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Dairy Lines

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DAIRY RESEARCH & EXTENSION NEWS

http://www.oznet.ksu.edu/dp_ansi/dairylin.htm

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Upcoming Events

January 9—10 am
Brown Swiss Breeder's Association Meeting
OSU Animal Science Building

January 18—10 am
Oklahoma PDCA Annual Meeting
OSU Animal Science Arena

January 26—10 am–2 pm
MO-AR Dairy Meetings
West Plains, MO

January 27—10 am–2 pm
MO-AR Dairy Meetings
Bentonville, AR

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What We Learned About Cooling Cows in Kansas This Summer

J.F. Smith, M.J. Meyer, J.P. Harner III, J.E. Shirley, E.C. Titgemeyer

Elevated temperature and humidity during the summer months can have a dramatic affect on milk production of dairy cows. Heat stress occurs when the cow's heat load is greater than her capacity to lose heat. The cow's heat load increases as the mean summer temperature and relative humidity increases, while her ability to dissipate heat decreases. Cows regulate body temperature by increasing respiration rate, water consumption, and sweating, and by decreasing dry matter intake. These events result in depressed milk production and poor reproductive performance because of the shift in energy from these functions to body temperature regulation. The primary way dairy cows dissipate heat during heat stress is by evaporative cooling. Evaporative cooling occurs when sweat or other moisture is evaporated from the skin or respiratory tract. This explains why dairy cattle sweat and have increased respiration rates when they are experiencing heat stress.

Ninety-six holstein cows averaging 115 days in milk (DIM), and 60 holstein first-calf heifers averaging 97 DIM at the initiation of a 10-week study running from June 10 to August 22 were used to evaluate the effectiveness of three different cooling systems. Thirty-two multiparous cows and 20 first-calf heifers were assigned to one of three pens, with each pen containing a different cooling system. The three cooling systems consisted of (1) a single row of 36-inch fans, spaced at 24-foot intervals over the free stalls and over the feed row (FF), (2) 56-inch ceiling fans, spaced at 12-foot intervals over the free stalls (CF), and (3) polytube longitudinal cooling over the free stalls (PT). Each of the three cooling systems utilized the similar sprinkler systems located over the feed line. Dry matter intake, respiration rates, milk production, and body condition scores were collected and compared among the three pens.

Summer average milk production was significantly affected by the different cooling systems. Cows in the FF pen produced an average of 5.5 lbs/day more milk than CF and 6.7 lbs/day more milk than PT ($p<0.05$). Milk yield of multiparous cows appeared to be more dramatically affected by the different cooling systems, as cows housed in FF produced an average of 93.3 lbs/cow/day and CF and PT produced an average of 87.3 and 82.3 lbs/cow/day, respectively. Milk production of first lactation heifers was not as dramatically effected by the different cooling systems. Heifers in FF pen produced 5.1 and 2.4 lbs milk/cow/day more than CF and PT, respectively. Cows housed in FF produced 6.0 and 11.0 lbs/cow/day more than CF and PT, respectively.

Table 1 shows the summer average respiration rates for the heifers and cows combined. Throughout the summer, cows in FF had an average respiration rate of 8.3 breaths/minute less than CF and 7.1 breaths/minute less than PT ($p<0.05$).The respiration rates of cows in

