

## GETTING THE JUMP ON MYCOPLASMA OUTBREAKS

Allan Britten  
Udder Health Systems, Inc.  
Bellingham, Washington

Would you be ready for a mycoplasma outbreak in your herd? You may wonder if it is even likely to be a problem on your herd. Maybe you have not heard about it in your area, or you think those dairies that got the disease must have done something to deserve it. Maybe you feel you have a closed herd and your biosecurity measures will keep it away. Well don't rest too easy. There is reason to think that the face of the disease is changing.

### Not Just Big Dairies

Mycoplasma mastitis is not just found in big dairies and not just in California. The situation today is that it has been reported in every state of the country. California does have a longstanding awareness of this disease going back to the 70's. California dairies probably enjoy the most extensive network of diagnostic services for this organism with many university, processor and veterinary laboratory services offering mycoplasma culture as part of routine Bulk Tank Culture (BTC) and cow screening programs. Laboratory services in New York have also been active in looking for the organism as a cause of contagious mastitis outbreaks for many years. In the 1980's the organism had been detected in tanks in the Pacific Northwest only infrequently, but clearly detection is now on the upswing. By the turn of the century, about 20% of Northwest herds show the organism in the bulk tank at some point during the year. Similar increases in frequency of detection have been reported in testing laboratories in the Midwest. It is likely that although it is a relatively rare form of mastitis, it would be detected in more areas of the country if more dairies ran mycoplasma culture. It's not just a large herd problem. Yes, larger herds can have larger problems, but this organism does not care about herd size. Is your herd really safe? Some dairy's feel safe because they have a closed herd. The organism is finding a way into many herds that thought they were "closed." Every year at Udder Health Systems we get calls from producers that complain "I don't know how it got in here. I haven't bought any cows for years."

Mycoplasma mastitis organisms are one of the three major contagious mastitis causing pathogens which also include Staphylococcus aureus and Streptococcus agalactia. At Udder Health Systems we call these the MP3 (3 Major Pathogens). They merit this classification because they are highly contagious and can cause major damage to the mammary gland. The MP3 have a reputation of causing explosive outbreaks where large numbers of animals become infected in a short period of time. On progressive dairies most managers are properly focused on preventing damage from Staph aureus. This is by far the most common of the MP3 mastitis problems. Mycoplasma mastitis has clearly established itself as the #2 MP3 concern for managers and has far surpassed Streptococcus agalactia as cause of contagious mastitis. Fortunately, in areas where the disease does frequently show up, it does not always result in explosive outbreaks. It is bad enough when you lose one or two cows to this disease and this is what happens most of the time. However, you may be so unlucky as to have one of those really bad outbreaks and the cost of the

disease could skyrocket from the tens of thousands to the hundreds of thousands of dollars in a single outbreak.

### Finding Out If You Have Mycoplasma

How do you know if you have Mycoplasma mastitis? One important step is to look for clinical mastitis. Mycoplasma infection will frequently cause clinical mastitis and clinical signs will likely be detected in over 80% of the cases. Clinical signs include a drop in milk production and the observance of severely abnormal stringy or granular thick secretion. In its most dramatic form, mycoplasma may infect all four quarters of a cow and milk production may completely stop, although cases that severe probably occur less than 20% of the time. Clinical Mycoplasma will be unlike acute coliform mastitis as there is little or no swelling in the gland and the cow usually does not appear toxic. Mycoplasma may sneak up on you as a milder case that may look like any other chronic or subclinical mastitis. With some cases the cows may never have been known to have clinical signs. A common complaint about the mastitis cases during an outbreak is that they don't seem to get better with antibiotic therapy. Non-responsive mastitis cases should make you wonder if mycoplasma is the culprit. This is because the disease is not treatable and antibiotics have no effect on the organism. Don't look to your bulk tank quality reports to tell you that you have a problem with mycoplasma. It does not grow on Standard Plate Count media so you will never get an elevated SPC caused mycoplasma organisms. Mycoplasma mastitis cows usually do have a high somatic cell count. However, since such a high percentage of Myco cows end up in the hospital due to a drop in milk production or clinically abnormal milk, Myco outbreaks don't usually affect your bulk tank somatic cell count. Many herds experience a low or normal bulk tank SCC even when they are in the middle of an outbreak.

