

## ***Mycoplasma* in Bulk Tank Milk on U.S. Dairies**

Mastitis caused by *Mycoplasma* species has a highly variable signs, ranging from mild clinical cases to severe cases in which complete loss of milk production occurs.<sup>1</sup> Even in severe cases of *Mycoplasma* mastitis, affected cows typically remain outwardly normal throughout the course of disease.

The two trademarks of most *Mycoplasma* mastitis infections of individually affected cows are failure to respond to therapy, and spread of the infection from one quarter of the udder to another quarter.<sup>1,2</sup>

The milk of clinical mastitis cows is often watery, tan to brown in color, and often has a flaky or sandy sediment.<sup>3</sup> The affected quarter of the udder is firm and appears swollen, as if the cow had recently freshened.<sup>1</sup>

*Mycoplasma* can be economically devastating to dairies because of the contagious nature of the organism and its resistance to therapy. Early detection and segregation or culling of *Mycoplasma* infected cattle is essential.

Milk transfer during milking is the most common way *Mycoplasma* mastitis is spread from cow to cow.<sup>2,3</sup> Techniques that minimize the spread of milk at milking minimizes the number of new mastitis cases caused by *Mycoplasma*. Although *Mycoplasma* species have been isolated from the respiratory and urogenital tracts of asymptomatic, healthy cattle, under certain circumstances *Mycoplasma* has been associated with pneumonia, ear and eye infections, vaginal infections, and joint disease in cows and calves.<sup>4,5</sup> It has been suggested that spread of *Mycoplasma spp.* from an infected organ system, to the mammary gland, may occur.

Prevalence of dairies with *Mycoplasma* present in bulk tank milk samples ranges from 1 percent to 6 percent in States throughout the United States.<sup>3</sup> However, it is likely that the true occurrence of *Mycoplasma* in bulk tank milk is underestimated, because cows that recover from an initial infection may stop shedding *Mycoplasma* organisms or shed the organisms in such low numbers that they go undetected in bulk tank samples.<sup>6</sup>

In addition, bulk tank samples generally represent only healthy, untreated cattle within a herd, since milk from unhealthy or treated cattle is kept separate. Also, to insure accurate screening of a dairy herd, routine sampling of hospital milk is required.

The National Animal Health Monitoring System (NAHMS) Dairy 2002 study assessed the prevalence of *Mycoplasma* in bulk tank milk. Between February 25, 2002, and June 30, 2002, dairy operations (with at least 30 milk cows) from 21\* States were visited by animal health officials. Timing of bulk tank sample collection from 871 herds ensured that at least 70 percent of lactating cows were represented in each herd's sample.

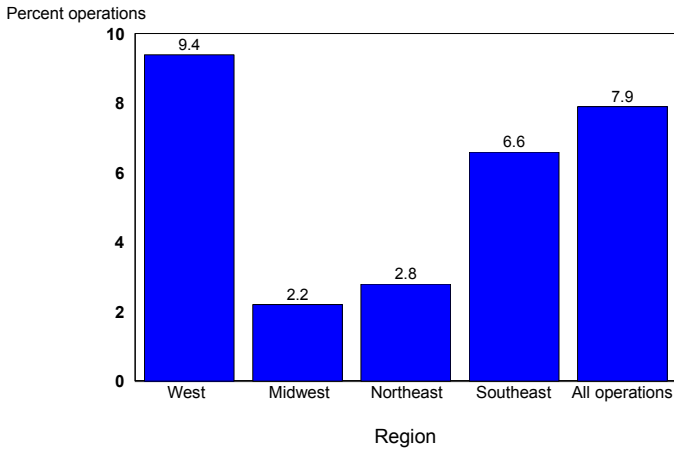
### **Dairy 2002 Study Results**

Dairy 2002 data showed that 7.9 percent of dairies tested positive for *Mycoplasma* when a single bulk tank milk sample was cultured using standard culture methods. The species isolated most frequently was *M. bovis* (86 percent of operations) followed by very small but virtually equal numbers of *M. californicum*, *M. alkalescens*, *M. canadense*, and *M. bovigenitalium*. States in the Western region had a greater percentage of operations with positive *Mycoplasma* cultures than operations in the Midwest, Northeast, and Southeast regions\* (Figure 1). In addition, large herds (500 head or more) were more likely to have positive *Mycoplasma* cultures than medium herds (100 to 499 head) or small herds (less than 100 head) (Figure 2). Sixteen of 21 States (76.2 percent) had at least one operation with a positive *Mycoplasma* bulk tank milk culture.

