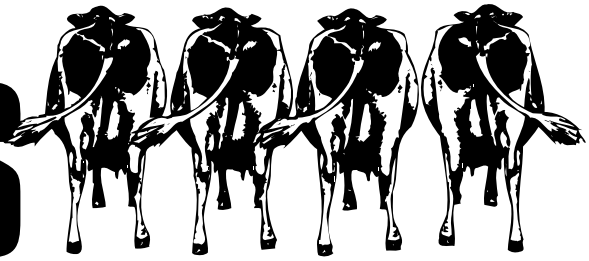
February 2002

# Dairy Lines



Volume 8, Number 2

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**Upcoming Events**

March 15-17
Youth Expo- Dairy Show
Oklahoma City, ,Okla.

March 21, 10 a.m.
PCDART, Producer Training
Animal Science Arena
Stillwater, Okla.

April 8–13
Holstein Southern National
Stillwater, Okla.

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**DAIRY RESEARCH & EXTENSION NEWS**
http://www.oznet.ksu.edu/dp_ansi/dairylin.htm

## Combination of soaking, fans most effective way to cool cows, study shows

***M.J. Brouk, J.F. Smith, and J.P. Harner***
***Kansas State University***

Summer seems a long way off, but before you know it we'll be dealing with heat stress. In the meantime, here are results of a study conducted by Kansas State University's dairy team that will help you keep your cows cooler this summer.

Have you ever wondered whether you should soak cows, increase airflow or both? Many producers have asked which is most important. Last summer our team conducted a study to determine the effect of soaking frequency and airflow on respiration rates and skin temperature of heat-stressed dairy cattle.

Sixteen heat-stressed lactating cows (8 primiparous and 8 multiparous) were arranged in a replicated 8-by-8 Latin square design. Cattle were housed in freestall dairy barns and milked two times. During testing, cattle were moved to a tie-stall barn for a two-hour period from either 1 p.m. to 3 p.m. or 3 p.m. to 5 p.m. on eight different days in late August and early September. Afternoon temperatures ranged between 88° F and 96° F.

During the testing period, respiration rates were determined every five minutes by visual evaluation. Skin temperature of three sites was measured with an infrared thermometer and recorded every five minutes. Treatments (Table 1) were four different soaking frequencies with and without supplemental airflow. Soaking frequencies were control (no soaking), every five, every 10 or every 15 minutes. Supplemental airflow was either none or 700 cfm. Each soaking cycle provided similar amounts of water for all treatments. Initial data were collected for three, five-minute periods before the start of the treatments.

Cows soaked every five minutes with supplemental airflow (5+F) re-

*continued on page 2*

***Table 1. Experimental Treatments.***

| Treatment | Soaking frequency* | Supplemental Airflow |
|---|---|---|
| 0 | None | None |
| 0 + F | None | 700 cfm |
| 5 | Every 5 minutes | None |
| 5 + F | Every 5 minutes | 700 cfm |
| 10 | Every 10 minutes | None |
| 10 + F | Every 10 minutes | 700 cfm |
| 15 | Every 15 minutes | None |
| 15 + F | Every 15 minutes | 700 cfm |

*.35 gallon/headlock applied in 1 minute

*Continued from page 1*

sponded with the fastest and largest drop in respiration rate, with the initial respiration rate reduced by 47 percent at the end of 90 minutes of treatment (Figures 1 and 2). Soaking cows every five minutes without airflow (5) resulted in a response similar to soaking cows every 10 minutes with airflow (10+F). Soaking cows every 15 minutes with airflow (15+F) and soaking cows every 10 minutes without airflow (10) resulted in similar responses until the last 30 minutes of the study. Supplemental airflow without soaking (0+F) resulted in little improvement over no soaking or airflow (0). Soaking had a greater effect on respiration rate than airflow. The combination of wetting and airflow had the greatest effect on the respiration rate. When cooling heat stressed dairy cattle, the most effective treatment included continuous supplemental airflow and wetting every five minutes.

This data suggests that different cooling strategies could be developed for different levels of heat stress. Under severe heat stress soaking every five minutes with fan cooling will be the most effective. During periods of moderate stress soaking every 10 minutes with fan cooling may be adequate. Reducing soaking frequency when temperatures are lower could significantly reduce water usage.

