

**Mastitis Control Program**  
**for**  
**Mycoplasma Mastitis**  
**in Dairy Cows**

by

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## **Introduction**

Mycoplasma are the simplest form of self-replicating organisms. They lack the typical bacterial cell wall and attach directly to the host cell to obtain essential nutrients.

Mycoplasma species are capable of causing mastitis, arthritis, reproductive disease, ear infections and respiratory disease in dairy cattle. With respect to dairy cattle mastitis, mycoplasma are highly contagious and can be an economically important cause of milk loss and increased culling of infected cows. Mycoplasma mastitis has been reported in most geographical locations that contain intensive dairy production. The prevalence of mycoplasma in routinely tested bulk tank milk on dairies is usually less than 5%.

However, shedding patterns, minimum level of detection and dilution by herd milk in large dairy herds, influence the true detectable prevalence.

## **What species of mycoplasma are known to cause mastitis?**

Mycoplasma species commonly known to cause mastitis in dairy cows are *Mycoplasma bovis* (*M. bovis*), *M. bovis genitalium*, *M. californicum*, *M. canadense* and *M. alkalenscens* plus other mycoplasmas. Of these *M. bovis* is by far the most important cause of mycoplasma mastitis in dairy cattle. *Acholeplasma laidlawii* is also found in bulk tank milk particularly associated with rainy, wet weather conditions but it is generally considered not to be a cause of mastitis.

## **Where can mycoplasma be found on a dairy?**

Cows chronically infected with mycoplasma are the single most important reservoir of mycoplasma on dairies. Isolation of mycoplasma is restricted to animal samples such as

milk, joint fluids, reproductive tract discharges, and swabs from ears and the respiratory tract. There is some indication that mycoplasma may invade the blood stream to cause mastitis, however, this not a significant route of transfer. Mycoplasma have also been isolated from environmental locations and are known to survive for long periods in manure. The significance of these environmental reservoirs of mycoplasma is not currently understood with respect to mastitis.

### **How do mycoplasma organisms move from infected cow to a non-infected cow?**

Most mycoplasma infections can be traced to newly arrived heifers or cows on the dairy. Once placed in the milking herd, the highly contagious mycoplasma readily transfer from infected cows to non-infected cows during the milking process on the milking equipment, common towels used for washing or drying udders and milkers' hands. Mycoplasma enter the mammary gland through the teat opening prior to infecting secretory tissues. Mycoplasma is very contagious and readily spreads from one quarter to another quarter in the same cow during the milking process. Cows in any stage of lactation – dry or milking – can become infected.

Transfer is also felt to occur in cows with metritis due to uterine discharges flowing down from the vulva onto the udder and teats. Some outbreaks of mastitis have been associated with respiratory disease or arthritis in calves or cows on the dairy. In many cases of mycoplasma mastitis, the precise source and mode of transfer cannot be determined.

Some herd outbreaks of mycoplasma mastitis have been traced to transfer of mycoplasma from large volume bottles of antibiotic solutions that have become contaminated by multiple entry with infusion cannulas. The infusion equipment and containers become contaminated by repeated intramammary infusion of infected cows.

### **What kind of mastitis does mycoplasma cause?**

Mycoplasma causes both non-clinical and clinical forms of mastitis. The classical signs of mastitis due to mycoplasma in a herd are:

- Increased incidence of cases that are resistant to therapy
- Clinical cases that involve multiple quarters at the same time
- Systemic clinical signs such as fever and off feed
- Rapid decline in milk production
- Abnormal milk that is often brown to tan with a flaky sediment in watery or serous fluid. Some milk samples when allowed to settle may appear to have a sandy, granular appearance.
- Non-clinical mastitis cases are characterized by elevated somatic cell counts with normal appearing milk. In either case, these observations are not unique to mycoplasma alone.
- In some instances, the mycoplasma outbreak may be temporally associated with increased cases of arthritis or pneumonia or both.

### **What are the possible ways to treat a mycoplasma-infected cow?**

Currently there are no known effective antibiotic treatments for mycoplasma mastitis.

## **What herd effects does mycoplasma have?**

In dairy herds without preventive and surveillance programs, up to 70% of cows have been reported to be infected with mycoplasma.. When this occurs, the economic impact on the herd is tremendous. Outbreaks of this magnitude are most often associated with non-hygienic infusion techniques or using contaminated intramammary infusion products. In herds with surveillance programs, the prevalence seldom reaches 10% and the economic impact is usually mild.

Mycoplasma mastitis results in many and varied effects. These may include any of the following:

- Production loss due to damaged quarters,
- Infected quarters that fail to produce milk,
- Prolonged milking times,
- Increased treatment costs without success,
- Increased amounts of discarded milk following treatment
- Decreased milk quality due to elevated somatic cell counts. Note that individual cow SCC will rise quickly following infection.
- Increased culling
- Increased risk of antibiotic residues in bulk tank milk.

