

November 2001

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Mastitis in Heifers (Part 2)

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Influence of Dietary Supplementation

Another management tool to reduce the level of infection and SCC when heifers calve as well as throughout lactation is through dietary supplementation with micronutrients. Diet appears to play a role in udder resistance to infection because certain nutrients affect various mammary resistance mechanisms. In one study, heifers received selenium (0.3 ppm/day) and vitamin E (50 to 100 ppm/day) supplementation starting 60 days prepartum. A selenium booster injection (50 mg) was administered 21 days prior to freshening, and the dietary supplementation was continued throughout lactation. Dietary supplementation reduced staphylococcal and coliform infections at calving by 42%. Although rate of new infection during lactation did not differ from unsupplemented controls, duration of infection caused by organisms other than *Corynebacterium bovis* was reduced 40% to 50% in supplemented heifers. Clinical mastitis in supplemented heifers was reduced (57%) in early lactation as well as throughout lactation (32%), and mean SCC was lower. Thus, vitamin E and selenium improved udder health of heifers, and the effect of dietary supplementation was most evident at calving and in early lactation.

Role of Vaccination in Mastitis Control

Recent research has demonstrated that several experimental *Staph. aureus* vaccines as well as one commercial vaccine can effectively increase antistaphylococcal anti-

body titers and reduce the new intramammary infection rate in heifers.

In recent studies showing success of vaccines in heifers, researchers in Louisiana evaluated a commercially available *Staph. aureus* vaccine in young dairy animals. The vaccine (Lysigin®) was a lysed culture of polyvalent somatic antigens in aluminum hydroxide. At 6 months of age, heifers were vaccinated using a 5-ml dose im., and 14 days later, vaccinates received a booster dose, which was repeated at 6-month intervals. Results demonstrated that the number of quarters exhibiting chronic IMI during pregnancy was reduced 43.1% in vaccinates compared with controls, rate of new IMI during pregnancy was reduced 44.8%, and rate of new IMI at freshening was reduced 44.7%.

Other Factors to Consider

Breed. In other investigations of mastitis in heifers, additional parameters have been evaluated. For example, the overall prevalence of infection was found to be approximately twice as high in Jerseys (67.7%) compared with Holsteins (35%).

Flies. Heifers with scabs and abrasions on the teat skin surface, presumably induced by flies, had a higher frequency of infection (70%) than heifers with normal teats (40%). Moreover, herds using some form of fly control had markedly fewer infections with environmental streptococci and *Staph. aureus* and somewhat fewer coagulase-negative staphylococcal infections than those without fly control.

Insecticide-impregnated tail tags have been developed in attempts to control flies as well as mastitis in dairy heifers. In North Carolina, heifers reaching puberty in the summer months were fitted with tags, and

the presence or absence of abnormal milk was noted at calving. Results indicated a beneficial effect of this control measure. A subsequent study using beef animals conducted during the spring and summer in Louisiana demonstrated that the same tail tags were successful in reducing fly populations (60% decrease) and the incidence of new intramammary infections during the first 2 months after placement, but thereafter, there was little control of either parameter. In animals with tags, the incidence increased from 8.6 to 15% over 2 months, while in controls, incidence increased from 17.2 to 52.4%.

Clinical Mastitis. In examination of the frequency of clinical mastitis during pregnancy among bred heifers in four commercial dairies revealed a level of 7.5%. At the time of calving, frequency of clinical cases increased to 24%, indicating that either the presence of new infections during the prepartum period led to flare-ups of clinical mastitis at freshening or that chronically infected quarters in heifers should be controlled prepartum rather than at or following freshening.

Secretion characteristics. The monitoring of mammary secretion characteristics demonstrated that quarters with honey-like consistency exhibited low frequencies of infection (10%), whereas those with a thin, watery secretion with clots and flakes exhibited a high frequency of infection (78%).

