



Cooperative Extension Service
Institute of Food and Agricultural Sciences

Mycoplasma Mastitis¹

Jan K. Shearer and R.K. Braur²

Mastitis in cows caused by *Mycoplasma* sp. is characterized by rapid onset, involvement of all four quarters, marked drop in milk production, abnormal appearing milk secretions that may be tannish, watery or flaky, and severe inflammation of the udder with relatively mild signs of systemic illness. Isolation of the organism from milk samples requires special laboratory methods and as yet there is no satisfactory treatment or vaccine available.

Mycoplasma mastitis was first reported from England in 1960 and has been recognized in the United States since 1961. Since that time it has been reported from much of Europe, Canada, Japan, Israel, Australia and New Zealand. In the United States the first recognized outbreak occurred in Connecticut followed shortly thereafter by an outbreak involving several herds in New York. Although much of the attention in past years has been focused on California it was not until 1964 that an outbreak occurring in that state was described. It is quite likely that mastitis caused by mycoplasma existed for some time prior to its discovery, however, these early findings spawned the formation of an active mycoplasma mastitis research group in California that has added much to our current understanding of this disease.

Mycoplasma are unique organisms. They do not fit the description of a bacterium or a virus and are classified as microbes intermediate between the two.

Mycoplasma do not have cell-walls. This anatomical feature makes them *unsusceptible* to certain antibiotics such as penicillin which specifically act by interfering with cell-wall formation. *Mycoplasma* differ from viruses in that mycoplasma are larger than viruses and damage tissue cells by different means. Viruses produce disease by incorporating themselves into the complex machinery of the interior of the animal's cells. Inside the cell they utilize the cellular machinery to produce more virus while remaining partially protected from the action of therapeutic agents and the body's defense mechanisms. *Mycoplasmas*, like most bacteria, do not enter the animal's tissue cells but instead attach to the surface of cells and destroy them by means which are not totally understood.

Unfortunately, too little is known about the factors which influence the frequency and distribution of this form of mastitis in dairy herds. Studies indicate that the organism is susceptible to drying and is destroyed by most disinfectants and teat dips. On the other hand, the organism will persist in unsanitary, warm, moist environments which provide the ideal conditions for its survival. There is also evidence that the organisms can inhabit the upper respiratory tract and vagina of cows. In addition, a further interesting observation is the occasional detection of mycoplasma and the virus of IBR in milk obtained from infected cows.

1. This document is VM-38, one of a series of the College of Veterinarian Medicine, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Date revised: March 1983. Please visit the FAIRS Website at <http://hammock.ifas.ufl.edu>.
2. Jan K. Shearer, D.V.M., M.S., Extension Veterinarian, college of Veterinarian Medicine, and R.K. Braun, D.V.M. professor, Department of Preventative Medicine, College of Veterinarian Medicine, Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, 32611.

The Institute of Food and Agricultural Sciences is an equal opportunity/affirmative action employer authorized to provide research, educational information and other services only to individuals and institutions that function without regard to race, color, sex, age, handicap, or national origin. For information on obtaining other extension publications, contact your county Cooperative Extension Service office. Florida Cooperative Extension Service / Institute of Food and Agricultural Sciences / University of Florida / Christine Taylor Waddill, Dean

The immune responses of cows infected with *Mycoplasma bovis* are depressed. Mycoplasmas not only survive the presence of large numbers of leukocytes present in milk which are produced in response to the infection, but seem to thrive and prosper. Much needs to be learned about the cow's defense mechanisms and how they are influenced in this disease but the suppression of immune responses is a very important reason for the difficulty in control of this form of mastitis.

Outbreaks of this disease- are commonly traced to the purchase and introduction of infected cows. Dairy cows involved in livestock shows where they may have been exposed pose another potential threat.

The most important environmental factors relate to sanitation in regards to milking practices and milking machine function. Cow-to-cow transmission may occur via the milker's hands, the use of sponges or multiple use cloths for udder preparation, use of ineffective teat dips or the improper application of teat dip and by inadequate sanitary measures employed when treating cows, to name a few. Careful attachment and detachment of milking units resulting in a minimum of vacuum disturbance, control of liner slippage and routine maintenance of milking machine equipment components are essential features of proper milking technique and machine function and demand a conscious effort in mastitis control.

