July/August 2001

# Dairy Lines

Volume 7, Number 7

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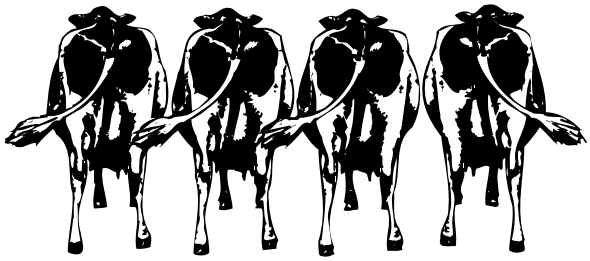


**DAIRY RESEARCH & EXTENSION NEWS**

http://www.oznet.ksu.edu/ansi/nletter/dairylin.htm

# Current Research Topics

## Effects of presynchronization and bovine somatotropin (bST) on pregnancy rates to a timed artificial insemination protocol in lactating dairy cows

F. Moreira, C. Orlandi, C.C. Risco, R. Mattos, F. Lopes and W.W. Thatcher, J. Dairy Sci. 84:1646

The objectives of this experiment were: 1) to replicate a previous observation that bST increases pregnancy rates to the timed artificial insemination protocol, 2) to determine whether bST increases pregnancy rates through its effects before or after timed insemination, and 3) to compare pregnancy rates of cows that initiate the timed artificial insemination protocol at random stages of the cycle to cows that initiate the timed artificial insemination protocol at a targeted stage of the estrous cycle.

Lactating Holstein cows (543 head) were randomly assigned to receive a presynchronization treatment or not, and were treated with bST (500 milligrams) at 63±3, 73±3 or 147±3 days postpartum. The latter group was used as a control. Presynchronization treatment consisted of two injections of $PGF_2$ (25 milligrams) given 14 days apart, with the second injection of $PGF_2$ being administered 12 days before initiation of the timed A.I protocol. All cows received GnRH (100 micrograms) at 63±3 days postpartum, an injection of $PGF_2$ (40 milligrams) 7 days later, a GnRH injection at 48 hours after $PGF_2$, and were inseminated 16 to 20 hours later. Cows were resynchronized if determined to be nonpregnant by ultrasound at 32 days after insemination with a GnRH injection (100 micrograms), an injection of $PGF_2$ (40 milligrams) 7 days later, and a GnRH injection at 48 hours after $PGF_2$ and were inseminated 16 to 20 hours later. Cows were examined for pregnancy at 32 days and reexamined at 74 days after insemination. No differences in pregnancy rates were observed between cows receiving bST treatment at 63 or 73 days postpartum.

An interaction between presynchronization and bST treatment indicated that pregnancy rates were increased for cows treated with bST when cows were presynchronized. When anestrous (non cycling) cows were excluded from the analysis, both an effect of bST and presynchronization were observed, indicating that bST increased pregnancy rates regardless of presynchronization treatment and that presynchronization also increased pregnancy rates independent of bST treatment.

Researchers concluded that both presynchronization and bST successfully increased pregnancy rates to first-service timed artificial insemination. There were no indications that bST may reduce fertility of lactating cows submitted to a timed artificial insemination protocol that eliminates estrus detection. Further, administration of bST at initiation of the timed A.I protocol or at insemination was equally beneficial to pregnancy rates.

## Prevalence of mastitis in dairy heifers and effectiveness of antibiotic therapy

W.E. Owens, S.C. Nickerson, R.L. Boddie, G.M. Tomita and C.H. Ray, J. Dairy Sci. 84:814

It is known that dairy heifers are at risk for developing mastitis in early life, even before attaining breeding age. Studies have documented mastitis in heifers as young as 9 months of age, and investigations have shown infection rates can be as high as 97 percent.

While studies employing antibiotic preparations administered prior to calving have reported excellent cure rates, no consensus has been drawn as to the time of treatment or which type of antibiotic is best. To answer these questions, four antibiotic preparations were tested during the first (0 to 90 days), second (90 to 180 days), and third (180 to 270 days) trimester of pregnancy to determine which antibiotic and which treatment time was best.

