August, 01

In this Issue

Mycoplasma Mastitis

Larry Fox, Professor
College of Veterinary Medicine
Washington State University

Mycoplasma species

Microbes of the genus Mycoplasma are unusual mastitis pathogens and similar to the other common mastitis pathogens, such as the coliforms, the staphylococci, and the streptococci, mycoplasma-all are bacteria. However, unlike these cousins, Mycoplasma sp. is slow growing, have high nutrient requirements and lack a bacterial cell wall. One could hypothesize that given their unique physiology that they would be fastidious and less likely to cause infection, lest they arouse the ire of the cow's immune system. Yet, surprisingly, often the opposite is true. Mycopolasma sp. can be found colonizing several different body sites without causing disease, The factors that influence whether mycoplasma cause disease or just sit and colonize these body sites, are unknown.

Mycoplasma sp. is slow growing and have high nutrient requirements, thus are difficult to detect. They often "dip below the radar screen" and can cause mastitis in a herd for some time before detection. Mycoplasma mastitis is contagious, spreading from cow to cow quite readily. Given their unique physiology, mycoplasma-causing mastitis is difficult to remove by treatment. Thus the thrust of this article will be to describe detection, control and prevention of mycoplasma mastitis.

Introduction

Over the last 2 years, the prevalence of mycoplasma mastitis seems to have in creased more than four-fold in terms of the number of dairy farms reporting this disease through bulk tank milk cultures. The reasons for this increase are not clear. Our research group is currently studying the situation. From our efforts we have determined that approximately 70% of the herds are free from this disease within the first month of identifying the case of mastitis. Of the remaining 30% of herds, some take as long as 11 months to become mycoplasma mastitis free. This would indicate that most herds have adequate mycoplasma mastitis detection and control strategies.

Detection

The preferred method to monitor a herd's mycoplasma mastitis status is through routine bulk tank milk cultures. The appearance of Mycoplasma species in bulk tank milk, as revealed by culture for microbes, is almost exclusively a result of having cows with mycoplasma mastitis in the herd.

The search must start for the individual infected cow(s) once it is known that a herd has a positive bulk tank mycoplasma mastitis sample. The usual suspects are the cows with clinical mastitis, hospital pen cows, and high somatic cell count cows. If culturing milk from the suspect cows identifies the mycoplasma positive cows, then these mycoplasmas cows should be removed from the herd. The bulk tank milk should be re-cultured, and if re-cultured, and if re-culture fails to identify mycoplasma, than the dairy manager can be confident that most, if not all mycoplasma cows have been removed. However, if subsequent bulk tank milk cultures identify mycoplasma sp., then further searches for mycoplasma mastitis cows must be made. The search to identify mycoplasma cows can be done by sampling

the bulk tank milk after each string of cows is milked.

An example scenario: after the first string of cows are milked, a bulk tank sample is collected; then after the second string is milked, a second sample is collected; after the third string is milked, and so on. If the first string sample is mycoplasma positive, then those suspect cows, highest somatic cell counts and/or cows with recent slumps in production, should be sampled. Alternatively, all cows in the string could be sampled and their milk cultured for Mycoplasma sp. It would not be necessary to culture the milk of subsequently milked strings until mycoplasma cows in the first string are identified and removed. Clearly, the milk from cows in the first string that were identified as Mycoplasma sp. positive, would "contaminate" the milk of the second string.

This procedure of repeated string bulk tank milk cultures, followed by individual cow cultures, must be continued until all cows in each string have been identified and removed. There are other methods that can be used to identify cows with mycoplasma mastitis. The herd's veterinary practitioner should be contacted when establishing protocols to identify mycoplasma mastitis cows.

The preceding discussion emphasizes the need to routinely have bulk tank milk cultured as a method of mycoplasma mastitis surveillance. An assumption is that cows with mycoplasma mastitis shed millions of bacteria per milliliter of milk. Thus, a single cow with a mycoplasma mastitis infection will shed enough organisms to be detected in a bulk tank sample from a herd that is otherwise mycoplasma mastitis free. However, data from our laboratory suggest that often cows with mycoplasma mastitis have shedding rates that are low, and the result is these cows would not increase a bulk tank mycoplasma count sufficiently to indicate there is mycoplasma mastitis in the herd. Thus, a dairy manager who consistently follows the bulk tank culture program may mistakenly feel that the herd is free from mycoplasma mastitis, when at times there may be a few cows shedding Mycoplasma sp. at very low numbers into the milk.