Season. The effect of season on prevalence of infected quarters in breeding age heifers demonstrated that level of infection decreased through winter (55.6%), spring (42.3%), and summer (30.3%) and increased in the fall (49.6%). This trend is just the opposite of what was expected in view of the association of mastitis and the fly season in this region. However, at time of calving, prevalence of infection increased from winter (44.8%) to spring (49.6%) and summer (60.5%), and decreased in the fall (35.9%).

Sources of Infection

How do heifers get intramammary infections? No one knows for sure. Sources may include 1) bacteria that are the normal flora on udder skin that are in an opportunistic position to colonize the teat end and enter the teat orifice; 2) bacteria harbored in the oral cavities of calves, which suckle other calves; 3) bacteria present in the heifers' environment, such as those found in soil, manure, and bedding materials; and 4) bacteria present on biting flies that congregate on teat ends. Normal flora would be almost impossible to control, as these microorganisms are naturally found on the udders and teat skin. Perhaps daily teat dipping would reduce bacterial populations, but this practice would be highly impractical. The transfer of mastitis-causing bacteria through cross-suckling of calves fed mastitis milk can be

prevented by housing calves in individual hutches, and this management practice has become fairly routine. As with attempt to control normal udder flora, the control of environmental mastitis-causing bacteria has its limitations; however, the percentage of intramammary infections caused by the environmental streptococci and coliforms is low. Flies have certainly been implicated in the etiology of heifer mastitis. The horn fly (*Haematobia irritans*) has been found feeding on scabs and abscesses infected with *Staph. aureus* and has been shown to spread mastitis-causing bacteria among heifers.

Summary

Currently, there are not established management practices to prevent young dairy heifers from contracting intramammary infections, other than use of individual calf hutches to prevent cross-suckling. As stated above, whether such infections are caused by flies, bacteria in the environment, or natural oral and udder skin flora remains to be proven. However, once an intramammary infection is diagnosed, the use of nonlactating cow therapy has proven highly effective in curing this disease. The dairyman has the responsibility of ensuring that an animal remains healthy in his care, then this responsibility should include udder health. It is his responsibility to culture any new animals that are brought into his herd to avoid the introduction of contagious mastitis-causing microorganisms such as *Staph. aureus*. Some dairymen and veterinarians worry that sampling heifers for presence of mastitis may destroy the keratin plug, leading to new infections. However, studies designed to test this theory demonstrated that as long as teat ends were properly sanitized, samples were taken aseptically, and teats were dipped in a barrier type product after sample collection, there was not an effect on new infection rate.

Whether heifers are raised on the dairy or custom grown, managers of these young dairy animals should be vigilant of udder health. Visual and manual examination of the developing udders, mammary fluid, and teat skin will help identify swollen quarters, abnormal secretions, and presence of teat scabs. Individual swollen quarters with abnormal secretions (clots and flakes) and those with teats exhibiting scabs and abrasion are most likely infected and should be treated. It is suggested that nonlactating cow therapy of heifers be carried out if greater than 5% of animals are freshening with *Staph. aureus* mastitis. Managers should be cautioned, however, that treatment of bred heifers may constitute extra-label drug used and should be carried out under the supervision of the herd veterinarian within of the herd within the context of a valid veterinary/client/patient relationship.

[For copies of the full-length original "Mastitis in Heifers" article contact MSU Dairy Extension at 662-325-2851]

