March 2000

Dairy Lines

Volume 6, Number 3

Co-Editors

John F. Smith
Extension Specialist, Dairy Science

Dan Waldner
Extension Specialist, Dairy Science

Mike Brouk
Extension Specialist, Dairy Science

Contributors

Karen Schmidt
Professor, Dairy Products

John Shirley
Professor, Dairy Science

Jeff Stevenson
Professor, Dairy Science

Dave Sukup
Manager, Heart of America DHI

Kansas Upcoming Events

MARCH 31
KDA Dairy Tour
Kerri Ebert 785-456-8357

APRIL 15
Central Kansas Spring Dairy Show, Beef Area, State Fairgrounds, Pre-entry due March 31. Sue Nisly 316-567-2924

June 21 & 22
Heart of America Dairy Mngt. Conference, St. Joseph, MO, John Smith 785-532-1203; Mike Brouk 785-532-1207

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

Reducing Heat Stress in Holding Pens

J.P. Harner, J.F. Smith, M. Brouk and J.P. Murphy, Kansas State University
K-State Research & Extension Dairy Team

Dairy cows experience heat stress when the temperature humidity index (THI) exceeds 72. This index is based on the relationship of temperature and relative humidity. Many dairies utilize shades, fans and/or sprinklers for cooling cows at the feedline and in the lounging areas. An area often overlooked is the holding pen—where cows may be standing from 2 to 6 hours per day depending on milking parlor performance and group size.

Cooling needs to be considered in the milk parlor holding pen. Research showed that, without cooling, the body temperature of a cow increased 3°F within 20 minutes after entering the holding pen. When an overhead spray system and fans were installed, the cows' body temperature was lowered by 3.5°F during the time the cows were in the holding pen. This study showed the cooled cows, produced 1.8 pounds of milk per day more than those cows not cooled. Another research trial showed an increase in milk production of 5 pounds per day when the cows were cooled five times per day for 30 minutes in the holding pen. Heat stress not only affects milk production during the hot periods but can also affect reproduction and milk production into the cooler months. Cows will give off approximately 4,500 BTU's per hour when temperatures exceed 80°F . About half of this energy is in moisture (latent heat) and the remainder is sensible. This heat production per cow is similar to a 1,500-watt hair dryer blowing continuously at high speeds.

Altering Group Sizing

Modern dairies strive to limit the time cows are away from feed and water to no more than 2 to 3 hours per day. Many small dairies house cows in one large group. Often with these dairies, the cows are away from feed and water from 4 to 6 hours per day. This results in cows being away from feed and water for 15 to 25 percent of the day. Gates, electric fences or panels may be an economical way to subdivide the cow herd into multiple groups during the summer months to reduce time standing in the holding pen.

Proper group sizing can help reduce heat stress with minimal investment in equipment or facilities. Cows should be grouped together such that they are in the holding pen less than 1 hour per milking when milking 2X. Herds milking 3X should reduce the time in the holding pen to less than 45 minutes per milking.

Adjusting Milk Parlor Schedule

Dairies with milk parlors not used at full capacity (more than 12 hours per day) may be able to alter their milk schedule. The objective is to avoid, as much as possible, milking from 1 p.m. to 7 p.m. For example, a dairy milking two times per day may switch from a 5 a.m. and 5 p.m. milking to 10 a.m. and 10 p.m. milking. A herd being milked three times per day may switch to milking at 3 a.m., 11 a.m. and 7 p.m. to avoid having cows in the holding pen during the heat of the day. Dairies may also consider changing the order of the groups of cows being milked. Heifers are able to tolerate heat more than mature cows. A high-producing group should be milked during the cooler periods of the milking shift.

continued on pages 2 and 3

Heart of America Dairy Herd Improvement Summary (March)