Many mycoplasma-infected cows continue to produce milk at a normal rate. This milk is not of public health concern, however, it will be of low quality due to the persistently high somatic cell counts. Many dairymen prefer to keep mycoplasma-infected cows

when they have developed a plan to prevent the spread of infections to non-infected cows. Mycoplasma- infected cows can be culled when milk production decreases below an economic breakeven point.

### **What are some indications that mycoplasma is in my dairy herd?**

- Presence of mycoplasma in the bulk tank milk. This often occurs prior to any significant rise in the bulk tank SCC.
- Increased bulk tank somatic cell counts similar to other major mastitis pathogens. However, in large herds, many cows may become infected with mycoplasma before it is noted in the herd SCC.
- An increase in clinical cases of mastitis that are resistant to usual treatment practices including dry cow therapy.
- Isolation of mycoplasma in milk from cows with clinical mastitis cases.

### **Does mycoplasma show up when normal milk culture methods are used?**

Isolation of mycoplasma from milk samples requires specially modified culture media. The modification is necessary to restrict growth of bacteria that grow faster than mycoplasma. Culture plates must be incubated for 4 to 7 days as mycoplasma grow very slowly. Additional steps and time are required to identify actual species of mycoplasma. Speciation is necessary as some mycoplasma that are found in milk are not pathogenic such as *Acholeplasma laidlawii*.

As with any isolation procedure, there is a minimum level of detection. Dilution of mycoplasma milk from infected cows can occur in bulk tank milk.. However, it has been reported that normal mycoplasma culture methods can detect a single infected cow in bulk tank milk from a herd of several hundred milking cows. In some cases, infected cows are marketed from the herd before results of the bulk tank milk cultures are completed. Subsequently, isolation attempts will result in no more mycoplasma isolations. Furthermore, infected cows shed mycoplasma intermittently and can sometime be missed on culture.

Freezing individual cow milk samples will not affect the ability of culture methods to isolate mycoplasma.

### **What should I do if mycoplasma is found in my dairy herd?**

As with any infectious mastitis pathogen, the initial step should be to estimate the prevalence of infection within the herd by culture. Random cow or high SCC cow milk samples may be used. Once prevalence has been estimated, the economic impact of mycoplasma infections can be established. Dairymen must do a risk assessment for their herd before deciding on the management strategies to deal with a mycoplasma mastitis problem.

In **low economic impact situations** such as finding an infected fresh cow or isolating mycoplasma from the bulk tank without any increase in SCC, control actions may be limited to:

- Culling a few infected cows with high somatic cell counts
- Culling a few infected cows that are non-responsive to treatment efforts
- Beginning a mycoplasma prevention and surveillance program
- Evaluation of the milking technique
- Monitoring bulk tank milk for mycoplasma on a monthly or more frequent basis.
- Monitoring the somatic cell count of individual cows on a monthly or more frequent basis.
- Culturing all clinical mastitis cases as they occur. Samples may be frozen for later analysis.
- Culturing all herd additions before arrival or shortly after arrival. Newly arrived or purchased animals should be segregated and milked last until the culture results are known. A SCC less than 200,000 and two negative cultures should mark those cows as mycoplasma-free.
- Culturing all fresh heifers and cows within 2-3 days after calving.
- Culturing cows with SCC over 200,000 or DHI linear score greater than 4.0.

In **high economic impact situations** such as herd outbreaks with many milking cows infected along with elevated bulk tank SCC, control actions may include:

- Culture of the entire herd in an attempt to identify all infected cows.
- Segregation of culture-positive, mycoplasma-infected cows as a separate group. Mycoplasma-infected cows will always stay in this group.

- Establish a milking order so all infected cows are milked last or with separate equipment.
- Intensive culling of infected cows.
- Review mammary infusion practices to insure proper technique.
- Use only sterile, commercially available infusion products for intramammary treatments.
- Begin a monitoring and surveillance program.

What preventive measure can be taken to prevent a mycoplasma serious outbreak?

Begin a surveillance program for mycoplasma by setting up a milk culturing system to include:

- All new herd additions,
- Any cows returning from shows or exhibitions
- All fresh heifers and cows
- All clinical cases of mastitis
- Monthly or more frequent bulk tank milk

By culturing milk in this manner, any new mycoplasma entering into the herd will be detecting quickly before a serious herd problem can occur. Keep in mind that all new herd additions or any animals that have been off the dairy should be considered infected with mycoplasma until proven otherwise by SCC and culture.

Teat dipping and dry cow therapy will have no effect on the incidence of mycoplasma. However, both practices should be continued to prevent and control other contagious mastitis pathogens.

**This is one in a series of bulletins on mastitis control in dairy herds. Contact your county Cooperative Extension Service office for information on other forms of mastitis and how to control them.**