Data clearly indicate that the combination of soaking and supplemental fan cooling are superior to either single treatment. If used singularly, soaking cows would have more impact than the use of fans only for cow cooling. These data indicate that about one third of the total reduction in cow respiration rates was due to airflow and the remainder due to soaking. Under periods of severe heat stress, soaking every 15 minutes with airflow is not adequate, and soaking frequency must be increased.

Cow cooling with soaking and supplemental airflow is very effective in reducing respiration rate. Many systems may be ineffective because they do not deliver enough water to soak the cow, and soaking frequency is inadequate.

***Figure 1. Effect of Sprinkling Frequency and Airflow on Respiration Rate of Heat Stressed Dairy Cattle.***

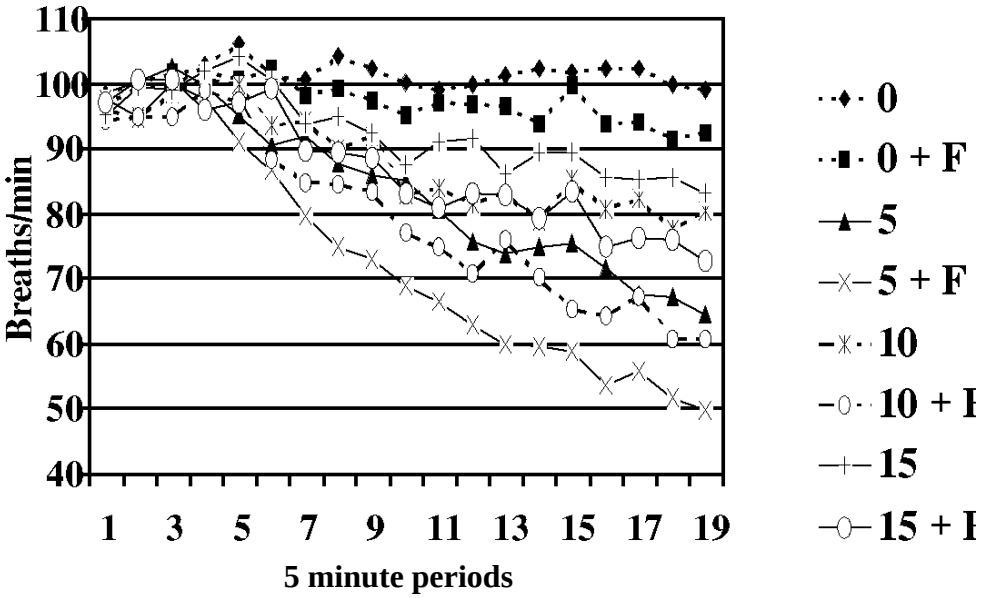
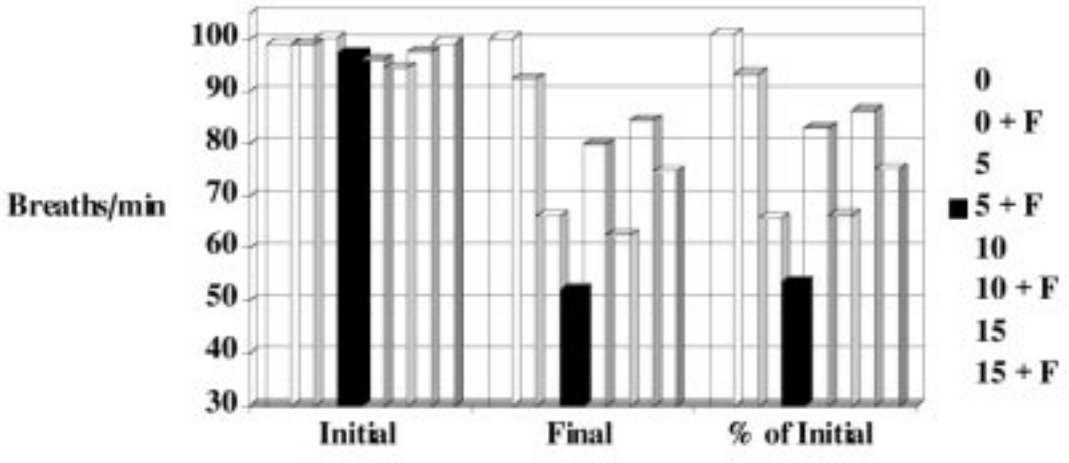



