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Dairy Lines

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Revised Dairy Cattle Nutrient Requirements
Workshop
Jan. 16-17
Manhattan, KS

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Prevention, early detection are keys to controlling mastitis

M.J. Brouk and J.F. Smith

Mastitis is the No. 1 health concern in the dairy industry today. It is not only costly to producers, but it reduces the value of milk for the processor and may affect consumer acceptance of dairy products. At the farm level, mastitis reduces production and milk quality while increasing drug costs, labor expenses, culling, and deaths. While producers often focus on treatment of clinical mastitis, it is more important to develop a mastitis control program that will reduce the number of subclinical cases. The key to effective mastitis control is preventing, detecting and correcting problems before a significant portion of the herd is infected. Producers should establish a monitoring system to identify future problems.

Don't Overlook Subclinical Mastitis

The first step in solving the problem is to admit that a mastitis problem exists in the herd. Many producers believe they are producing quality milk. But when bulk tank milk (BTM) somatic cell counts (SCC) are reviewed it is not unusual to see counts that range from 400-500 thousand/ml.

Is this quality milk? It depends upon your definition. The legal limit is 750 thousand/ml, so technically the milk is under the legal limit. But some processors discount milk with this level of SCC. Other countries have already reduced acceptable SCC levels to 500 thousand/ml. The United States may need to adopt the same standards to open export markets in various countries.

At 750 thousand/ml the milk is legal, but it could be better. Each producer should set a goal and work toward it. Many progressive dairymen strive to hold bulk tank SCC below 250 thousand/ml. A few aim even lower.

There are significant production increases associated with lowering SCC. Table 1 (page 3) outlines the expected lactation milk losses as SCC exceed 50 thousand/ml. Cows in the second or greater lactation are affected more than heifers. In heifers, a lactation average SCC of 400 thousand/ml is associated with a loss of 600 pounds of milk, while the same SCC level in a cow would be associated with a 1,200-pound loss.

Currently, the average SCC of Kansas herds on DHIA exceeds 400 thousand/ml. Based on this information, milk production of Kansas dairies is reduced by more than 1,000 pounds per cow per lactation. It is no wonder that states that lead in milk production per cow are also the states that exceed in milk quality as determined by SCC.

Many times producers are interested in the latest treatment for clinical mastitis. While effective treatment of clinical cases is important, they should know that subclinical cases generally are the most costly. Subclinical mastitis occurs when there are no visible changes in the udder, and the milk is free of visible abnormalities. The SCC is elevated and the presence of bacteria may be detected in cultures. These animals not only increase the BTM SCC, but serve as a bacteria reservoir leading to the infection of additional cows.

Producers should strive to maintain a bulk tank SCC of 250 thousand/ml or less. Counts above this level indicate a mastitis

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Heart of America Dairy Herd Improvement Summary (Oct)

	Quartiles				Your Herd
	1	2	3	4	
Ayrshire					
Rolling Herd Average	19,808	1,5926	1,3823	12,075	
Summit Milk Yield 1st	31.5	55.0	49.5	23.5	
Summit Milk Yield 2nd	78.5	70.0	58.5	49.0	
Summit Milk Yield 3rd	78.5	77.0	67.5	59.0	
Summit Milk Yield Avg.	44.0	67.5	59.0	55.5	
Income/Feed Cost	1,790	848	771	750	
SCC Average	157	269	373	181	
Days to 1st Service	40.5	117	65.5	119	
Days Open	151	135	159	148	
Projected Calving Interval	14.2	13.6	14.4	14.1	
Brown Swiss					
Rolling Herd Average	19,850	16,872	15,321	12,493	
Summit Milk Yield 1st	62.0	55.6	52.2	48.3	
Summit Milk Yield 2nd	75.2	64.8	69.2	57.8	
Summit Milk Yield 3rd	84.0	75.3	69.0	64.3	
Summit Milk Yield Avg.	73.6	65.0	63.8	57.3	
Income/Feed Cost	1,540	1,299	1,080	981	
SCC Average	506	375	273	378	
Days to 1st Service	63	254	106	56	
Days Open	204	181	193	226	
Projected Calving Interval	15.9	15.1	15.5	16.6	
Guernsey					
Rolling Herd Average	16,724	15,867	13,667	12,346	
Summit Milk Yield 1st	55.0	57.5	48.0	45.5	
Summit Milk Yield 2nd	68.0	68.0	55.5	55.5	
Summit Milk Yield 3rd	72.0	65.0	64.0	56.5	
Summit Milk Yield Avg.	65.0	63.0	57.0	52.5	
Income/Feed Cost	1,383	1,280	1,257	751	
SCC Average	66.0	249	278	212	
Days to 1st Service	80.0	109.5	89.0	116.5	
Days Open	175	183.5	178	201	
Projected Calving Interval	15.0	15.2	15.0	15.8	
Holstein					
Rolling Herd Average	23,401	20,271	18,092	14,645	
Summit Milk Yield 1st	74.2	6603	61.0	51.6	
Summit Milk Yield 2nd	93.5	83.2	75.4	63.4	
Summit Milk Yield 3rd	99.0	88.4	80.6	69.1	
Summit Milk Yield Avg.	87.4	79.0	73.1	63.0	
Income/Feed Cost	1,757	1,457	1,255	979	
SCC Average	349	360	388	479	
Days to 1st Service	90	91	91	86	
Days Open	166	167	177	199	
Projected Calving Interval	14.6	14.7	15.0	15.7	
Jersey					
Rolling Herd Average	17,743	15,187	13,653	11,346	
Summit Milk Yield 1st	56.1	51.7	44.6	41.6	
Summit Milk Yield 2nd	57.4	57.8	56.8	49.4	
Summit Milk Yield 3rd	74.8	59.6	58.1	52.1	
Summit Milk Yield Avg.	65.7	59.2	53.6	48.3	
Income/Feed Cost	1,646	1,411	1,266	802	
SCC Average	299	311	274	441	
Days to 1st Service	103	80	85	102	
Days Open	141	149	130	152	
Projected Calving Interval	13.8	14.1	13.5	14.2	
Milking Shorthorn					
Rolling Herd Average	18,194	15,166	14,667	10,713	
Summit Milk Yield 1st	54.0	51.5	58.0	19.5	
Summit Milk Yield 2nd	83.0	68.0	72.0	49.0	
Summit Milk Yield 3rd	90.0	74.0	80.0	57.0	
Summit Milk Yield Avg.	81.0	62.0	72.0	53.0	
Income/Feed Cost	—	1,240	1,089	637	
SCC Average	100	272	189	268	
Days to 1st Service	0	90	0	58	
Days Open	137	138	300	122	
Projected Calving Interval	13.7	13.7	19.1	13.2	