Producers should not be discouraged from having their bulk milk tested regularly. Although bulk tank culture is not 100% sensitive, it still helps a dairy manager keep a finger on the pulse of the operation. I feel bulk tank culture in general is reasonably sensitive in detecting all contagious mastitis pathogens, especially when done routinely, such as weekly.

Prevention and Control

Classically, it was thought that Mycoplasma sp. behaved similarly to other contagious mastitis pathogens, that they were transmitted at milking time and that new cases were the result of introducing carrier animals into the herd. It was generally believed that milking time hygiene, and good biosecurity measures were all that were needed to protect a herd from mycoplasma mastitis.

However, numerous recent research publications suggest that outbreaks are not always a result of a breakdown in milking time hygiene and biosecurity. Often, findings from these recent studies suggest that the source of the mycoplasma mastitis outbreak was from an infection at a different body site than the udder. Thus, new methods would need to be developed to control the transmission of this disease if indeed the source is not always and infected mammary gland. Studies to further determine the sources, modes of transmission, and the development of new intervention strategies is the focus of our research efforts at Washington State University Field Disease Investigation Unit.

Strategies to control the disease need to be employed once the dairy manager has identified the cow with mycoplasma mastitis. Although the primary source of the disease may not be the mammary gland, it is believed that most mastitis infections will spread to naïve cows, cows that do not carry the agent at a non-udder site, during milking time. As a result, the mycoplasma mastitis cows must be isolated from the rest of the lactating herd. Since the mycoplasma agent is often refractory to treatment, it is best to rapidly cull the infected cow from the herd. A report from New York suggests that with excellent milking time hygiene, herds can keep mycoplasma cows in the lactating string. However, most mastitis authorities would likely argue that control is best maintained when cows with this disease are culled quickly. Our experience suggests that mycoplasma mastitis cows are generally excellent cull candidates. They are often infected in more than one area and suffer from a rapid drop in milk production.

Summary and Conclusion

Mycoplasma mastitis seems to be increasing in prevalence. The best method to keep a finger on the pulse of the mycoplasma mastitis situation in a herd is to perform routine bulk tank milk cultures. The appearance of Mycoplasma sp. in the culture indicates that cows have mycoplasma mastitis. However, bulk tank milk cultures may yield false negative results. At times cows with mycoplasma mastitis may be shedding this pathogen at very low levels, not detectable in bulk tank milk. But, with routine, perhaps weekly bulk tank cultures, a dairy manager should feel confident that mycoplasma mastitis problems would be revealed. Once revealed, it is important that managers search and isolate infected cows, since mycoplasma mastitis is contagious. Yet, the source of mycoplasma mastitis may not be exclusively the mammary gland. If future research definitively identifies different sources of this pathogen, such as colonization at other body sites, then new strategies need to be developed to control and prevent mycoplasma mastitis.