Mycoplasma won't show up on a routine mastitis bacteria culture. In order to find out if you have mycoplasma mastitis, it needs to be diagnosed with a special separate mycoplasma culture. The test for this organism requires special media, equipment and laboratory skills. Even in laboratories that offer this service, mycoplasma culture may not routinely be offered as part of their standard individual cow milk culture or BTC service. If you want to test your individual cow or bulk tank milk for this organism, you must specifically check with your laboratory to be sure they offer this service and then specifically request a mycoplasma test. Also mycoplasma growth in the laboratory is typically not impeded by the presence of antibiotics. This is one situation where it is appropriate to consider sampling cows even after antibiotic treatment has been initiated. It is always good hospital management practice to take a milk sample from clinical mastitis cows before initiating treatment. But if you are just starting a mycoplasma investigation, don't hesitate to sample all the cows in the hospital even if they are on antibiotics. Whenever your laboratory reports a positive infected cow, consider it a potential threat to the health of the whole herd. This organism is highly contagious and one infected cow can lead to more.

### The Slow Growth Problem

Mycoplasma culture is different from regular bacteria culture as this is a slow growing organism requiring seven to ten days of incubation to confirm a negative sample. In most laboratories, when you submit a sample for standard mastitis culture and mycoplasma culture, the standard

bacteriological results are reported within 2-3 days. Many laboratories will check the mycoplasma culture early and sometimes the growth of this organism is detected so it can be reported at the same time. The majority of time however, the laboratory analyst will have to wait 5-7 days before growth can be detected. In some cases, cultures that are checked at day 7 will be negative but will clearly show positive by day 10. The herd manager who is trying to protect his herd from an outbreak needs to anticipate the challenges caused by this delay in reporting. It certainly dictates a need for cautions handling of the milk from clinical mastitis cows until all the laboratory results come back. This includes extraordinary milking time sanitation precautions to prevent cow to cow transmissions such as the use of disposable latex gloves and the ready availability of disinfectant solutions to sanitize hands and milking clusters.

### Routine Bulk Tank Culture

The first notification most dairymen get that there is mycoplasma in their herd is a call or a report from a laboratory that the organism is present in their bulk tank milk. When you do find out that you have a positive mycoplasma result, you need to understand what the test means, the nature of mycoplasma in the dairy industry, and what steps you can take to minimize losses from this disease causing organism.

Most cows with intramammary mycoplasma infection will shed billions of organisms in each milliliter of milk at least for a period of time in the early course of the disease. Because of these high shedding rates, it has been known for many years that mycoplasma from even one of these infected quarters in a thousand cow dairy is likely to be detected with BTC. This gives us an opportunity to take advantage of the single most important tool to protect your herd from this organism: routine BTC. This is a powerful early warning tool to help you detect the beginning of an outbreak. Make sure a bulk tank culture is done on your herd at least once a month. Some larger herds may wish to test weekly to keep up with the changing status of the herd. This is not a test where you get your negative test result and say “Well, I don’t have a problem so I don’t need to run that test again”. The purpose of routine testing is to put a vigilant monitoring system in place so you are likely to catch that first case whenever it comes – next week, next month, or next year. Just be happy if all the test results come back negative. If the test does come back negative it may be a false negative. The myco cow may be in the hospital or in the dry herd on the day of the BTC. The cow may go into a low shedding phase after a few weeks of infection and dilution in the bulk tank may make it unlikely that the laboratory can detect the organism. If the tank is positive then it almost always means you have mycoplasma mastitis in the herd. A false positive may occur if the tank is contaminated by one of the non-mastitis causing strains such as *Acholeplasma laidlawii*. This is why it is advised to run a speciation test on the isolate that comes from the positive tank sample. But even when a tank is positive due to milk from an infected cow, it may seem like a false alarm as no source of the infection is ever identified. The offending cow may “recover” and stop shedding. By the time the tank result is reported to you, the offending cow may have culled or are dry. It is a reality that for any number of reasons, in a high percentage of bulk tank positive herds, the offending cow is never found.

Fortunately, most positive tanks don’t mean there will be a major herd outbreak but specific steps should be taken immediately to prevent the disease from spreading. When you get a

positive BTC, you may be thinking “I may have a problem and I need to jump on it.” The question is how high to jump? This is when we recommend going to a Phase 1 response.

### Getting Organized

#### *Phase 1: Is there an outbreak threat?*

If you get a report of a positive bulk tank, you need to immediately begin a more detailed investigation to get “the jump” on a possible mycoplasma outbreak.

