



## MYCOPLASMA MASTITIS<sup>1</sup>

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Mycoplasma mastitis was first reported in the United States in Connecticut (9). Today, it is found in every state that tests for it (6).

### Clinical Signs of Mycoplasma Mastitis in a Herd

Symptoms characteristic of clinical mycoplasma mastitis (3) are:

1. An increase in clinical mastitis cases that do not respond to treatment, while the cow remains healthy.
2. Multiple quarters with clinical mastitis.
3. Reduction in milk production.

Cows that culture positive for mycoplasma need not be sentenced to death. Milk production may in many cases return to normal and cows may be productive in the current and subsequent lactations (7,8). Cows may intermittently shed increased somatic cells, and a mycoplasma cow may always be a mycoplasma cow (10). The purpose of this paper is to try to raise questions about current control recommendations. As herds get larger and many of these dairies will no longer have "closed herds", the traditional methods of dealing with this disease may need to be revised.

### Florida Mastitis History

#### 1982 Survey

In 1981-82 a Bulk Tank Survey (4) was done on all 400 dairies in Florida. Milk samples were collected by the State of Florida Division of Dairy Industry, and sent to the (then) New York State Mastitis Control Program for analysis. Only 2 herds out of 400 were positive. All positive herds were retested. Of interest to me was the apparent lack of concern on the part of owners and management from the positive herds. Upon hearing the results the response was so what?

#### 1985 Survey

In 1985 a survey of central Florida dairies was done. One hundred and thirty-two dairies were surveyed (12), 11 (8.3%) were positive for mycoplasma. We promptly sent the

<sup>1</sup> Adapted from National Mastitis Council Proceedings 02-97 titled "Approaches to Achieving and Maintaining a Herd Free of Mycoplasma Mastitis".

results to the dairymen, milk plant personnel, veterinarians and Extension Agents, explaining how they could sample the whole herd and cull all the positive animals. Their response was that we could go back north and take a few Canadians with us. About the same time we began to culture mycoplasma in bulk antibiotic treatment bottles. Since dairymen were unwilling to culture and cull positive cows, we attempted to get them to stop using bottle mixes and to do a good job of post milking teat dipping. We also advised that they cull any cow with more than 2 quarters with clinical mastitis or a significant drop in milk production. Today, eleven years later, 9 of the 11 herds are still in business and the 2 that are gone did not leave due to mycoplasma. None of the herds had backflushers or segregated their cows in any way.

### 1985 Field Trial

In 1985 we conducted a field study in a large Florida dairy affected with mycoplasma mastitis (5). Herd string and individual cow milk samples revealed that 126 cows of 1,535 in the herd were positive for Mycoplasma bovis. Infected cows were maintained in a mycoplasma mastitis subherd and were milked at the end of each milking session. Of the 126 cows in the subherd, 22 (17.5%) were culled for mastitis, 35 (27.8%) were culled for low production, and 9 were culled for other reasons. Of the remaining 60 cows, only 16 (12.7%) cows remained culture positive for mycoplasma. However, despite being positive for mycoplasma these cows remained clinically normal. Further, there was no significant difference in milk production between infected cows and uninfected (control) cows in the main herd. Most cows re-entered the main herd in the following lactation.

### Florida 1985 to the Present

Over the past 10 years we have continued to deal with mycoplasma positive herds, there always seems to be herds with mycoplasma. Of the herds we monitor that purchase animals, mycoplasma may appear once a year or every 2 years. Most herds persons on these dairies can easily find the cow; more than 1 clinical quarter, drop in milk production, she is culled - end of story.

### Bulk Tank Monitoring

We have encouraged weekly bulk tank analysis on farms over 1000 cows, and smaller herds every 2 weeks to a month. About 180 herds in the Southeast U.S. do this routinely (1). The beauty of this system in Florida is that for the last 15 years 1 person has read almost every plate, which gives consistency. The other advantage is that if one keeps track of which cows entered the milking herd that week and if any contagious pathogens are present, it does give a good idea of who the culprit is. This also has an advantage with Streptococcus agalactiae, which is our biggest mastitis problem at this time. Although we encourage dairymen to get a bulk tank sample from a herd they are purchasing, this is often not possible with a "load" of animals that you have no idea where they came from. Segregation of new animals is generally not practiced on many large dairies, and neither is sampling of fresh or new cows entering the herd. If a record of the animals in the "load"

is recorded, and if contagious mastitis offenders are found, the whole "load" can be checked.

### 1996 Mycoplasma Herds

This year has brought about some strange happenings, finding the reason for outbreaks, hoping that this might prevent other outbreaks seems more interesting than mass executions.