Two hundred thirty-three dairy heifers were randomly assigned to receive one of four different antibiotics during the first, second, or third trimester of pregnancy. At the initial sampling prior to treatment, 56 percent of quarters were infected with some type of organism, and 15.4 percent of quarters were infected with *Staphylococcus aureus*. Treatments included 1) untreated controls, 2) a nonlactating cow product containing cephapirin benzathine (Tomorrow, Fort Dodge Animal Health, Fort Dodge, IA), 3) a nonlactating cow product containing penicillin and streptomycin (Quartermaster, Pharmacia Upjohn, Kalamazoo, MI), 4) a nonlactating cow product containing penicillin and novobiocin (Albadry Plus, Pharmacia Upjohn, Kalamazoo, MI), and 5) an experimental product containing tilmicosin (Micotil, Eli Lilly and Co., Indianapolis, IN). *Caution: Micotil is not labeled for use as an intramammary infusion product.*

Cure rates for the four antibiotic products indicated that all were equally effective against *Staphylococcus aureus* and all were significantly more effective than the spontaneous cure rate observed in untreated control quarters. No differences in efficacy were observed due to the different prepartum treatment times. However, fewer new *Staphylococcus aureus* infections occurred after treatment in the group treated during the third trimester of pregnancy; therefore, treatment during the third trimester will reduce the chances of new infections occurring after prepartum treatment.

From this study it can be concluded that treatment of heifers known to be at risk for developing *Staphylococcus aureus* mastitis is advantageous. Treatment with an *approved* dry cow intramammary infusion product at approximately 60 to 45 days prepartum should allow sufficient time for residues to dissipate before calving and ensure that maximum numbers of infections are treated.

## Influence of subclinical mastitis during early lactation on reproductive parameters

F.N. Schrick, M.E. Hockett, A.M. Saxton, M.J. Lewis, H.H. Dowlen and S.P. Oliver, J. Dairy Sci. 84:1407

Researchers have demonstrated that the onset of clinical (visible) mastitis before first service is detrimental to reproductive performance in lactating dairy cattle. However, little is known about the effects of subclinical mastitis during this time. Therefore, the objective of this study was to determine the effects of clinical and subclinical mastitis on reproductive performance during early lactation.

From 1986 to 1997, quarter foremilk samples were collected every 4 to 8 weeks during lactation, at drying off, near calving and when clinical mastitis was diagnosed and were cultured to identify causative bacteria. Service per conception, days open and days to first service were obtained from DHIA records on 752 cows. Cows were first separated by mastitis type (clinical = 186 head, subclinical = 240 head, control, uninfected or infected after confirmed pregnancy = 326 head). Subclinical mastitis was defined as the presence of the same pathogen in at least two consecutive samples during lactation. Cows were further reclassified based on the time of clinical or subclinical mastitis as follows: period 1, before first service (374 head), period 2, between first insemination and pregnancy (52 head) and period 3, after pregnancy or uninfected (326 head).

Milk production did not differ for any group separations. Cows with clinical or subclinical mastitis before first service had increased days to first service (77.3 and 74.8 days), days open (110.0 and 107.7 days) and services per conception (2.1 and 2.1) compared with controls (67.8 days, 85.4 days and 1.6). Days to first service were not increased in cows with clinical or subclinical mastitis during period 2 (70.6 and 61.2 days). However, days open (143.6 days) and services per conception (3.0) were increased in cows with clinical mastitis during period 2, but not in cows with subclinical mastitis (90.9 days and 2.1). Cows initially diagnosed subclinical that became clinical during period 2 exhibited increased days to first service (93.9 days), days open (196.0 days) and services per conception (4.3) compared with control animals.

Researchers concluded that subclinical mastitis reduces reproductive performance of lactating dairy cows similar to clinical mastitis, and subclinical mastitis followed by clinical mastitis resulted in the most severe loss in reproductive performance. Concentrating efforts to identify and treat clinical and subclinical mastitis infections in early lactation, prior to breeding, may prove beneficial to improving reproductive performance in dairy herds.

