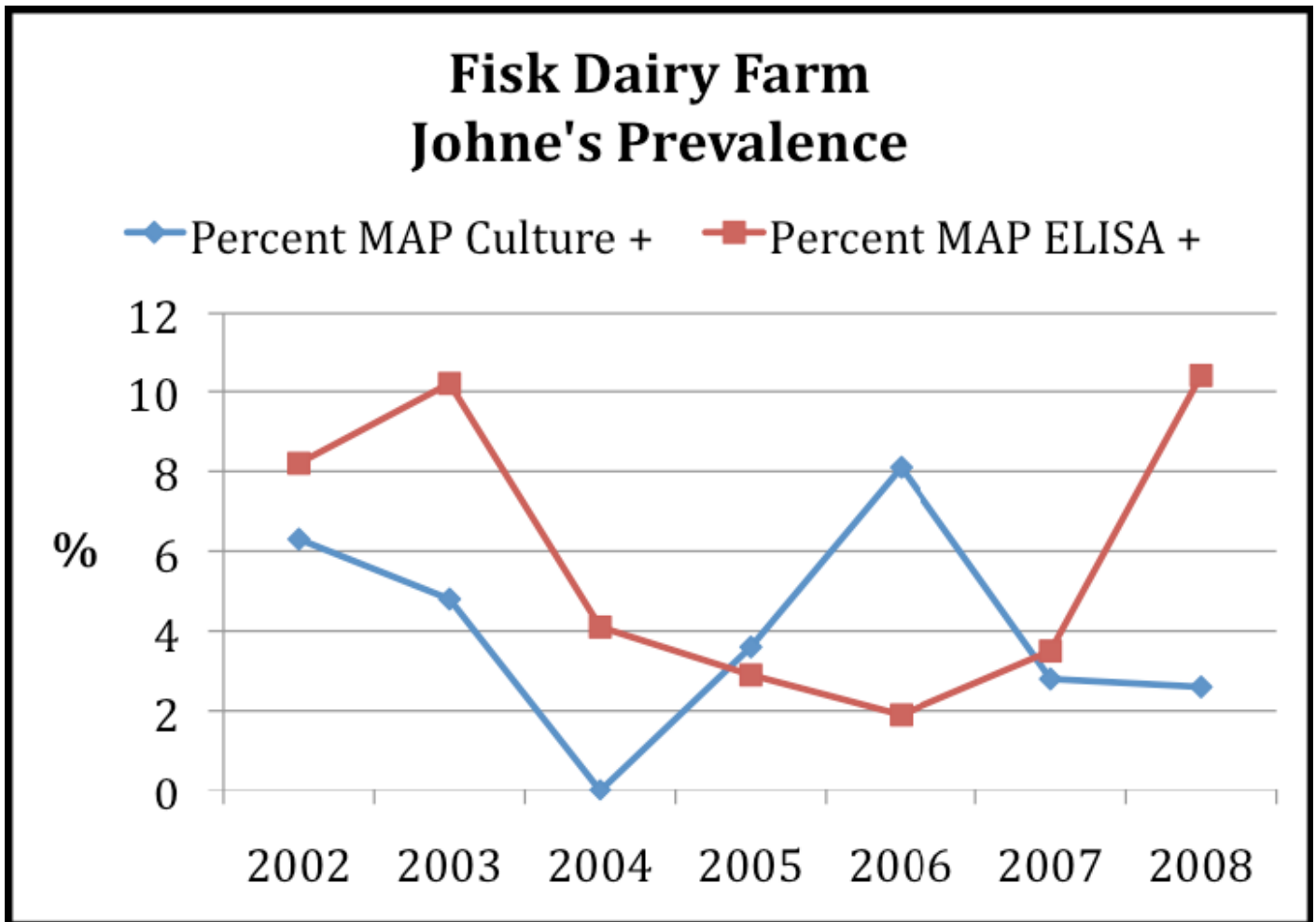
Current lactating herd size: Was 200 cows, then a herd reduction, current numbers not stated. JD was known to be in the herd; how was not discussed in detail. Enrollment in study and first whole-herd test were conducted in 2002.