OCTOBER 2001 HONOR ROLL**

DAIRY	COUNTY	NO. COWS	LBS. ECM	Rolling Herd Average			DOT	Supervisor
				MILK	FAT	PROT		
Freeman Dairy	Pike	141	58.2	20646	716	645	10/26	A. Wilson
Ronald H Clark	Lincoln	83	57	21446	803	658	10/29	D. Patterson
Neal And Tina Smith	Noxubee	142	53.8	0	0	0	10/15	B. King
David Robinson & Sons	Rankin	130	53.7	23361	858	684	10/17	D. Patterson
Ray Gallop And Sons	Monroe	75	53.6	18461	636	583	10/23	B. King
Cal Maine Foods Dairy	Hinds	1361	50.4	19627	756	610	10/13	R. Hardin
Coastal Plain Exp Sta	Newton	173	50.2	21952	816	656	10/14	J. Coker
A L Boyd Jr	Walthall	78	50	20539	618	608	10/10	R. Vandewephe
Rowzee Jersey Farm	Newton	177	49	16526	762	611	10/15	J. Coker
Melvin Nicholson	Newton	112	48.4	20954	778	647	09/30	J. Coker
Dixie Dairy Sales	Carroll	499	48.1	21284	963	625	10/16	R. Hardin
J & L Dairy	Walthall	208	47	18489	708	559	10/29	R. Vandewephe
Knights Dairy Farm	Jones	115	44.5	20882	709	644	10/02	J. Wilson
Cheeks Dairy	Jones	130	43	18446	578	575	10/24	J. Wilson
Max Lawson	Amite	191	42.1	15038	542	471	10/17	R. Reid
Paul W Edwards	Newton	133	41.7	18764	760	581	10/03	J. Coker
Pat Ard	Lincoln	181	40.9	16532	623	529	10/22	D. Patterson
Eddie Forbes	Marion	169	40.8	0	0	0	10/24	A. Wilson
Buford Pigott And Son	Walthall	159	40.7	15445	619	498	10/26	K. Russell
Gurney's Dairy Farm	Amite	202	40	16055	586	471	10/10	R. Reid
John T McReynolds	Oktibbeha	110	39.9	16086	582	483	10/16	B. King
Eddie Forbes	Marion	161	39.6	0	0	0	09/29	A. Wilson
Thompson Brothers	Marshall	118	39.1	19131	729	584	10/15	R. Hardin
Jerry Sisco	Lincoln	105	38.6	0	0	0	10/15	D. Patterson
North MS BR Exp Sta	Marshall	113	38.6	18414	674	579	10/08	J. Jumper

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).

Honor Roll Correction.....

Due to a mistake, two producers were left off the September 2001 Honor Roll. These producers were: Wayne Jacobsen of Pike County with 121 cows, 42.8 lbs. ECM, and 17,232 RHA milk and Kenny Mauthe with 60 cows and 37 lbs. ECM.

signed to determine the effects of this type of cooling on production, reproduction, and management, and the economic feasibility of this type of cooling system.

New Tunnel Ventilation Barn

In June 2001 the new tunnel ventilation free stall facility at the North Mississippi Branch Experiment Station, Holly Springs was completed. The facility is a 90 ft. x 30 ft. housing unit, outfitted with 50 ft. (25 ft. on each side of the unit) of cooling cells and four 47 inch, 1 HP fans for pulling air originating at the cooling cells through the facility. The barn will house a maximum of 20 mature Holstein cows and is self-contained with feed bunk and water troughs along one side and twenty free-stalls bedded with sand on the other. Additionally, the unit has controlled lighting and flush tanks for waste management. Several research projects have been de-

Upcoming Events

- February 2 Dixie Junior Round-Up Dairy Show, Jackson, MS
- February 4-5 Southern Dairy Conference, Atlanta, GA
- February 11 Mississippi DHIA and Mississippi ADA Annual Meeting, Ramada Inn Southwest, Jackson, MS
10:00 a.m.
- February 11 Mississippi Farm Bureau Winter Commodity Conference, Ramada Inn Southwest, Jackson, MS

December Advanced Class I Milk Plunges by \$3.78 Cents to \$15.08/cwt.