	Quartiles				Your Herd
	1	2	3	4	
Ayrshire					
Rolling Herd Average	17,039	13,985	13,131	10,823	
Summit Milk Yield 1st	58.5	50.5	24.5	41.3	
Summit Milk Yield 2nd	75	55	53	31.3	
Summit Milk Yield 3rd	79	63.5	32.5	55	
Summit Milk Yield Avg.	71	57.5	52.5	50.6	
Income/Feed Cost	1,413	762	1,109	681	
SCC Average	275	278	202	171	
Days to 1st Service	109.5	114	77	115	
Days Open	124.5	138.5	98.5	149	
Projected Calving Interval	13.3	13.8	12.5	14.1	
Brown Swiss					
Rolling Herd Average	19,435	16,086	14,754	12,178	
Summit Milk Yield 1st	60	51.7	47.7	45.1	
Summit Milk Yield 2nd	74.5	55.2	50.1	55.7	
Summit Milk Yield 3rd	85.5	69.8	65	55.2	
Summit Milk Yield Avg.	73.6	62.7	58.4	54.1	
Income/Feed Cost	1,697	1,292	1,379	1,008	
SCC Average	410	376	327	393	
Days to 1st Service	167	79.8	82	45	
Days Open	175	164	155	249	
Projected Calving Interval	15	14.6	13.8	17.4	
Guernsey					
Rolling Herd Average	16,886	15,618	14,794	12,238	
Summit Milk Yield 1st	62	54.5	51	44.5	
Summit Milk Yield 2nd	0	67.5	61	54.5	
Summit Milk Yield 3rd	0	61	72.5	54	
Summit Milk Yield Avg.	62	60.5	60.5	51.5	
Income/Feed Cost	1,643	1,422	1,305	1,015	
SCC Average	63	340	235	289	
Days to 1st Service	0	81	101.5	92	
Days Open	104	169.5	129	164	
Projected Calving Interval	12.6	14.8	13.4	14.6	
Holstein					
Rolling Herd Average	22,783	19,684	17,345	14,245	
Summit Milk Yield 1st	72.6	64.8	59.1	50.1	
Summit Milk Yield 2nd	92.2	82.4	73.3	61.4	
Summit Milk Yield 3rd	97.7	87.9	79.1	66.5	
Summit Milk Yield Avg.	86.3	78.0	71	61	
Income/Feed Cost	1,955	1,616	1,349	1,083	
SCC Average	332	368	382	478	
Days to 1st Service	89	92	85	86	
Days Open	159	163	172	195	
Projected Calving Interval	14.4	14.6	14.8	15.6	
Jersey					
Rolling Herd Average	17,235	14,194	13,000	10,576	
Summit Milk Yield 1st	54	50.5	45	38.5	
Summit Milk Yield 2nd	51	51.6	53.1	45.5	
Summit Milk Yield 3rd	72	55.9	59.4	49.1	
Summit Milk Yield Avg.	64.5	57.6	53.6	44.8	
Income/Feed Cost	1,794	1,472	1,296	761	
SCC Average	305	306	302	466	
Days to 1st Service	75	74	77	84	
Days Open	147	140	139	139	
Projected Calving Interval	14.0	13.8	13.8	13.8	
Milking Shorthorn					
Rolling Herd Average	16,471	14,308	13,121	11,132	
Summit Milk Yield 1st	61.0	52.0	51.0	41.0	
Summit Milk Yield 2nd	83	62.5	61.5	55.5	
Summit Milk Yield 3rd	84	73.0	68.5	63.5	
Summit Milk Yield Avg.	76.0	63.5	62	55.5	
Income/Feed Cost	—	1,450	1,196	850	
SCC Average	60	312	260	301	
Days to 1st Service	57	78	39.5	73	
Days Open	106	121	200	90	
Projected Calving Interval	12.7	13.2	15.7	12.2	

Providing Fresh Water When Leaving the Parlor

Cows should have access to fresh water immediately upon exiting the milk parlor. In parlors that are double 25's or smaller, one 8-foot trough is usually sufficient. In parlors larger than double 25's, two 8-foot troughs are needed. It is important to provide fresh/cool water. Therefore, the watering trough needs to be easy to empty for cleaning. A water trough that is warmed by the afternoon sun should be emptied immediately prior to the afternoon milking and refilled with fresh water. Watering troughs at the exit lanes should be placed in the shade or have shade constructed over them.

Sidewall Openings

Holding pens should have open sidewalls. It is recommended sidewalls be opened at least 60 percent. Opening the sidewall will enhance natural ventilation. Caution should be exercised to ensure no structural damage is done to the holding pen if the side walls are modified. Sidewall curtains or hinged doors can be used to protect the cows during the cold weather.

Ridge Ventilation

Heat naturally rises and becomes trapped near the ceiling or peak of the holding pen. Removal of the ridge cap or opening the ridge can help remove or release heat accumulating in the peak of the building. Large roof vents, wind turbines or mechanical roof ventilators can be used if the ridge cannot be opened. Removal of this trapped heat may also help maintain a cooler milk parlor.