JULY 2001 HONOR ROLL HERDS**

DAIRY	COUNTY	NO. COWS	LBS. ECM	2X 3X	Rolling Herd Average MILK	FAT	PROT	DOT
MACTOC FARM	OKTIBBEHA	192	73.0	2X	27554	864	819	07/04
HERITAGE DAIRY	TATE	427	65.0	2X	23406	940	717	07/11
CLEMMER AND HILL DAIRY	TIPPAH	151	59.8	2X	20461	749	617	07/09
MELVIN NICHOLSON	NEWTON	110	56.9	2X	21196	774	657	07/23
KNIGHTS DAIRY FARM	JONES	127	56.5	2X	20514	711	630	07/01
RONALD H CLARK	LINCOLN	69	55.6	2X	20814	788	636	07/16
DIXIE DAIRY SALES	CARROLL	341	55.4	2X	22297	1040	655	07/26
SPEAKS & SON	WALTHALL	271	53.9	2X	18435	698	566	07/20
CAL MAINE FOODS DAIRY	HINDS	1266	51.9	3X	19765	733	608	07/09
FREEMAN DAIRY	PIKE	143	51.1	2X	20127	700	625	06/29
MS STATE UNIVERSITY	OKTIBBEHA	171	50.3	2X	22382	875	692	07/25
TODD & JERRY BULLOCK	PIKE	98	47.7	2X	16719	586	508	07/01
COASTAL PLAIN EXP STA	NEWTON	161	46.1	2X	22128	821	666	07/22
J & L DAIRY	WALTHALL	208	45.9	2X	20201	782	610	06/25
ROWZEE JERSEY FARM	NEWTON	168	45.2	2X	16556	765	612	07/23
WALTER LAVIGNE	MARION	170	44.1	2X	17525	588	543	07/05
PAUL W EDWARDS	NEWTON	129	43.4	2X	18674	751	579	07/24
LEON BARDWELL DAIRY	LINCOLN	42	43.1	2X	20835	598	622	07/18
JOHN T MCREYNOLDS	OKTIBBEHA	114	39.1	2X	16101	570	485	07/12
NORTH MS BR EXP STA	MARSHALL	99	38.4	2X	19736	711	623	07/10
LARRY WALKER	NOXUBEE	108	38.3	2X	17836	590	537	07/22
MIKE GLYNN	MARION	64	37.8	2X	10788	461	379	06/25
DAVID NUNNERY	PIKE	125	37.4	2X	14706	480	438	06/22
SIMMONS DAIRY	MONROE	72	37.0	2X	15845	565	474	07/29
DAVID NUNNERY	PIKE	122	36.6	2X	14999	484	444	07/22

Top 25 herds enrolled on supervised DHIA testing programs by test day energy corrected milk for all cows.
****ECM = (.3246 x test day milk) = (12.86 x test day lbs. fat) = (7.04 x test day lbs. protein)**

—_—

Dr. Jim Tomlinson Retires

After more than 25 years of service as a Professor in the Animal and Dairy Sciences Department at Mississippi State University, Dr. Jim Tomlinson announced his retirement effective June 30. Dr. Tomlinson (Dr. T. to many who know him) came to MSU in 1975 and held a teaching, research, and extension appointment. Over the years, he taught courses in dairy science, conducted research in the area of dairy nutrition and provided dairy producers with feeding/nutritional recommendations for their herds.

Although he is retiring, Dr. Tomlinson will stay busy by continuing his nutritional consulting here in Mississippi and throughout the Southeast. We wish Dr. Tomlinson the best in his retirement.

—_—

Upcoming Events...

Sept. 8 -	Tupelo State Fall Dairy Show Lee Co. Ag. Complex, Verona, MS
Sept. 15-	Columbus State Fall Dairy Show Columbia, MS
Sept. 27-30	Mid-South Fair Dairy Show Memphis, TN
Oct. 11-13	Mississippi State Fair Dairy Show Fairgrounds, Jackson, MS

—_—

September Advanced Class I Milk Increases for 7th Straight Month

Dr. C. W. "Bill" Herndon
Dairy Economist, MSU

Dairy farmers are realizing that the upswing in milk prices during the first half of 2001 has started to level out and expected to decline as the year ends. Because of increasing milk production in response to this year's "higher" prices, almost all hope for record prices has disappeared and the industry is now expecting a downturn in dairy product and milk prices. History has shown that prolonged periods of hot weather severely curtailed milk output, which then dramatically affected prices. So, if July's extremely high temperatures across the Upper Midwest and West persist, this prediction for lower milk prices this fall/winter could reverse itself. For September, the Class III skim milk price was greater than the corresponding Class IV prices. The USDA reports that the September 2001 Advanced Class III Skim Milk price was $7.99/cwt. compared to the Advanced Class IV Skim Milk price of $7.24 /cwt. This difference between the respective Class III and Class IV prices (after factoring in butterfat prices) resulted in a $0.76/cwt. *higher* Class I base price ($18.58 vs.$17.82). On August 17, the USDA announced that the August 2001 Advanced Class I "base" milk price would be $15.56/cwt. After adding the $3.10 Class I price differential for the pricing zone which includes Atlanta and Starkville to this "base" price, the Advanced Class I milk price for September will be $18.66/cwt. The September Advanced Class I price was reported at $18.66/cwt. and is $3.72 GREATER than the September 2000 Class I price. Dairy producers need to remember that the September Class I price will be an important factor influencing the revenues derived from the sale of their milk produced during the month of September. Because about 65 % of Mississippi milk is processed into Class I products, farmers will not realize any additional revenues from this 16-cent increase in the September price until they receive their "settlement" checks in mid-October 2001.