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Dairy Economist, MSU

Dairy farmers are now realizing the brunt of the sharp declines in butter and cheese prices that plagued the industry during the months of September and early October. Analysts identified weakening demand for butter and cheeses related to the September 11th attacks as the primary cause of these prices. Travel dropped off, as did customer volumes at restaurants. As a result, institutional cheese and butter sales plunged, which forced dairy product prices down by 35-45% since late August. These plunging product prices were fueled, almost exclusively, by consumer demand reactions to the terrorist acts in spite of sagging milk supplies. National milk production declined again in October based solely on the fact that the numbers of cows on U.S. dairies have decreased by 146,000 compared to the same month of 2000. Despite these plunging prices, the good news is that most dairy analysts that dairy product prices have already reached their lowest level for 2001 and that milk prices should stabilize during the first quarter of 2002 and increase slightly as next summer approaches. Demand for butter and cheeses usually increase during the weeks leading up to the Thanksgiving and Christmas holidays and reach their peak during Super Bowl weekend. However, drastic declines in dairy product consumption normally occurs during late winter and spring unfortunately, just as milk production expands during the "spring flush."

For December, the Class IV skim milk price was the Class I mover price because it was greater than the corresponding Class III prices. The USDA reported that the December 2001 Advanced Class III Skim Milk price was \$6.32 per hundredweight (cwt.) compared to the Advanced Class IV Skim Milk price of \$7.15/cwt. The difference between these respective Class III and Class IV prices resulted in a \$0.80 / cwt. higher Class I base price (\$11.18 vs. \$11.98). The USDA announced on November 23 that the December 2001 Advanced Class I "base" milk price would be \$11.98 per cwt. (for 3.5% butterfat milk). After adding the \$3.10 Class I price differential for the pricing zone which includes Atlanta and Starkville (Oktibbeha County) to this "base" price, the Advanced Class I milk price for November will be \$15.08 per cwt. The December Advanced Class I price (for the North Central Zone) and represents a substantial DECREASE of \$3.78 per cwt. BELOW the corresponding November price of \$18.86. This year's December Advanced Class I price is 15 cents LESS than the December 2000 Class I price of \$15.23 per cwt. Dairy producers need to remember that the December Class I price will be an important, but not the only, factor

influencing revenues derived from the sale of their milk produced during the month of December.

Market Conditions. Many dairy farmers are expressing dismay and confusion about why milk and dairy product prices have fallen so sharply since September. Their concerns are based on the fact that these plunging prices occurred despite declining milk production during a period of the year when dairy demand peaks due to the Thanksgiving and Christmas holidays. Thus, milk producers question how milk prices could fall by more than 20% when milk supplies are decreasing and dairy product demand is increasing. Market analysts attempt to describe this recent price plunge as being caused by two important factors that affected dairy demand, dramatically. First, the U.S. economy has suffered a downturn and a group of economists have officially declared that we have been in a recession since Spring of 2001. Second, the September 11 terrorist attacks exasperated the situation and sent shock waves through our nation, which radically changed travel habits. These two factors lead to a 17% decrease in U.S. cheese sales during the month of October. So, declining demand caused this plummeting of milk and dairy prices.

Milk output per cow has begun to increase with the onset of cooler temperatures this fall but a sharp drop in the number of cows in the national herd has overwhelmed all of this boost in per cow productivity. National milk production in October fell 0.3% compared to 2000. Despite reduced milk output, very little milk is being imported in the Southeast to meet bottling needs. During the third week of November, Florida bottlers imported only 4 loads into the state. Southeast milk handlers imported 14 loads from the Mid-Atlantic region during this the same week.

There is some good news in this bleak picture: Butter and cheese prices have stabilized and improved slightly during mid-November. The industry feels that the market overreacted to the declining demand and prices sank too far in relation to the demand-supply situation. The USDA's October 30 Cold Storage report shows that inventories of butter fell 10% between September and October but were 63% greater than October 2000. Commercial holdings of various types of natural cheeses were 5-20% of the September totals and ranged between 32% less and 40% more than last October totals. The market tone for dairy products is mixed. Butter markets are described as "unsettled" versus the "firm" tone of cheese markets. But, the current price outlook is "weak" due to a seasonal decline in dairy product demand that usually occurs in late January (after the Super Bowl). During late-November, Class III futures contracts settlement prices remained below \$12.00/cwt. for all contract months between

December and March. Grade AA butter futures contracts were being traded at \$1.29/lb. for the December contract and near \$1.38 and \$1.43 for the March and May 2002 contracts, respectively. Thus, it is expected that these factors should stabilize Class I milk prices (Atlanta/Starkville zone) near the current level and be reported near \$15.00/cwt. for January with a possible slight increase in milk prices forecast (increase only 20-25 cents/cwt.) in the first quarter of 2002.