1. If your tank is reported positive, request that the laboratory perform a typing test to verify that the organism from the tank is a mastitis causing strain. The special media used to screen for mycoplasma in the BTC may grow some strains that don’t cause mastitis.
2. Repeat the tank culture immediately to see if the problem is persisting. Try to isolate individual strings and do a composite string sample to see which groups of cows are affected. A composite string sample is a pooled sample from all the cows in a pen. If this pooled sample goes positive then there must be a positive animal in that group. Try to freeze all cow movement between strings until these results are complete and positive animals isolated. Switch to weekly bulk tank testing to get more frequent updates on the status of the herd.
3. Submit individual cow milks for mycoplasma culture from recently or currently treated clinical mastitis cows, recently fresh cows and heifers, and all new herd additions.

If the mycoplasma typing comes back that you have a mastitis causing strain or if you get a second positive from the repeat BTC, any of your composite string samples or from individual cows, then you must prepare for more aggressive action: go to a Phase 2 response.

#### *Phase 2: The Chase*

In Phase 2, we begin the chase. This is a contagious organism. Our goal is to track down and eliminate the cows that are shedding the organism faster than the organism is spreading. It is an awkward chase because when we culture a group of cows, it is like taking a snapshot of the herd infection on that day. But because of delay in turnaround time for this type of culture, it may be days before we start getting results. So we also have to simultaneously increase frequency of detection (hence more samples) and also take steps to lower the new infection rate with superior sanitation steps (use of gloves, single towel per cow, sanitizer in drop hoses, generous application of effective pre and post dips, and cluster disinfection).

1. Culture all the cows in any positive strings. A string is considered positive for two reasons: a.) If it was the string where a positive myco cow last milked before she was detected or b.) If it is the string from which a myco positive string culture was obtained. Consider the value of a whole herd culture to identify all infected animals in the herd at one time. Finally, begin routine culturing of all cows and heifers on the day of calving.

2. Get advice from your veterinarian on milking time sanitation and begin sanitizing the milking cluster after every cow is milked. Get advice on “barrier nursing” techniques for managing sick cows in the hospital string. All milkers should be wearing latex gloves and they should use effective sanitizing solutions to wash their hands frequently.
3. Spread of this organism in the hospital is a big problem in many herds. Start sampling all cows that enter the hospital and also as they leave the hospital. They may have entered the hospital with only a bad foot, or uterus problem but they may leave with a mycoplasma infection.
4. Sample the bulk tank once a week for mycoplasma culture for at least four months after the last positive cow.

Udder Health Systems recommends continuing the weekly composite string samples and culturing all cows in positive strings until all the cows in that string are shown to be culture negative. Continue weekly mycoplasma BTC for at least four months after the last positive culture. Once a herd has had an experience with mycoplasma mastitis, they should continue to monitor all fresh cows and heifers and clinical cows as part of an ongoing monitoring system.

#### Watch Out For Hospital Spread and Fresh Heifers

Do not fail to culture every cow that goes into the hospital and every cow that leaves the hospital even if that cow did not go in there for mastitis reasons. The hospital is a very dangerous place for a cow during one of these outbreaks. The evidence is that in many outbreaks, transmission in the hospital is playing a major role in the problem. To cool off an outbreak you must sample very frequently in this group and get the positive cows out of the herd promptly. Don't get your fresh cows mixed up in the hospital. Milk fresh cows and heifers in a separate group and do not even handle them in the parlor at the same time you are working with the hospital cows.

It is important to say that you shouldn't be buying replacement cows for your herd without culturing them first. Sometimes an outbreak will be traced to a purchased cow. But don't forget the heifers. It also has been frequently observed in dairies that routinely culture their fresh animals, that 1 or 2 heifers in every thousand calved that will show the infection, and these shedding heifers have started mycoplasma outbreaks. Finding these shedders in the first weeks of lactation has been a key early warning signal to preventing whole herd outbreaks. This may seem like a low risk problem in small dairies but in larger herds they will find a myco positive heifers every year. Some of these heifers have recently been purchased. Some of the heifers are those that were raised at the dairy and it is unclear how or when they came to be infected.

Don't even think about living with this type of mastitis. Cull these mycoplasma mastitis cows immediately. Progressive herd managers everywhere should test the bulk tank for this organism at least once a month. An even better plan is to also routinely culture all new additions and all fresh cows and heifers to get an early warning for this dangerous and potentially expensive mastitis organism.