***Figure 2.*** **Initial, Final and Percentage of Initial Respiration Rate of Heat Stressed Dairy Cattle Treated with Different Cooling Strategies.**



## Heart of America Dairy Herd Improvement Summary

| | Quartiles | | | | Your Herd |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | |
| **Ayrshire** | | | | | |
| Rolling Herd Average | 18,486 | 16,049 | 14,807 | 12,457 | |
| Summit Milk Yield 1st | 67.0 | 57.5 | 26.5 | 42.0 | |
| Summit Milk Yield 2nd | 72.0 | 69.5 | 31.0 | 52.5 | |
| Summit Milk Yield 3rd | 43.0 | 69.5 | 59.0 | 64.5 | |
| Summit Milk Yield Avg. | 74.5 | 65.5 | 56.0 | 55.5 | |
| Income/Feed Cost | 1,676 | 1,248 | 1,475 | 607 | |
| SCC Average | 140 | 411 | 354 | 384 | |
| Days to 1st Service | 49 | 126 | 35.5 | 59.0 | |
| Days Open | 110 | 149 | 111 | 213 | |
| Projected Calving Interval | 12.8 | 14.1 | 12.9 | 16.2 | |
| **Brown Swiss** | | | | | |
| Rolling Herd Average | 19,945 | 17,284 | 15,630 | 13,614 | |
| Summit Milk Yield 1st | 64.6 | 49.1 | 54.5 | 44.8 | |
| Summit Milk Yield 2nd | 75.5 | 70.7 | 70.6 | 60.4 | |
| Summit Milk Yield 3rd | 92.0 | 79.5 | 71.1 | 65.4 | |
| Summit Milk Yield Avg. | 74.3 | 70.4 | 64.8 | 59.0 | |
| Income/Feed Cost | 2,013 | 1,684 | 1,131 | 1,131 | |
| SCC Average | 421 | 402 | 393 | 393 | |
| Days to 1st Service | 88 | 50 | 73 | 73 | |
| Days Open | 184 | 185 | 234 | 234 | |
| Projected Calving Interval | 15.2 | 15.3 | 16.9 | 16.9 | |
| **Guernsey** | | | | | |
| Rolling Herd Average | 18,930 | 15,153 | 13492 | 12,323 | |
| Summit Milk Yield 1st | 52.0 | 51.3 | 42.5 | 48.3 | |
| Summit Milk Yield 2nd | 36.0 | 61.6 | 54.0 | 56.0 | |
| Summit Milk Yield 3rd | 80.0 | 62.6 | 54.5 | 60.0 | |
| Summit Milk Yield Avg. | 71.0 | 58.6 | 51.5 | 56.3 | |
| Income/Feed Cost | 1,621 | 1,425 | 1,155 | 1,240 | |
| SCC Average | 283 | 317 | 154 | 380 | |
| Days to 1st Service | 92 | 107 | 90.5 | 102 | |
| Days Open | 136 | 188 | 195 | 187 | |
| Projected Calving Interval | 13.7 | 15.4 | 15.6 | 15.3 | |
| **Holstein** | | | | | |
| Rolling Herd Average | 22,774 | 19,943 | 19,943 | 17,614 | |
| Summit Milk Yield 1st | 72.4 | 65.7 | 65.7 | 59.5 | |
| Summit Milk Yield 2nd | 92.5 | 82.8 | 82.8 | 73.5 | |
| Summit Milk Yield 3rd | 97.5 | 87.7 | 87.7 | 79.0 | |
| Summit Milk Yield Avg. | 86.7 | 78.3 | 78.3 | 70.9 | |
| Income/Feed Cost | 2,113 | 1,775 | 1,775 | 1,520 | |
| SCC Average | 377 | 411 | 411 | 447 | |
| Days to 1st Service | 94 | 92 | 92 | 97 | |
| Days Open | 172 | 173 | 173 | 183 | |
| Projected Calving Interval | 14.8 | 14.9 | 14.9 | 15.2 | |
| **Jersey** | | | | | |
| Rolling Herd Average | 17,101 | 14,824 | 13,467 | 11,152 | |
| Summit Milk Yield 1st | 53.3 | 42.8 | 43.6 | 42.9 | |
| Summit Milk Yield 2nd | 58.7 | 60.4 | 54.7 | 53.2 | |
| Summit Milk Yield 3rd | 73.5 | 58.3 | 58.7 | 50.2 | |
| Summit Milk Yield Avg. | 64.6 | 57.8 | 52.7 | 49.8 | |
| Income/Feed Cost | 2,119 | 1,855 | 1,507 | 914 | |
| SCC Average | 363 | 321 | 351 | 568 | |
| Days to 1st Service | 84 | 71 | 89 | 86 | |
| Days Open | 142 | 138 | 142 | 194 | |
| Projected Calving Interval | 13.9 | 13.7 | 13.9 | 15.5 | |
| **Milking Shorthorn** | | | | | |
| Rolling Herd Average | 15,855 | 14,995 | 14,174 | 10,720 | |
| Summit Milk Yield 1st | 51.0 | 57.5 | 50.5 | 46.0 | |
| Summit Milk Yield 2nd | 56.0 | 65.5 | 64.5 | 54.5 | |
| Summit Milk Yield 3rd | 75.0 | 76.0 | 72.5 | 61.5 | |
| Summit Milk Yield Avg. | 62.0 | 65.5 | 63.5 | 55.0 | |
| Income/Feed Cost | 1,593 | 1,319 | 1,566 | 928 | |
| SCC Average | 217 | 189 | 273.5 | 377 | |
| Days to 1st Service | 83 | 45 | 86 | 102 | |
| Days Open | 88 | 221 | 124 | 187 | |
| Projected Calving Interval | 12.1 | 16.5 | 13.2 | 15.4 | |