Market Conditions. The dairy industry has been dealing with its annual struggle during the late summer to meet increasing demand in the face of decreasing supplies. In August, demand increases with the reopening of most schools across the South. Fluid milk consumption increases as children drink more milk through school lunch programs. During this period, cows produce less due to heat stress. These seasonal swings in demand and supply factors are the bane of the dairy industry. The fall months are characterized as when demand peaks while supply troughs (deficit season) in contrast to the spring season when demand is depressed and production is the greatest (spring flush). It is the uncertainty about the current demand–supply conditions that have caused butter prices to jump to $2.15/lb. and block and barrel cheddar cheese prices to rise to the $1.70 to $1.80/lb. range during the week of August 20-24. The USDA's July 31 Cold Storage report shows that inventories of butter fell 2% between June and July. Commercial holdings of natural cheeses were 3 to 8 % less than in June. So, Class I milk prices are predicted to increase slightly by 15 to 25 cents for October and then decrease $1.00 or $1.50 for November and fall another $1.00/cwt. for December. During the week of August, Florida bottlers imported 156 loads compared to 116 the previous week. Southeast milk handlers imported 211 truckloads from as far away as Arizona, Minnesota and Massachusetts during this the same week compared to 166 last week. In summary, the market tone for all dairy products are described as "firm to steady" indicating that tight milk supplies have dominated and will continue to influence the market through October. A lot of confusion exists about how milk output and supplies will rebound later in this fall when most analysts predict that milk prices will decline sharply. For instance on August 24, Class III futures contracts were being traded at prices as low as $13.98/cwt. for the November contract and $13.28 for the December contract. Grade AA butter futures contracts are above $2.10/lb.for nearby contract months but below $1.80 for the December contract. These factors should keep Class I milk prices (Atlanta/Starkville zone) near $18.70/cwt. in October with the market forecasting that prices for dairy products and milk will fall dramatically in December.

Milk Production. The extremely hot weather during July and early August, especially in the Upper Midwest and West, has curtailed milk output as much as 10-20% in some areas. July milk production was down 1.2% compared to July 2000 as farmers milked 98,000 fewer cows receiving 3 less lbs./cow. This summer's weather-related reduction in milk production has altered the recent trend of increasing milk output/cow and had the industry concerned about surplus milk supplies late this fall/winter. In general, milk output/cow has been 1.5% lower in 2001 compared to 2000. If this continues, this would be the largest 1yr. reduction in per cow productivity in more than 20 years. For the USDA 20 states monthly statistics, national milk production declined 1.2% between July 2000 and July 2001 where 72,000 fewer cows were milked that yielded an average of 6 less lbs./cow. Contrasting July 2000 vs. 2001 data found that eight states recorded increased output while 12 states (Texas, -9.5%; Missouri, -17.2%; Iowa, -7.3%) had decreased production; Indiana (+9.1%), Idaho (+7.7%), New Mexico (+8.7%), and California (+1.4) reported increases. Surprisingly, 2 of the 3 southeastern states in report recorded increased production. (Kentucky +2.2%, Florida +1.6%). The milk-feed price ratio is often used as an indicator when farmers have incentives to increase production. Many industry analysts believe that when this ratio exceeds 3.0 conditions exists for expansion of milk supplies. This milk-feed price ratio for July was 3.61 compared to 3.73 in June and 3.29 for July 2000. Thus, farmers continue to have an economic environment pushing them to boost milk production, although soybean and corn prices have increased slightly and lowered this ratio for July.