## Heart of America Dairy Herd Improvement Summary

| | Quartiles | | | | Your Herd |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | |
| **Ayrshire** | | | | | |
| Rolling Herd Average | 20,080 | 15,058 | 14,530 | 12,374 | |
| Summit Milk Yield 1st | 64.0 | 0.00 | 60.0 | 46.5 | |
| Summit Milk Yield 2nd | 81.0 | 73.0 | 0.0 | 57.0 | |
| Summit Milk Yield 3rd | 88.0 | 0.0 | 0.0 | 65.0 | |
| Summit Milk Yield Avg. | 80.0 | 73.0 | 60.0 | 57.0 | |
| Income/Feed Cost | 1,771.0 | — | 606.0 | 701.0 | |
| SCC Average | 254.0 | 369.0 | 122.0 | 395.5 | |
| Days to 1st Service | 64.0 | 0.00 | 0.0 | 118.0 | |
| Days Open | 136.0 | 132.0 | 202.0 | 143.5 | |
| Projected Calving Interval | 13.70 | 13.60 | 15.90 | 13.90 | |
| **Brown Swiss** | | | | | |
| Rolling Herd Average | 19,165 | 16,781.17 | 15,235 | 14,074 | |
| Summit Milk Yield 1st | 59.17 | 58.33 | 51.33 | 49.0 | |
| Summit Milk Yield 2nd | 73.67 | 67.33 | 65.0 | 64.83 | |
| Summit Milk Yield 3rd | 79.50 | 73.83 | 70.33 | 64.17 | |
| Summit Milk Yield Avg. | 71.0 | 66.50 | 62.0 | 59.83 | |
| Income/Feed Cost | 1,542.60 | 1,491.33 | 1,128.4 | 867.0 | |
| SCC Average | 388.67 | 362.5 | 480.20 | 433.83 | |
| Days to 1st Service | 59.17 | 84.83 | 104.83 | 63.83 | |
| Days Open | 188.83 | 159.17 | 190.0 | 230.17 | |
| Projected Calving Interval | 15.43 | 14.43 | 15.45 | 16.78 | |
| **Guernsey** | | | | | |
| Rolling Herd Average | 15, 324.5 | 13,546 | 13,130 | 11,532 | |
| Summit Milk Yield 1st | 53.50 | 47.50 | 44.50 | 43.50 | |
| Summit Milk Yield 2nd | 62.50 | 58.00 | 59.0 | 67.0 | |
| Summit Milk Yield 3rd | 66.50 | 62.50 | 55.50 | 63.50 | |
| Summit Milk Yield Avg. | 61.00 | 56.50 | 52.50 | 59.50 | |
| Income/Feed Cost | 1,126.5 | 1,127.0 | 854.0 | 1,114.5 | |
| SCC Average | 338.0 | 277.0 | 228.0 | 331.0 | |
| Days to 1st Service | 105.5 | 88.0 | 141.0 | 47.5 | |
| Days Open | 166.0 | 155.0 | 178.5 | 249.0 | |
| Projected Calving Interval | 14.65 | 14.30 | 15.1 | 17.40 | |
| **Holstein** | | | | | |
| Rolling Herd Average | 23,186 | 20,125 | 17,971 | 14,525.02 | |
| Summit Milk Yield 1st | 73.44 | 66.44 | 60.92 | 52.68 | |
| Summit Milk Yield 2nd | 94.18 | 84.65 | 75.38 | 62.42 | |
| Summit Milk Yield 3rd | 99.49 | 89.65 | 81.03 | 68.16 | |
| Summit Milk Yield Avg. | 87.67 | 79.74 | 72.35 | 62.58 | |
| Income/Feed Cost | 1,727.48 | 1,426.88 | 1,235.77 | 928.45 | |
| SCC Average | 381.39 | 408.09 | 455.80 | 599.77 | |
| Days to 1st Service | 95.48 | 93.3 | 97.58 | 94.36 | |
| Days Open | 167.51 | 174.87 | 174.74 | 211.52 | |
| Projected Calving Interval | 14.72 | 14.96 | 14.96 | 16.17 | |
| **Jersey** | | | | | |
| Rolling Herd Average | 17,347 | 14,234 | 13,299 | 11,917 | |
| Summit Milk Yield 1st | 47.63 | 47.33 | 45.75 | 42.33 | |
| Summit Milk Yield 2nd | 68.88 | 60.67 | 43.75 | 56.89 | |
| Summit Milk Yield 3rd | 75.13 | 62.0 | 44.50 | 53.22 | |
| Summit Milk Yield Avg. | 68.13 | 56.56 | 52.75 | 50.33 | |
| Income/Feed Cost | 1,700.14 | 1,233.8 | 1,084.3 | 985.11 | |
| SCC Average | 286.5 | 374.56 | 493.75 | 498.0 | |
| Days to 1st Service | 66.38 | 92.67 | 65.88 | 87.56 | |
| Days Open | 137.13 | 148.56 | 238.38 | 143.22 | |
| Projected Calving Interval | 13.73 | 14.10 | 17.06 | 13.92 | |
| **Milking Shorthorn** | | | | | |
| Rolling Herd Average | 15,939 | 14,991 | 13,601 | 9,729 | |
| Summit Milk Yield 1st | 50.0 | 50.0 | 51.0 | 51.0 | |
| Summit Milk Yield 2nd | 66.0 | 70.0 | 61.0 | 0.0 | |
| Summit Milk Yield 3rd | 74.0 | 78.0 | 68.0 | 63.0 | |
| Summit Milk Yield Avg. | 69.0 | 65.0 | 60.0 | 57.0 | |
| Income/Feed Cost | — | 1,372.0 | 1,065.0 | — | |
| SCC Average | 239 | 312 | 193 | 161 | |
| Days to 1st Service | 108 | 82.0 | 91.0 | 85 | |
| Days Open | 174 | 124 | 136 | 129 | |
| Projected Calving Interval | 14.9 | 13.30 | 13.70 | 13.50 | |