#### Herd #1

A 2000+ cow dairy milked in a double 30+ parallel parlor, 20,000 lb. herd average, cows housed in Florida feed barns, replacements have been home and out of state raised and heifers and probably some cows purchased, cows on a monthly bulk tank analysis; pre and post teat dipping with teat dip cups. 1995 positive bulk tank sample on 01-11-95, negative again until November and December, 1995. Treated cows and fresh cows were milked in a separate parlor, while the big parlor had regular maintenance and pulsators checked every several weeks, the hospital parlor in June had a pulsator controller box that was not wired correctly and the ratio varied from 60:40 to 40:60 at random, I have no idea how long this was this way. All mastitis cows and fresh cows in the mastitis herd were sampled for mycoplasma weekly from then on.

Of the 4690 samples 173 were positive for mycoplasma and these cows were culled. Approximately 15 cows were sampled twice (repeat samples). These cows were all ages and stages of lactation. There were 146 positive cows from 01-03-96 to 06-07-96 when the whole herd was string sampled, 9 of the string samples (16 cows per string) were positive. Those individual cows were all resampled 06-26-96. All were negative on that test. In that time frame between sampling 9 cows were diagnosed positive - its unknown if these positive cows were in those strings, from my records they were not but that is a guess. From 06-07-96 sample to November, only 27 more positives were found.

The cost of this year long episode was quite high. There were 4690 samples taken at approximately \$3.00 each = \$14,070, not counting labor. It costs about \$900 to replace a cow at current beef prices.  $173 \text{ cows} \times \$900 = \$155,700$ . These cows were culled on one positive sample regardless of clinical signs. If in the earlier field trial (5) one half of the these animals could be saved, and continue to produce, about \$80,000 could be saved.

#### Herd #2

A 1500 cow dairy with a #16,100 herd average, cows housed in Florida feed barn and earthen lots and also cooling ponds. Milking equipment functioning to specifications, 2 double 12 herring bone parlors, pre and post dip with cups. Mastitis and fresh cows milked in main parlors, cows were calved in the mastitis lot housed in a 20'x50' roof covered poorly drained sand lot. This herd was mycoplasma free on bulk tank samples from April 1996 to August 1996.

This herd was visited on 10-23-96, of the 38 positive cows through 10-15-96, most all were fresh animals, which had calved in the mastitis cow lot, cows moved there earlier this year to calve since it was close to the barn and shaded. The rest of the positive cows were all mastitis cows that had been in that lot. The lot was cleaned and fresh sand was added before I left the dairy and I never got a sand sample. The lot was quite wet and dirty. All positive cows since 10-23-96 had previously been in that lot. The mastitis cows are now housed on a separate lot, cows are now calved in grass lots.

Since no sand sample was taken, we can only speculate that cows got the mycoplasma from that sand lot. This agrees with other speculation that herds cut off teats of mycoplasma quarters proceeded to seed the ground with mycoplasma with leaking milk.

This herd had lost a couple hundred cows 10 years ago to mycoplasma, so no bottle mixes have been used in 10 years, dry cow therapy has been done continually. This dairyman is going to cull anything that sounds like mycoplasma, which is his choice.

### Herd 3

A 370 cow dairy with a 17,500 herd average, cows milked in a double 8 parlor, 8 of 16 pulsators were not closing due to old age and cobwebs, stray voltage 1.1 volts AC claw to milk line, and poor vacuum controller response. Cows on pasture with shade cloth and big cooling pond. Pre and post dip with iodine in cups.

This herd was visited on 10-21-96, the pulsators were fixed and vacuum controller replaced within 3 days. In this case it looks like the pond was the cause, many cows had teat end problems due to limited massage phase due to half of the pulsators malfunctioning. Mycoplasma has also been found in a cow wash pond in Florida (1), all stages and ages were infected. This has been a closed herd for the past 13 months. This was the only herd of the 3 with an elevated cell count, about 20 high cell count cows were culled between the 10-10-96 and 10-15-96 samples. This outbreak lasted about 40 days, claimed 20 cows, ponds drained until next year.

### Summary

Mycoplasma is probably here to stay, as herds get larger and many will lose their "closed" status, outside heifer raising, purchasing of replacement animals all bring about more chance of outbreaks. Mycoplasma is found in young calves fed infected milk (2) and lives in the respiratory tract of normal cows. It is believed that it can be spread from the lungs to the mammary gland (11). Gonzales (6) states that the highest frequency of clinical mycoplasma is in the winter in New York. In Florida (1) most of the outbreaks are in summer when cow comfort is worst and stress is highest.

