Mycoplasma Mastitis

First reported in England in 1960, Mycoplasma mastitis has since been identified in dairy herds around the world. Mycoplasma organisms are very aggressive—their infections are persistent, difficult to cure, and frequently challenging to detect and diagnose. Because they have no cell walls, they are resistant to antibiotics such as penicillin that interfere with cell wall synthesis.

Some of the characteristics of clinical Mycoplasma mastitis seen in milk samples include:
- abnormal secretions with tan or brownish discoloration, and;
- sandy or flaky sediments in watery or serous fluid where particles usually sink to the bottom of a tube.

Mycoplasma mastitis can affect a cow in any stage of the production cycle, including the dry period, although infections are usually less severe in the dry cow than in the lactating animal. Symptoms include:
- loss of production in the affected quarters, most of which show severe mastitis, but some may simply cease lactating;
- severe purulent mastitis cases that resist treatment in cows that show little or no evidence of illness;
- sensitivity and pain related to severity and acute-ness of the inflammatory reaction;
- an infection that spreads from one quarter to the other quarter on the same side and then to the opposite quarters.

Infections caused by the several Mycoplasma species that can cause mastitis vary in their severity. *Mycoplasma bovis, Mycoplasma californicum,* and *Mycoplasma bovigenitalium* are the most common. *Acholeplasma laidlawii,* which can be found in bulk tank milk, is in the Mycoplasma family, but evidence suggests that it is not by itself pathogenic to cattle. There are other species that cause Mycoplasma mastitis, but much less is known about these.

Detection

The sensitivity of bulk tank culture in detection of Mycoplasma mastitis is dependent on the numbers of organisms shed by infected cows. Research at Washington State University (WSU) has shown that cows may shed inconsistently with possible periods of latency in which there is no detectable shedding. As shown in the graph below, infected cows tested negative 29% of the time—they were not shedding any or enough bacteria to be detected. Another 54% consistently shed more than 1 million cells per ml, permitting easy detection. Seventy percent of the cows had latency periods exceeding 4 days. This variability in shedding patterns makes it very difficult to determine Mycoplasma infection rates through bulk tank milk culturing.

Another pitfall in detecting Mycoplasma in bulk milk samples lies in freezing, storage and thawing methods. Significant reductions in bacteria numbers are found as samples are frozen and thawed or stored for various periods of time.

Somatic cell count (SCC) is the measurement most commonly used as an index of mastitis. In the WSU study, SCC of quarter milk samples from cows infected with Mycoplasma mastitis were elevated and numbers fluctuated little throughout the trial. The correlation between SCC and bacteria numbers (colony forming units) was also highly significant in composite-quarter milk samples, indicating that high SCC can be a result of Mycoplasma infections.

In conclusion, Mycoplasma cannot be reliably detected in bulk milk samples or in samples that have been frozen and stored. Therefore, fresh composite-quarter milk samples from cows with high SCC should be individually cultured to confirm possible Mycoplasma infection.

source: M.K. Biddle and L. Fox, Washington State University