Hay Prices*—Kansas

	Location	Quality	Price ($/ton)
Alfalfa	Southwestern Kansas	Supreme	100-115
Alfalfa	Southwestern Kansas	Premium	100
Alfalfa	Southwestern Kansas	Good	85-100
Alfalfa	South Central Kansas	Supreme	90-110
Alfalfa	South Central Kansas	Premium	90-100
Alfalfa	South Central Kansas	Good	80-90
Alfalfa	Southeastern Kansas	Supreme	—
Alfalfa	Southeastern Kansas	Premium	90-100
Alfalfa	Southeastern Kansas	Good	—
Alfalfa	Northwestern Kansas	Supreme	90-105
Alfalfa	Northwestern Kansas	Premium	85-100
Alfalfa	Northwestern Kansas	Good	70-85
Alfalfa	North Central Kansas	Supreme	50-55cents/pt
Alfalfa	North Central Kansas	Premium	85-105
Alfalfa	North Central Kansas	Good	70-80

Supreme = over 180 RFV (less than 27 ADF)
Premium = 150–180 RFV (27–30 ADF)
Good = 125–150 RFV (30–32 ADF)

Source: USDA Kansas Hay Market Report, *October 27, 2000*

Hay Prices—Oklahoma

	Location	Quality	Price ($/ton)
Alfalfa	Central/Western, OK	Premium	85-100
Alfalfa	Central/Western, OK	Good	70-90
Alfalfa	Panhandle, OK	Premium	85-95
Alfalfa	Panhandle, OK	Good	70-90

Source: Oklahoma Department of Agriculture, *October 26, 2000*

Feed Stuffs Prices

	Location	Price ($/ton)
Blood Meal	Texas Panhandle	375-385
Corn Gluten Feed	Kansas City	55-60
Corn Gluten Meal	Kansas City	250-255
Corn Hominy	Kansas City	59-60
Cotton Seed Meal	Kansas City	170-175
Whole Cotton Seed	Memphis	116
Distillers Grains	Central Illinois	73-76
Pork—Meat and Bone Meal	Texas Panhandle	175-182
SBM 48%	Kansas City	172-179
Sunflower Meal		85
Wheat Middlings	Kansas City	49-52

Source: USDA Feedstuff Market Review, *October 25, 2000*

Revised dairy cattle nutrient requirements subject of Jan. 16-17 K-State workshop

A workshop to introduce revised nutrient requirements of dairy cattle is scheduled for Jan. 16-17 in Manhattan.

The workshop is based on a new publication that contains many changes and more than 400 pages of material. Participants will hear from the authors via satellite and have a chance to work with new software included in the 2000 edition.

Cost is $99. This includes a copy of the revised nutrient requirements, new software, two lunches and one dinner. Registration deadline is Monday, Jan. 8. For more information contact Mike Brouk at (785) 532-1207.

Continued from page 1

problem and require identification and corrective action. The first step is to identify the types of organisms that are contributing to elevated SCC levels. Samples of the bulk tank milk should be cultured to identify whole-herd problems.