Milk Production. The reduction in the cow numbers in the national herd is continuing to overwhelm recent increases in output per cow. As a result, U.S. milk production continues to be sluggish despite cooler weather and an easing of drought conditions in some areas of the country. Dairy farmers are still looking for cows to place in their herds and have paid close to \$2,000 per head for high quality animals. Revised USDA statistics indicated that September milk production was down 0.7% compared to September 2000 as farmers milked 151,000 fewer cows and receiving 14 more pounds per cow. Similarly, the comparable October data show that milk output fell only 0.3% while milking 146,000 fewer cows produced 20 more pounds per cow. Reviewing October statistics for the 20 selected states, the USDA reported that the amount of milk produced declined in 13 of the 20 states while the other 7 states recorded increased or level output. States reporting reduced production were: Missouri (-14.5%), Texas (-11.1%), Illinois (-5.4%), Iowa (-4.7%), Kentucky (-4.4%), and Wisconsin (-4.1%). All southeastern states also recorded shrinking output (Florida, -1.7%; and Virginia, -0.7%). Western states and Indiana have dramatic increases in milk output. The October 2000-October 2001 statistics indicate that the states with the greatest increases in milk output were: New Mexico (+8.4%), Indiana (+7.5%), Idaho (+6.5%), California (+5.1%) and Arizona (+3.5%). The milk-feed price ratio for October was 3.69 (3.12 in October 2000) decreasing from 3.76 in September. So, the relative "high" price of whole milk compared to the "low" price for 16% mixed dairy feed have supported actions by farmers to increase output and justified paying more for dairy replacement heifers and cows.

Dairy Product Prices. Dairy product prices stabilized and increased slightly during November. A review of Chicago Mercantile Exchange (CME) cheese markets finds that 40# block prices were reported at \$1.20 on October 19 have increased to \$1.33 on November 30 -- a 13.75-cent rise. Barrel cheddar prices have undergone a similar experience during this period where the CME reported a cash price for 500# barrel cheddar cheese of \$1.17/lb. on October 19 compared to \$1.29 on November 30 -- a 12-cent (+10.3%) increase. Many processors feel that the crash in prices went "too far" and correction was

needed in cheese prices. But, processors have not bid up prices for Class II cream and this price has remained near \$1.80/lb. level since mid-October. On October 19, the Grade AA butter price was \$1.25/lb. compared to \$1.30 on November 30 -- an increase of 5.50 cents/lb. Nonfat dry milk prices (NDM) continue to remain stable at \$1.00/lb. Export demand and funding provided for the Dairy Export Incentive Program (DEIP) various dairy products have propped up NDM prices well above the revised support level. Despite these NDM market prices, the USDA (CCC) has begun to make weekly purchases of non-fortified NDM during November. These purchases were from western NDM processors who have offered 4-20 million pounds of NDM to the CCC during late-October and November. NDM cash prices have ranged from 90-94.5 cents in the West to \$0.99 to \$1.02/lb. in the Southeast and Northeast. CCC purchases have totaled almost 42.8 million pounds since last October 1.