Mycoplasma mastitis should be suspected whenever the following are present:

- 1) An increase in mastitis cases that resist treatment.
- 2) Mastitis cases that typically spread from one quarter to another such that often all quarters become involved.
- 3) Mastitis which results in marked loss of milk production from affected quarters, some of which will show severe mastitis, and some of which may show a milder form of mastitis but continue to dry up.
- 4) Mastitis cases which result in milk secretions which are tannish or brownish ultimately becoming watery and laden with pus and flaky debris.

Herds which are not affected with mycoplasma should monitor their herds routinely through culture of bulk milk. This should be done at least monthly and possibly more often in some herds. Maintain a closed herd if possible, however, if it is necessary to purchase cows, attempt to determine if the herd from which cows are being purchased is a culture-negative herd. Ask for a bulk tank culture report or have the cows being purchased determined culture-negative before bringing them into your herd. If and when such information is available review somatic cell count data from the herd milk quality reports, Milk Cooperative reports, or DHIA-SCC program summaries and individual cow records. Don't buy a "Mycoplasma Mastitis" problem.

Control measures to be adopted when a herd is diagnosed with mycoplasma mastitis have been suggested and include the following:

- Culture all cows for mycoplasma. This is done on composite samples (one sample includes milk from all four quarters). Sometimes sampling can be confined to certain strings or groups known to contain infected cows. Appropriate samples of tank milk may help to classify strings as infected or not infected.

A. Dairymen milking cows in a parlor can sample all cows on a single side (up to 20 cows) into one composite sample vial. Cows milked in a flat barn can be assigned similarly. Each cow must be identified and her number recorded as being assigned to a particular sample vial. If a composite sample is found to be culture-positive for *Mycoplasma*, each cow assigned to this sample group must be individually cultured to identify the infected cows.

Sanitation is extremely important when obtaining milk samples for culture. The cow's udder, feet and lower legs must be clean. The udder and teats should be dry and teats should be disinfected with a new alcohol pledget immediately prior to sampling.

- Remove all cows with positive mycoplasma milk cultures from the main milking strings of the herd. The following alternatives may be considered:

A. Market infected cows for slaughter. This is the recommendation of choice for most severe clinical infections. Treatment has not been very effective.

B. Segregate infected cows when large numbers of cows are subclinically infected in a herd, they may be maintained as an entirely segregated group of cows on the dairy. They should always be milked last, and cows entering this group should *not* re-enter the mycoplasma-free herd.

C. Dry off infected cows and place them in a separate dry cow herd. Resample at least two times after freshening and remove cows positive at that time.

- Monitor the herd by sampling the tank milk after each string is milked once each week until negative cultures have been obtained two times from all samples. Collect cow samples from all strings associated with positive tank samples. Remove all positive cows from the milking strings and handle as in 2 above.

Examples: (Six strings are milked)

- a) All six tank samples are positive. Sample entire herd.
 - b) Samples 1, 2, and 3 are negative; 4, 5, and 6 are positive. Sample cows in strings 4, 5, and 6.
 - c) Samples 1, 2, 3, 4, and 5 are negative; 6 is positive. Sample cows in string 6.
- Continue weekly samples on total tank milk until four consecutive samplings are negative. Then collect and test on a monthly basis for several months.

- Test each clinical mastitis quarter for mycoplasma until the herd is free of mycoplasma. Do not return cow to main strings unless test is negative for mycoplasma. Remove positive cows as in point 2.
- Test each fresh cow before admission to milking string. Remove positive cows (point 2).
- Keep mastitic cows separate from fresh cows at all times.
- Always milk any known mycoplasma cows last or in a separate milking set-up. Milkers should never milk clean cows after milking infected cows without changing clothes and disinfecting hands.
- Teat dipping with an effective teat dip should be rigorously followed.
- Where possible, disinfect teat cup clusters in a clean disinfectant solution after milking cows suspected of having mycoplasma infection.
- Always test purchased cows for mycoplasma prior to admission to regular herd. Several outbreaks have followed purchase of herd additions.