Dairy Product Prices. The dairy product price stability witnessed during June and July appears to be coming to an end as the usual summer and fall shortages of milk supplies have handlers and processors pushing up prices. There are

doubts about demand-supply conditions this fall that have caused most analysts to wonder what direction butter, cheeses and milk prices will follow for the rest of this year. The "bullish" market conditions of May have returned with the demand-supply squeeze. The general outlook continues to predict that dairy product and milk price will fall in November and December in anticipation of increasing milk output, with prices plummeting as much as $2.50/cwt. by the end of 2001. On the CME, 40# block prices that were reported at $1.67 on July 6 increased to $1.78 on August 24. Barrel cheddar prices have experienced several fluctuations during this period. The CME reported a cash price for 500# barrel cheddar cheese of $1.63/ lb. on July 6 compared to $1.68 on August 24. The butter market has been described as "firm" with Class II cream being valued around $2.70/ lb. Many processors believe that butter prices have been too high this summer, but expect them to remain stable for this fall. On July 6, grade AA butter price was $1.94/lb. compared to $2.15 on August 24. Since the USDA adjusted the butter-powder price, the industry had expected nonfat dry milk (NDM) price to fall 10+cents to the new support price of $0.90/lb. The market has been shocked by the fact that NDM prices have not plunged to the revised support level and, after falling several cents, have remained amazingly stable. The Grade A NDM has been traded on the CME at $1.00/ lb. for the past two months. Despite these factors, the USDA (via CCC) continues to make weekly purchases for non-fortified and fortified NDM ranging between one and six million lbs. during July and August. NDM processors, primarily in western states, are offering to sell these quantities to the CCC at the lower support price. NDM cash prices have remained well above the 90-cent support price in most regions of the country, particularly in the Southeast where NDM prices were ranging between $0.99 and $1.09/lb. in mid-August. CCC purchases have totaled almost 375 million lbs. since last October 1.

Near-term Market Outlook. Tight milk supplies due to increasing school milk demand and declining summer milk output has revitalized the market outlook. The usual late summer/early fall demand-supply squeeze has most industry experts wondering if the farm milk prices can be maintained and question how much they will decline before the end of 2001. As of late August, Class I milk prices are expected to remain near $18.50 -$18.75/cwt. Concerns about a persistence of the extremely hot summer could boost milk prices to as high as the $20.00/cwt. by October. However, the anticipation of mounting milk supplies this fall has most analysts predicting that milk prices will drop 10-15% by December and be reported near $16.00/cwt. for Class I milk in the Southeast Order. The price outlook for the next two months remains cautiously hopeful while the next 3 to 9-month outlook is worried of surging milk production and waning dairy exports. Tight milk supplies should persist as milk cows attempt to recover from the summer. The October Advanced Class I milk price for Mississippi (Starkville zone) is expected to be in the range of $18.50 to $18.75. The August Class III is also expected to remain at/near the July price of $15.46 and be reported near $15.50/cwt. The CME reported on August 24 that Class III (Class IV, in parentheses) futures contracts settlement prices were $15.55 ($15.04) for August, $15.75 ($15.50) for September, $15.00 ($15.15) for October, and $13.98 ($14.60) for the November contract.

Class III Replaces the Class IV Price as the Class I "Mover" Price. The Class I milk price for August and September 2001 was based on the Class III price for the first time. For the first 19 months of order reform, the Class IV advanced skim milk price was greater than the corresponding Class III price by an average of $1.91/cwt. and was as high as $3.61 during December 2000. These differences between the Class III and Class IV skim milk prices were the result of the methods established by the USDA in calculating the values of skim milk used in cheese production. Because butter prices have been much higher than cheese prices, these pricing mechanisms have led to Class IV being 20-30% higher than Class III. Thus, federal order areas where the majority of milk was used in Class III products realized much lower milk prices and dairy revenues compared to order areas with higher Class I Utilization. Upper Midwest dairy farmers with high Class III utilization rates experienced lower milk prices and pressured the USDA to revise the procedures to price milk sold under the federal order system. On May 31, the USDA announced that the support prices for butter and nonfat dry milk would be changed to revise the "tilt" or relationship between these two dairy products.