Near-term Market Outlook. The dairy market is plagued by concerns of declining demand and increasing production expected during the first quarter of 2002. Certainly, worries about an economic recession, unemployment, ebbing consumer confidence, and diminishing dairy product consumption have caused sharp declines in dairy and milk prices. Current demand-supply outlook has industry experts anticipating that dairy and milk prices will "calm down" and could increase, slightly. As of late November, Class I milk prices are expected to decline by as much as \$0.50 to \$1.00 for early 2002. The price outlook for 2002 is expected to be "worse" than 2001 (down about \$1.50/cwt.) but "better" than 2000 (up \$1.20/cwt.). Thus, the January Advanced Class I milk price for Mississippi (Starkville zone) expected to be in the range of \$14.75-\$15.00. Additionally, the November Class III price is expected to decrease sharply by \$3.00-\$3.50 and should be reported near \$11.30 with the December and January 2002 Class III prices predicted to be near \$12.00/cwt. The CME reported on November 30 that Class III (Class IV,) futures contracts settlement prices were \$11.90 (\$11.95) for December, \$11.80 (\$12.05) for January, \$11.80 (\$12.05) for February, and \$11.90 (\$12.05) for the March 2002 contract.

Southeast F.O. #7 "Blend" Price Falls to \$16.70 per cwt. in October. The Southeast Federal Order Milk Market Administrator reported the October 2001 "blend" or uniform price for milk delivered in the Atlanta and Starkville "base" zone of Federal Order (FO) #7 was \$16.70/cwt. for 3.5% butterfat milk. The North Zone is -\$0.20, North Central Zone is the "base" zone, South Central Zone is +\$0.20, South Zone 10 is +\$0.30, and Coastal Zone is +\$0.40/cwt.) The October blend price of

\$16.70 for the base zone of FO #7 represents a DECREASE of \$1.39/cwt. compared to September (\$18.09). The October 2001 blend price was \$2.81/cwt. ABOVE October 2000 (\$13.89). Average butterfat test and the butterfat prices in the four milk class categories have a direct impact on the value of milk pooled in FO#7 and the amount of milk revenues available to be distributed to dairy farmers. For October, the respective butterfat prices and the average butterfat tests for each milk class were: Class I, \$2.52/lb. and 2.18%; Class II, \$1.66/lb. and 7.71%; Class III, \$1.65/ lb. and 4.36%; and , Class IV, \$1.65/lb. and 8.98%. Factoring the average butterfat test with the pounds of 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 October blend price of \$16.70/cwt. was determined using the following factors: (1) a “net” Class I price of \$15.;68 on 66.19% of the milk marketed; (2) the “net” Class IV price of \$29.68 on 4.83% of the milk marketed. Please remember that milk is priced based on the location of the plant that processes the farmer’s milk.

Uniform or "Blend" Price For November 2001

North Zone:	\$16.50
North Central Zone:	\$16.70
South Central Zone:	\$16.90
South Zone:	\$17.00
Coastal Zone:	\$17.10

Prices of Holstein Dairy Cattle Replacements

<u>Location of Sale</u>	Blansit, MO	Thomasville, GA
<u>Auction Date</u>	November 27	November 26
<u>No. of Head Sold</u>	1,377	337
<u>Springer Heifers</u>		
Supreme	\$1,800-\$1,950	\$1,780-\$1,790
Approved	\$1,550-\$1,800	\$1,510-\$1,750
Common	\$1,000-\$1,185	\$680-\$1,180
<u>Springer Cows</u>		
Supreme	\$1,490-\$1,640	Not Available
Approved	\$1,300-\$1,400	\$1,160-\$1,200
Common	\$1,000-\$1,100	\$650-\$780
<u>Fresh Heifers/Cows</u>		
Supreme	\$1,600-\$1,700	\$1,770-\$1,980
Approved	\$1,325-\$1,550	\$1,530-\$1,750
Common	\$770-\$850	\$660-\$1,035
<u>Calves 1-7 Days Old</u>		
Holstein Heifers	\$210-\$490	Not Available
Holstein Bulls	\$55-\$95	Not Available
Combined	Not Available	\$50-\$350

Class I Price For December 2001 (Advanced Price)

North Zone:	\$14.88
North Central Zone:	\$15.08
South Central Zone:	\$15.28
South Zone:	\$15.38
Coastal Zone:	\$15.48