Fan Sizing and Placement

The fan system should be able to move 1,000 cubic feet of air per minute per cow (cfm/cow). In the holding pen, the total ventilation rate is based on the maximum number of cows in the holding pen. Most 30- and 36-inch fans will move between 10,000 and 12,000 cfm per fan. Therefore, one fan should be installed per 10 cows or 150 sq.ft. of holding pen area. A 48-inch fan will move approximately 20,000 cfm of air per fan. One 48-inch fan is required per 20 cows of 300 sq.ft. of pen space. The 48-inch fans should only be used if the clearance from the bottom of the fan cage to the floor is at least 8 to 9 feet for equipment clearance. Also, it may be more advantageous to use more 30- or 36-inch fans than 48-inch fans to minimize any dead air zones in the holding pen.

Many older diaries have holding pens which are less than 24 feet wide and 8 to 10 feet sidewall openings. These holding pens can most easily be mechanically ventilated by installing 30- or 36-inch fans in the side walls. Fans should be oriented to take advantage of the prevailing winds. Using the design guideline of 1 fan per 150 sq.ft., holding pens less than 24 feet should have fans installed 6 to 8 feet on center along the sidewalls. It may be advantageous to install 60 to 70 percent of the required fans closer together in the area which represents 50 percent of the holding pen floor space closest to the milk parlor.

Fans should be installed near the eave of the sidewalls and tilted downward at 15 to 30 degrees. The tilt angle is better determined by adjusting the fan such that air movement directly in front of the fan can be felt the width of the holding pen and at the height of the cows back. Holding pens which have a ceiling can utilize sprinkler systems on the fan cages or mount the plumbing to the ceiling providing it does not interfere with equipment.

Holding pens with sidewall heights higher than 10 to 12 feet are probably best mechanically ventilated by installing rows of fans perpendicular to the cow movement into the milk parlor. Spacing between the rows will be adjusted based on where the fan mounting brackets are attached to the structure. The distance between fans within a row is 6 to 8 feet regardless of fan sizes. The distance between fan rows is 20 feet for 30- or 36-inch fans and 40 feet for 48-inch fans.

Sprinkler Systems

Sprinkler systems are used to wet the cow's back and can be used in the holding pen. Water sprinkler systems should never be installed in a holding pen without a mechanical ventilation system. The increase in humidity and THI can cause severe stress on the cows. At high humidity and temperatures above 85°F, cows may die in the holding pen due to humidity and inability to exhaust heat through breathing.

Sprinkler systems should be sized based on providing 0.03 gallons of water per square foot of area (gal/sq.ft.). In the holding pen, it is preferred to have shorter on cycles, with 1 minute on and 6 minutes off being recommended. However, many water distribution systems may not be able to handle the high flow rate demands of the sprinkler system whether nozzles or spray lines are used. Another option in larger holding pens is to sequence the nozzle such that only a portion of the nozzles is on at any one time. The time the sprinkler nozzles are on may need to be reduced if a cow's udder is getting wet. Approximately one 360° nozzle with 8-foot spray diameter per 3 cows is required. In the holding pen, spray nozzle overlap is not as critical as in the lounging area or along the feedline. The nozzle spacing is equal to the spray diameter. If the spray diameter is 8 feet, then the nozzles are placed in an 8 foot by 8 foot grid. The nozzle should have a rating of at least 25 gallons per hour to deliver 0.03 gal/sq.ft. within a 1-minute period.

The plumbing must be sized to provide the necessary flow rates to each of the distribution lines. The main distribution line can be located at one end of the holding pen if its length is less than 100 feet. Longer holding pens should have the main distribution pipe installed at the center and then branched lines to distribute water to either end.

Another option is to install a spray line or mister on the fan cages. The spray line should be able to deliver 3 to 4 gpm. Water requirements from the well or water supply are determined by multiplying the number of fans by 3. Fans should be waterproof to avoid any electrical shock.

Summary

The holding pen adjacent to the milk parlor is the most stressful area on the farm for dairy cows. Cows that are producing large amounts of body heat are brought into small confined areas for extended periods 2 to 3 times per day. Artificial cooling in these areas can reduce summer heat stress. Five management steps can be taken to minimize heat stress in the holding pen:

Step 1. Reduce group size to minimize time in the holding pen;
Step 2. Alter milking times if the parlor is not used at full capacity;
Step 3. Open up holding pen sidewalls and ridge to enhance natural ventilation;
Step 4. Install fans to mechanically ventilate the holding pen on hot/still summer days; and
Step 5. Install sprinkler systems to increase the evaporative cooling from the cows.