## Our Message

We must live with mycoplasma, thus, we believe we must take measures to lessen its economic effect on the dairy. Once diagnosed in a herd the dairyman should not be left with a 1980 Fact Sheet, told to buy backflushers and sample his herd and depopulate it. Just as with an outbreak of "milk fever", no one would say just give every cow a bottle until it stops, we need to find the reason for this outbreak. We propose several approaches, and let the dairy owner decide based on what is known. Mycoplasma management approaches by degrees of difficulty start at 1 and continue to your comfort level. We should inform the dairyman of his options and make an educated decision on what is best for him.

1. Use no "bottle mixes" to infuse quarters, do an excellent job of post milking teat dipping with a dip cup. Reduce stress (cold-hot), overcrowding, etc.
2. Cull all cows with clinical mastitis in more than 1 quarter or drop below your level of profitable production. Remember as herds get larger, the owner may not treat cows anymore, it is important to monitor the mastitis herd, some cows live there.
3. Monitor the bulk tank on a regular basis, 1000+ cows once a week, 500-1000 cows every 2 weeks, less than 500 cows once a month, record dates of cow entering the lactating herd so new animals can be identified. I consider every herd has mycoplasma in it if: ever bought an animal, ever had heifers raised off farm, ever took an animal to a fair or show, ever had a milker other than a family member, ever had a visitor to a dairy. When a positive bulk tank occurs see #2 above, if stays positive - check for cause.
4. We would conclude that when 1 or several cows are positive twice for mycoplasma - they should be culled, in "outbreaks", cull on clinical signs. Milk the survivors.
5. Culture and isolate all new animals until tested - will only find "shedders".
6. Culture everything and cull positives regardless of evidence of clinical mastitis, its only the dairyman's money.

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Table 1. Weekly Sample Results.					
Date	# Positive Cows	# Cows Sampled	Bulk Tank Mycoplasma	Mastitis Tank Culture	Bulk Tank SCC
01-03-96	5	74	+	+	---
01-10-96	1	117	+	+	300,000
01-17-96	12	72			
01-24-96	6	66			
02-07-96	2	55	+	N/A	326,000
02-14-96	2	61			
02-21-96	4	71			
02-28-96	1	74			
03-06-96	1	83	+	+	345,000
03-13-96	3	57			
03-20-96	3	79			
03-27-96	3	55			
04-03-96	2	74	-	-	318,000
04-10-96	8	58			
04-17-96	17	101			
04-24-96	8	50			
05-01-96	12	53			
05-08-96	6	62	+	+	400,000
05-15-96	15	170			
05-22-96	10	61			
05-29-96	23	60			
06-07-96	2	67	+	+	330,000
06-07-96	9 out of 132 string samples positive				
06-12-96	4	87			
06-19-96	5	259			
06-26-96	resample of 9+ string samples 0+				
07-03-96	1	125	+	+	200,000
07-10-96	0	105			
07-17-96	1	67			
07-24-96	0	99			
07-30-96	0	126			
08-06-96	0	108			
08-14-96	1	137			
08-20-96	1	153			
08-28-96	1	100			

Table 1. continued.					
09-03-96	1	250			
09-10-96	1	127	+	+	330,000
09-17-96	1	129			
09-25-96	2	142			
10-02-96	1	124			
10-08-96	2	49			
10-15-96	3	121			
10-23-96	0	156			
10-29-96	0	122	+	N/A	500,000
11-05-96	0	134	+	+	336,000
11-12-96	1	120			
11-19-96	1	98			
<b>Total</b>	<b>173</b>	<b>4690</b>			

Table 2. Bulk Tank Analysis (Mycoplasma cows sampled in mastitis herd)				
Date	# Cows sampled	# Positive cows	Bulk Tank Mycoplasma	Bulk Tank SCC
08-27-96			-	300,000
09-12-96	37	20	+	300,000
09-17-96			+	330,000
09-24-96	4	9	+	350,000
10-01-96			+	256,000
10-08-96	3	3	+	360,000
10-15-96	10	6	+	290,000
10-22-96	30	11	+	290,000
10-29-96	28	11	+	240,000
11-05-96	18	4	+	330,000
11-12-96	14	3	+	200,000
11-19-96	20	2	+	360,000
11-26-96	11	1	+	210,000
<b>Total</b>	<b>175</b>	<b>70</b>		

Table 3. Bulk Tank Analysis Results				
Date	# Positive Cows	# Cow sampled	Bulk tank Mycoplasma	Bulk tank SCC
10-10-96			-	595,000
10-15-96			+	385,000
10-29-96	1	2		
11-12-96	19	34	+	
11-26-96	0	12	-	---Pond +
<b>Total</b>	<b>20</b>	<b>49</b>		