Samples should be taken from the bulk tank five days in a row or from five milk pickups. Take samples from the top of the tank after the milk has been agitated for 15 minutes. Make every effort to prevent contamination of the sample during this process. Remember that bacteria are everywhere. Hands, sampling tools and nonsterile vials may carry contamination. In addition, sampling from the bottom of the tank may cause contamination from the valve port.

Use a clean dipper or sterile syringe to remove a sample, and transfer it to a sterile milk sample vial. Fill the vial half full, seal it with the cap and immediately place it in the freezer. Freezing the sample immediately stops bacterial growth and provides the laboratory with a sample that accurately represents the true bacteria population of the bulk tank. Allowing the sample to sit in a warm room even for a short period of time will allow bacteria to grow and multiply. Since different bacteria grow at different rates under different conditions, allowing growth to occur in the sample leads to erroneous results. Once all five samples have been collected and frozen, ship them to the laboratory in an insulated container with frozen ice packs. It is important to ship the samples so they arrive at the laboratory frozen or cold. Discuss shipping method and arrange testing date with the lab ahead of time. The laboratory should return bulk tank culture results to the farm or herd veterinarian in a few days.

How Can I Solve Mastitis Problems?

Bulk tank cultures will reveal whether the problem is environmental, contagious or a combination. As the table indicates, environmental problems are best corrected with proper cow management. Milking clean, dry udders and using correctly adjusted equipment with proper milking procedures will reduce many of the environmental pathogens and, as a result, environmental mastitis.

Table 1. Estimated differences in lactation milk yield associated with increased SCC score.

Lactation Average		Difference in Milk Yield[1]	
		Lactation 1	Lactation ≥2
Linear SCC Score	SCC (1000s/ml)	(lbs/305 days)	
0	12.5	---	---
1	25	---	---
2	50	---	---
3	100	–200	–400
4	200	–400	–800
5	400	–600	–1,200
6	800	–800	–1,600
7	1600	–1,000	–2,000

[1]Comparisons are with lactation yield as a SCC score of 2.
Source: National Mastitis Council

Housing is the other major concern with environmental mastitis. Cows need a clean, dry resting area. Bacteria require food, warmth and a moist environment. Removing any of the three reduces bacterial growth. Correction of housing deficiencies and the use of dry-cow treatments at dryoff provides the best protection. Remember that the cow is most likely to develop a new mastitis infection the first and last two weeks of the dry period. So the housing environment during the dry period is critical to effective mastitis control.

Finding contagious organisms in the bulk tank cultures calls for a different approach. Since contagious mastitis is spread at milking, it is important to identify the infected animals and segregate them to prevent the spread of the organisms to additional cows. The only way to positively identify infected cattle is through individual cow milk cultures. This requires taking a milk sample from the cow using sterile sampling techniques and submitting it for evaluation.

As with the bulk tank samples, it is important not to contaminate samples in the process. Bacteria are everywhere. They cling to udder hair and skin, milkers' hands and on every surface in the milking parlor. Wear gloves, and take samples before milking. Clean and dry udders first, and scrub each teat end with alcohol. Discard one squirt of milk before sampling, and collect equal amounts from each teat if sampling all quarters. Fill vials half full, and freeze or place them on ice immediately. Remember that bacteria grow well in warm, moist environments containing food, so warm milk is an excellent medium for bacterial growth. Leaving samples to sit in the warm milking parlor for several hours until milking is complete may lead to erroneous results, and contagious animals may be missed. It is unusual for a single quarter to be infected with more than one organism. If individual cow milk samples show two or more organisms, contamination is likely.

Individual cow milk samples are used to identify the cows infected with contagious mastitis. Once these cows are identified they should be culled or segregated into a separate group and milked last. The contagious pathogens are generally resistant to antibiotics, so once infected, the animal will likely become a carrier. Separation from clean cows will minimize the risk to other animals. Dry treatments are also usually not effective on these organisms, and if the animal remains on the farm for another lactation, it should be considered infected with a contagious pathogen. Permanent visual identification may be helpful.

Constant Attention to Detail

Once the problems have been identified and the control plan developed, implement it immediately. This requires teamwork and a commitment to following the plan to the exact detail. A monitoring system using DHIA, bulk tank SCC, bulk tank cultures and individual cow milk samples at freshening will ensure that problems are detected early and corrected.

When purchasing cattle, all lactating cattle should be cultured before entering the general herd. Dry animals should be cultured upon freshening. Allowing in one contagious carrier could result in culling a high percentage of the herd. Effective mastitis control programs are based on prevention—not just correcting problems. This requires constant attention to detail by the dairy and evaluation on a continual basis.

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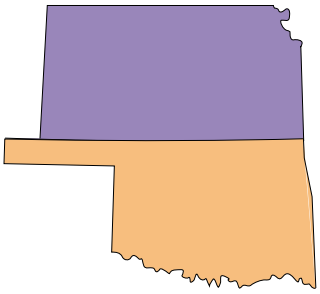

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