Hay Prices*—Kansas

	Location	Quality	Price ($/ton)
Alfalfa	Southwestern Kansas	Supreme	95–115
Alfalfa	Southwestern Kansas	Premium	70–105
Alfalfa	Southwestern Kansas	Good	50–70
Alfalfa	South Central Kansas	Supreme	95–110
Alfalfa	South Central Kansas	Premium	75–90
Alfalfa	South Central Kansas	Good	55–75
Alfalfa	Southeastern Kansas	Supreme	---
Alfalfa	Southeastern Kansas	Premium	80–90
Alfalfa	Southeastern Kansas	Good	60–75
Alfalfa	Northwestern Kansas	Supreme	—
Alfalfa	Northwestern Kansas	Premium	80–90
Alfalfa	Northwestern Kansas	Good	50–70
Alfalfa	North Central Kansas	Supreme	---
Alfalfa	North Central Kansas	Premium	75–100
Alfalfa	North Central Kansas	Good	50–70

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, *March 3, 2000*

OKLAHOMA UPCOMING EVENTS

Spring Fair Dairy Show
March 24-26 • OKC Fairgrounds

Oklahoma Holstein Show and Sale
April 7 & 8 • Payne Co. Fairgrounds, Stillwater, OK

Southwest Dairy Field Day
May 11 • Horizon Dairy, Hico, TX

2000 Dairy Field Days & Judging Clinics
Registration 9:00am, Contest 10:00am
Brown Swiss & Jersey Field Day
June 8 • Evans Agri. Center, Perkins, OK (On S.H. 33 NE of Perkins)
Guernsey Field Day
June 9 • Trible Dairy, Ripley, OK
Grady Co. Dairy Judging Clinic & Milking Shorthorn Field Day
June 13 • Grady Co. Fairgrounds, Chickasha, OK
(1.5mi. West of I-44 & Hwy 62 junction)
Holstein Field Day
June 15 • Oklahoma State University Dairy Unit
(* mi. west of Western on McElroy)

Sooner State Dairy Cattle Judging Contest
July 28 • Registration: 8:30am, Contest 9:00am
Payne Co. Fairgrounds, Stillwater, OK

Sooner State Dairy Quiz Bowl
July 28 • Opening rounds: 1:00pm, Finals: 7:00pm
Payne Co. Fairgrounds, Stillwater, OK

Hay Prices—Oklahoma

	Location	Quality	Price ($/ton)
Alfalfa	Central/Western, OK	Premium	80–120
Alfalfa	Central/Western, OK	Good	75–85
Alfalfa	Panhandle, OK	Premium	85–95
Alfalfa	Panhandle, OK	Good	75–85

Source: Oklahoma Department of Agriculture, *March 2, 2000*

Feed Stuffs Prices

	Location	Price ($/ton)
Blood Meal	Texas Panhandle	400
Corn Gluten Feed	Kansas City	58–64
Corn Gluten Meal	Kansas City	245–255
Corn Hominy	Kansas City	75–78
Cotton Seed Meal	Kansas City	146–148
Whole Cotton Seed	Memphis	120
Distillers Grains	Central Illinois	70–79
Pork—Meat and Bone Meal	Texas Panhandle	160
SBM 48%	Kansas City	164–170
Wheat Middlings	Kansas City	62–65

Source: USDA Feedstuff Market Review, *March 1, 2000*

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U.S. DEPARTMENT OF AGRICULTURE
KANSAS STATE UNIVERSITY
MANHATTAN, KANSAS 66506

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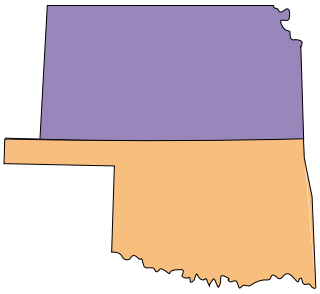

Kansas State University
K-State Research & Extension
Department of Animal Sciences and Industry
Call Hall, Room 139
Kansas State University
Manhattan, Kansas 66506

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John Smith
Extension Specialist
Dairy Science
K-State

Mike Brouk
Extension Specialist
Dairy Science
K-State

Dan Waldner
Extension Specialist
Dairy Science
Oklahoma State

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