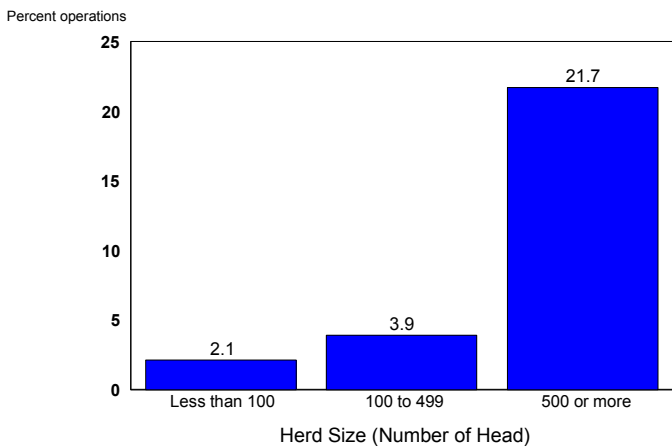
#### **States/Regions\***

**West:** California, Colorado, Idaho, New Mexico, Texas, Washington  
**Midwest:** Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, Wisconsin  
**Northeast:** New York, Pennsylvania, Vermont  
**Southeast:** Florida, Kentucky, Tennessee, Virginia

**Figure 1. Percent of Operations with at Least One Positive *Mycoplasma* Bulk Tank Milk Culture, by Region.**



**Figure 2. Percent of Operations with at Least One Positive *Mycoplasma* Bulk Tank Milk Culture, by Herd Size.**



However, the percentage of operations positive was likely underestimated because herds were sampled only once. Milk from cows with mastitis is not typically put into the bulk tank, and cows with mastitis are the most likely source of *Mycoplasma* within the herd. Individual cows with mastitis were not sampled in this study. Large herds were more likely to be positive, which may reflect herd expansion or the addition of cattle from sources of unknown *Mycoplasma* status.

The most effective method of preventing an outbreak of *Mycoplasma* mastitis is to screen all introduced cattle by collecting composite milk samples at freshening (heifers) or prior to commingling purchased cattle with the home herd. The Dairy 2002 study showed that, before bringing new cattle onto the farm, only 11.0 percent of dairy operations required individual cow milk cultures and just 10.6 percent required bulk tank milk cultures.

Since shedding of *Mycoplasma* is sporadic,<sup>1</sup> screening newly-introduced cattle at one point in time may not detect all infected animals.

In conjunction with culturing individual newly-introduced heifers and cows, bulk tank milk should be cultured at least once a month. In herds with 500 or more cows, a bulk tank culture may not be accurate enough to detect a single infected cow. In this case, culturing a sample from a smaller group of cattle (e.g., an individual pen sample) is recommended on a monthly basis. Herds that are expanding or routinely purchasing springing heifers should consider screening bulk tank and/or pen samples twice a month.

In addition to the screening of purchased cattle and bulk tank or pen sampling, implementing proper milking techniques is critical in minimizing the spread of *Mycoplasma* in the parlor. Proper milking techniques that minimize the spread of *Mycoplasma* and other contagious pathogens (e.g., *Staphylococcus aureus*, *Streptococcus agalactiae*) include: using gloves; minimizing the amount of milk carried between cows on hands and towels; and using 1 percent iodine post-milking teat dip product.

No known therapy cures *Mycoplasma* mastitis or has proven effective in altering the clinical outcome of the infection.<sup>1,3</sup> Approximately 10 to 50 percent of affected cows may return to normal production levels following a dry period,<sup>1</sup> but should be considered infected for life, since intermittent shedding is common.<sup>2</sup> Pasteurizing hospital milk should be considered in herds with a culture positive bulk tank to prevent the spread of disease from cows to calves.<sup>7</sup>

<sup>1</sup> Bushnell RB. *Mycoplasma* mastitis. *Veterinary Clinics of North America*. 1984; 6:301-312.

<sup>2</sup> Jasper DE. *Mycoplasma* and *Mycoplasma* mastitis. *JAVMA* 1977; 170:1167-1172.

<sup>3</sup> Kirk JH and LH Lauerman. *Mycoplasma* mastitis in dairy cows. *Compendium*. 1994; 16:541-551.

<sup>4</sup> Bennett RH and DE Jasper. *M. alkalescens*-induced arthritis in dairy calves. *JAVMA* 1978; 172:484-488.

<sup>5</sup> Gourlay RN. Significance of *Mycoplasma* infections in cattle. *JAVMA* 1973;905-909.

<sup>6</sup> Guterbock WM and PE Blackmer. Veterinary interpretation of bulk tank milk. *Veterinary Clinics of North America*. 1984. 6:257-268.

<sup>7</sup> Butler JA, et al. Pasteurization of discard *Mycoplasma* mastitic milk used to feed calves: thermal effects on various *Mycoplasma*. *J Dairy Sci*. 2000; 83:2285-2288.

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For more information, contact:  
USDA:APHIS:VS:CEAH  
NRRC Building B., M.S. 2E7  
2150 Centre Avenue  
Fort Collins, CO 80526-8117  
970.494.7000  
E-mail: [NAHMSweb@aphis.usda.gov](mailto:NAHMSweb@aphis.usda.gov)  
[www.aphis.usda.gov/vs/ceah/cahm](http://www.aphis.usda.gov/vs/ceah/cahm)

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