## Hay Prices*—Kansas

| | Location | Quality | Price ($/ton) |
|---|---|---|---|
| Alfalfa | Southwestern Kansas | Supreme | 125-135 |
| Alfalfa | Southwestern Kansas | Premium | 105-120 |
| Alfalfa | Southwestern Kansas | Good | — |
| Alfalfa | South Central Kansas | Supreme | 120-135 |
| Alfalfa | South Central Kansas | Premium | 100-125 |
| Alfalfa | South Central Kansas | Good | — |
| Alfalfa | Southeastern Kansas | Supreme | 110-120 |
| Alfalfa | Southeastern Kansas | Premium | 100-110 |
| Alfalfa | Southeastern Kansas | Good | 80-90 |
| Alfalfa | Northwestern Kansas | Supreme | 110-120 |
| Alfalfa | Northwestern Kansas | Premium | 100-110 |
| Alfalfa | Northwestern Kansas | Good | — |
| Alfalfa | North Central Kansas | Supreme | 115-130 |
| Alfalfa | North Central Kansas | Premium | 100-115 |
| 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 Dept. of Ag Market News Service Report, *Feb. 15, 2002*

## Hay Prices—Oklahoma

| | Location | Quality | Price ($/ton) |
|---|---|---|---|
| Alfalfa | Central/Western, OK | Premium | 105-115 |
| Alfalfa | Central/Western, OK | Good | 95-105 |
| Alfalfa | Panhandle, OK | Premium | 110-120 |
| Alfalfa | Panhandle, OK | Good | 90-105 |

***Source:*** Oklahoma Department of Ag-USDA Market News Service,*Feb. 14, 2002*

## Feed Stuffs Prices

| | Location | Price ($/ton) |
|---|---|---|
| Blood Meal | Central US | 296-300 |
| Corn Gluten Feed | Kansas City | 67-71 |
| Corn Gluten Meal | Kansas City | 240-255 |
| Corn Hominy | Kansas City | 75-78 |
| Cotton Seed Meal | Kansas City | 150-152 |
| Whole Cotton Seed | Memphis | 90 |
| Distillers Grains | Nebraska | 75-90 |
| Pork—Meat and Bone Meal | Texas Panhandle | 160 |
| SBM 48% | Kansas City | 153-155 |
| Wheat Middlings | Kansas City | 57-62 |

***Source:***USDA Market News Service, *February 13, 2002*

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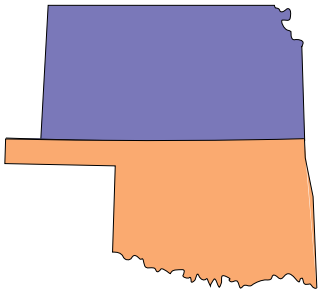

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