## Hay Prices*—Kansas

| | Location | Quality | Price ($/ton) |
|---|---|---|---|
| Alfalfa | Southwestern Kansas | Supreme | 100-110 |
| Alfalfa | Southwestern Kansas | Premium | 90-100 |
| Alfalfa | Southwestern Kansas | Good | 90 |
| Alfalfa | South Central Kansas | Supreme | 100-110 |
| Alfalfa | South Central Kansas | Premium | 85-100 |
| Alfalfa | South Central Kansas | Good | — |
| Alfalfa | Southeastern Kansas | Supreme | 110 |
| Alfalfa | Southeastern Kansas | Premium | 85-100 |
| Alfalfa | Southeastern Kansas | Good | 85 |
| Alfalfa | Northwestern Kansas | Supreme | 100-105 |
| Alfalfa | Northwestern Kansas | Premium | 90-95 |
| Alfalfa | Northwestern Kansas | Good | — |
| Alfalfa | North Central/East Kansas | Supreme | 100-110 |
| Alfalfa | North Central/East Kansas | Premium | 90-100 |
| Alfalfa | North Central/East Kansas | Good | 80-85 |

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, *July 17, 2001.*

## Hay Prices—Oklahoma

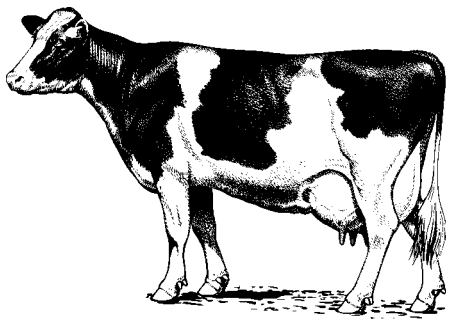
| | Location | Quality | Price ($/ton) |
|---|---|---|---|
| Alfalfa | Central/Western, OK | Premium | 90-120 |
| Alfalfa | Central/Western, OK | Good | 55-95 |
| Alfalfa | Panhandle, OK | Premium | 80-100 |
| Alfalfa | Panhandle, OK | Good | 75-90 |

***Source:*** Oklahoma Department of Agriculture, *July 12, 2001*

## Feed Stuffs Prices

| | Location | Price ($/ton) |
|---|---|---|
| Blood Meal | Central US | — |
| Canola Meal | | 162-172 |
| Corn Gluten Feed | Kansas City | 60-61 |
| Corn Gluten Meal | Kansas City | 255-260 |
| Corn Hominy | Kansas City | 59-69 |
| Cotton Seed Meal | Kansas City | 150-155 |
| Whole Cotton Seed | Memphis | 123 |
| Distillers Grains | Central Illinois | 80-85 |
| Pork—Meat and Bone Meal | Texas Panhandle | 185 |
| SBM 48% | Kansas City | 178-182 |
| Sunflower Meal | | 85 |
| Wheat Middlings | Kansas City | 52-54 |

***Source:*** USDA Feedstuff Market Review, *July 18, 2001*



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Dairy Lines is jointly published for dairy producers by the Department of Animal Sciences and Industry, K-State Research and Extension, and the Department of Animal Science, Oklahoma Cooperative Extension Service. For more information or questions, please contact 785.532.5654 (K-State) or 405.744.6058 (OSU).

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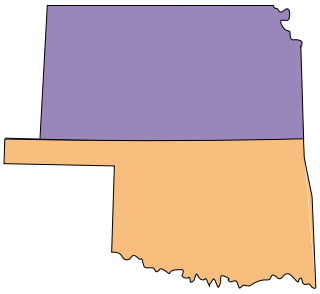

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