While this change in the "butter-powder tilt" has contributed to shrinking in the difference between the Class III and IV skim milk prices, the main reason is that cheese prices have increased substantially (70+% since January). Now that cheese prices are significantly higher than USDA support levels, Class III advanced skim milk prices have also catapulted up by almost 93% ($4.14 vs. $7.99) since last December. However, the change in the "tilt" has also led to an 8% decline ($7.88 vs.$7.24) in Class IV advanced skim milk prices during the last two months. Obviously, it was the size and persistence of the difference between Class III and IV skim milk prices that forced the USDA to revise the "butter-powder tilt." Changing the "tilt" and increasing cheese prices have resulted in the August and September Class I "mover" being based on the Class III advanced skim milk price. How has this revision in the "butter-powder tilt" affected Mississippi and Southeastern dairy farmers? Given the current milk class prices and their utilization rates, there appears that dairy revenues have not been adversely influenced by this pricing change, yet.

Southeast F.O. #7 "Blend" Price Increases 26 cents to $17.54 in July. The Southeast Federal Order Milk Market Administrator reported the July 2001 "blend" or uniform price for milk delivered in the Atlanta and Starkville "base" zone of Federal Order (FO) #7 was $17.54/cwt. (3.5% butterfat milk). North Zone is minus $0.20, North Central Zone is the "base" zone, South Central Zone is plus $0.20, South Zone is plus $0.30, and the Coastal Zone is plus $0.40/cwt. The July blend price of $17.54 for the base zone of FO #7 represents an INCREASE of 26 cents/cwt. The July 2001 blend price was $3.31/ cwt. For July, the respective butterfat

price and the average butterfat test for each milk class were: Class I, $2.21/ lb. and 2.25%; Class II, $2.20/lb. and 7.50%; Class III, $2.19 /lb. and 4.18%; and, Class IV, $2.19/lb. and 7.33%. Factoring the average butterfat test with the skim milk used in each of the four milk classes provides what this newsletter describes as the "net" milk price for each class of milk. The July blend price of $17.54/cwt. was determined using the following factors: (1) a "net" Class I price of $15.67 on 63.82% of the milk marketed; (2) the "net" price for Class II of $24.80 on 12.58% of the milk; (3) a "net" price of $16.42 on 17.05% of the milk used for Class III products; and, (4) the "net" Class IV price of $22.91 on 6.55% of the milk marketed. Because of the current exceptionally "high" prices for butter and butterfat, the "net" milk price for each class of milk reveals some rather remarkable findings.

Uniform or "Blend" Price for July 2001

North Zone:	**$17.34**
North Central Zone:	**$17.54**
South Central Zone:	**$17.74**
South Zone:	**$17.84**
Coastal Zone:	**$17.94**

Class I Price for September 2001 (advanced price)

North Zone:	**$18.46**
North Central Zone:	**$18.66**
South Central Zone:	**$18.86**
South Zone:	**$18.96**
Coastal Zone:	**$19.06**

Prices of Holstein Dairy Cattle Replacement

Location of Sale	Blansit, MO	Thomasville, GA
Auction Date	August 21	August 13
No. of Head Sold	229	370
Springer Heifers		
Supreme	$1,995	$1,800-$2,020
Approved	$1,600	$1,500-$1,800
Common	$1,190	$ 920-$1,220
Springer Cows		
Supreme	$1,300-$1,650	NA
Approved	NA	NA
Common	$770-$850	$ 640 -$ 780
Fresh Milking Cows		
Supreme	NA	$1,600-$2,040
Approved	$1,175-$1,300	$1,385-$1,600
Common	$650-$750	$ 600-$ 930
Calves 1-7 Days Old		
Holstein Heifers	$250-$475	NA
Holstein Bulls	$ 95-$125	NA
Combined	NA	$80-$410