Risk factors for JD identified: One maternity pen shared between JD test-positive cows and test-negative cows, not cleaned between all calvings. Pooled colostrum and waste milk fed to all calves.

Management changes made: Body condition scores used to detect clinical JD suspects sooner. New management of farm in 2004 - culled all test-positive cows found in 2004. (Whether this was based on fecal

culture results, serum ELISA or both was not described.) Milk replacer instead of whole milk fed to calves (colostrum feeding not described; probably indicates no changes were made).

Results through 2008: Apparent JD prevalence on fecal culture decreased from about 6% to about 2%. Following the heavy culling in 2004, prevalence increased again but then decreased over time. Authors speculated that younger animals calving after 2004 accounted for new JD infections. (Culling practices after 2006 were not explained). The 2 test methods' estimates crossed, with a marked increase in serum ELISA positive cows compared with fecal positive cows only in 2008:



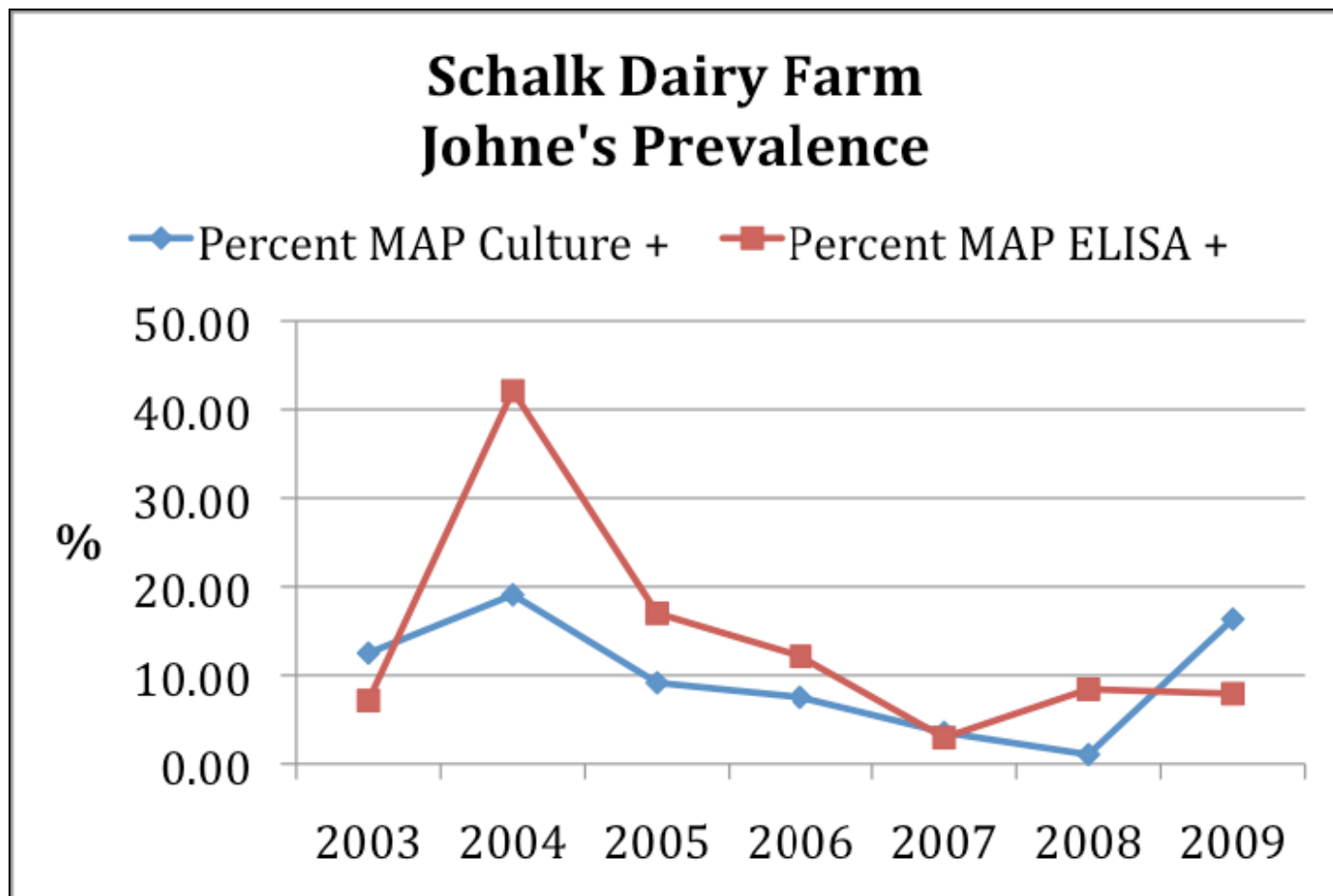
Schalk Dairy Farm

Current lactating herd size: 165 cows. Closed herd since 1974. Owners did not think JD was in herd until they tested for the first time shortly before the study. Enrollment in study and first whole-herd test were conducted in 2003.

Risk factors for JD identified: Maternity area bedded as a manure pack. Whole milk fed to calves.

Management changes made: New maternity area with separate stalls, cleaned out between each calving. (Culling not described in detail, but sounds as though not an intense culling program based on JD results.)

Results through 2009: Note the higher scale on this graph to show higher JD prevalence. Apparent JD prevalence on fecal culture increased from approximately 12% to 17%, having decreased steadily before rebounding during the last year of the project. The 2 test methods' lines are somewhat parallel, but in 2004 the serum ELISA prevalence estimate was 42% and in 2009 it was actually lower than the fecal-based estimate of JD prevalence, showing no change in ELISA positives since 2003:



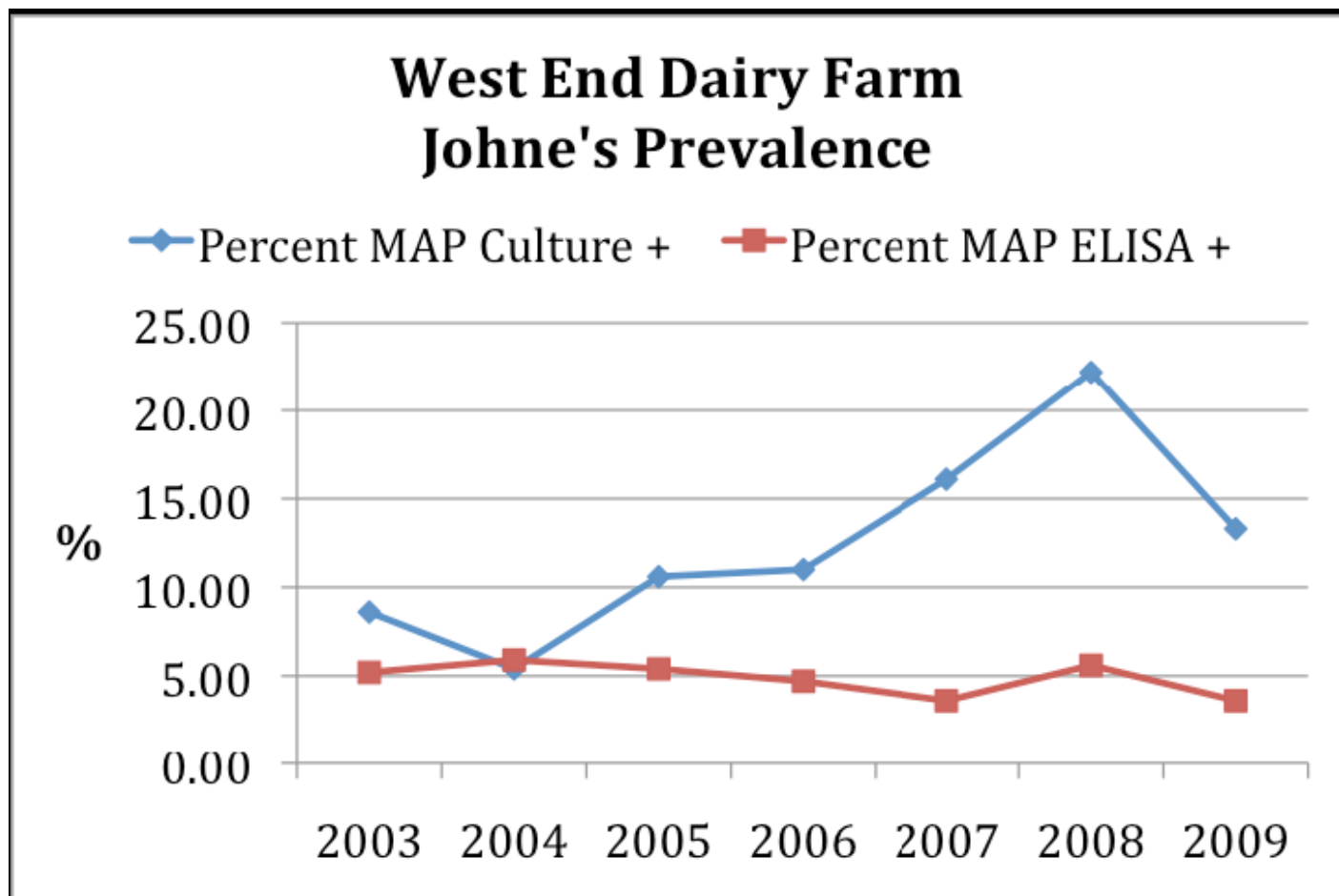
West End Dairy Farm

Current lactating herd size: 500 cows. JD first detected in 1999. Enrollment in study and first whole-herd test were conducted in 2003.

Risk factors for JD identified: Herd expanded from 230 to 500 cows from 2002 to 2009, purchased animals. Other management practices were not discussed.

JD control practices: JD-positive cows ear tagged differently from other cows. JD-positive cows calve in separate maternity area and their colostrum is not fed to calves. Whether these were changes or if so when they were made was not stated. Farm was in expansion mode and did not cull aggressively based on JD status. Owner stated, "We wouldn't cull a cow just based on the Johne's test - - we didn't want to cull an otherwise - - economically viable cow from our herd."

Results through 2009: Apparent JD prevalence on fecal culture increased from approximately 8% to 13%. The serum ELISA prevalence estimate remained steady at approximately 5%, not increasing like the fecal positive percentage did:



Conclusions

Readers should read the entire report, available as indicated above. Some trends that I think are present in these results are:

- No two farms were alike in terms of how JD prevalence changed over 6 or 7 years (not surprising but reemphasizes individual farm variation).
- Relationship within individual cows comparing the two JD test methods was not shown.
- The relationship between MAP culture and MAP ELISA estimates of JD prevalence within the herd varied between all 6 herds.
- It is often said that MAP positive results are more likely with ELISA tests than with fecal cultures on the same group or animals, but in 3 of the 6 herds this was not true.
- 3 farms culled all JD test-positive cows (one did it only at some time periods), and their prevalence estimates of JD, especially based on fecal culture, dropped to zero or near zero.

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- The other 3 farms did not cull aggressively based on JD test results (2 of the 3 farms were expanding during the study), and their prevalence estimates of JD, especially based on fecal culture, increased by at least 40% from the levels at the beginning to the study (10% to 15%; 12% to 17%; 8% to 13%).
- Some calf feeding or management changes, or environmental sanitation changes were adopted on every farm. However, as noted above, aggressive culling of test-positive animals appeared to be a necessary component of reducing or possibly eliminating JD from these dairy herds.
- This study was a long-term commitment by the investigators and the owners and employees on the participating dairy farms, and should be greatly appreciated, including the fact that they allowed their farms' identities to be shown.

Please let us know your comments and also suggestions for future topics. I can be reached at (435) 760-3731 (Cell), (435) 797-1899 M-W, (435) 797-7120 Th-F or David.Wilson@usu.edu.



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