continued on page 2

Heart of America Dairy Herd Improvement Summary (October

	Quartiles				Your Herd
	1	2	3	4	
Ayrshire					
Rolling Herd Average	16,495	14,431	12,116	10,432	
Peak Milk Yield 1st	66.0	56.0	48.5	39.5	
Peak Milk Yield 2nd	77.0	67.3	52.5	51.0	
Peak Milk Yield 3rd	86.0	75.6	67.5	66.3	
Peak Milk Yield Avg.	76.0	63.6	58.0	62.0	
Income / Feed Cost	917	826	832	420	
SCC Average	307	285	351	286	
Days to 1st Service	77	89	90	107	
Days Open	116	120	137	171	
Projected Calving Interval	13.0	13.1	13.7	14.8	
Brown Swiss					
Rolling Herd Average	20,425	16,159	14,332	13,894	
Peak Milk Yield 1st	66.8	56.5	51.3	50.8	
Peak Milk Yield 2nd	86.4	75.1	61.6	67.3	
Peak Milk Yield 3rd	92.8	80.1	69.5	73.5	
Peak Milk Yield Avg.	82.4	70.6	63.3	63.8	
Income / Feed Cost	1,484	1,274	1,078	879	
SCC Average	308	297	293	324	
Days to 1st Service	83	87	71	47	
Days Open	153	143	185	138	
Projected Calving Interval	14.2	13.9	15.3	13.7	
Holstein					
Rolling Herd Average	22,301	19,467	17,407	14,318	
Peak Milk Yield 1st	78.6	70.0	64.0	55.8	
Peak Milk Yield 2nd	97.4	87.1	78.4	66.5	
Peak Milk Yield 3rd	104.5	93.4	84.6	72.4	
Peak Milk Yield Avg.	92.3	82.9	75.7	66.2	
Income / Feed Cost	1,723	1,463	1,237	959	
SCC Average	329	355	382	460	
Days to 1st Service	89	89	81	72	
Days Open	157	164	166	179	
Projected Calving Interval	14.4	14.6	14.6	15.1	
Jersey					
Rolling Herd Average	16,370	13,804	12,161	9,792	
Peak Milk Yield 1st	55.7	49.0	47.5	40.0	
Peak Milk Yield 2nd	69.1	59.9	55.4	46.7	
Peak Milk Yield 3rd	74.6	63.7	58.6	50.3	
Peak Milk Yield Avg.	67.6	58.0	54.9	46.0	
Income / Feed Cost	1,499	1,136	939	661	
SCC Average	321	284	287	396	
Days to 1st Service	68	82	84	67	
Days Open	124	132	140	169	
Projected Calving Interval	13.3	13.5	13.8	14.8	
Milking Shorthorn					
Rolling Herd Average	14,715	13,623	13,099	11,283	
Peak Milk Yield 1st	55.0	53.0	47.0	51.0	
Peak Milk Yield 2nd	66.0	56.0	55.0	58.5	
Peak Milk Yield 3rd	78.0	74.0	68.0	60.0	
Peak Milk Yield Avg.	67.0	64.0	58.0	56.5	
Income / Feed Cost	1,360	1,257	954	843	
SCC Average	382	309	317	155	
Days to 1st Service	80	81	91	16	
Days Open	107	115	159	198	
Projected Calving Interval	12.7	13.0	14.4	15.7	

Hay Prices—Oklahoma

	Location	*Quality*	*Price ($/ton)*
Alfalfa	Central / Western, OK	Premium	100–125
Alfalfa	Central / Western, OK	Good	85–100
Alfalfa	Panhandle, OK	Premium	95–110
Alfalfa	Panhandle, OK	Good	85–95

Source: Oklahoma Department of Agriculture, *January 3, 1999*

Cooling Cows continued from page 1

CF and PT tended to be similar throughout the summer, with a difference of only 1.3 breaths / minute.

Total amount of feed fed and refused and number of cows per pen was recorded daily. This information was used to calculate dry matter intake per cow per day. Due to the fact that this data represents averages of all the cows and heifers in the pens, statistical analysis could not be completed. Higher dry matter intakes were recorded with increased milk production and reduced respiration rates. Average DMI for FF, CF, and PT were 44.7, 42.1, and 42.1 lbs / cow / day, respectively.

The body condition of cows and heifers was evaluated at the beginning and end of the study. Cows and heifers in FF, CF, and PT gained an average of 0.32, 0.22, and 0.18 BCS points respectively. Mature cows housed in FF gained more conditioning than those in PT ($p<0.01$).

In summary, all three cooling systems reduced the negative effects of heat stress. The 36-inch fans (FF) had the highest milk production and dry matter intakes and the lowest respiration rate.

Acknowledgments

We thank Duane and Rhonda Meier, Meier Dairy Inc., for their participation in this study and the Kansas Dairy Commission and Monsanto for funding the project.

Kansas Quality Milk Award Winners—1998

Small Herd: <50 Cows
1st Place: Laverne Figge, Onaga
2nd Place: Randy Osmun, Holton
3rd Place: Thomas A. Haverkamp, Seneca

Medium Herd: 50-100 Cows
1st Place: Donald & Barbara Kiehl, Pomona
2nd Place: Henne Farms, Gypsum
3rd Place: Harold Morrical, Beverly

Large Herd: >100 Cows
1st Place: Sperfslage Dairy, Oneida
2nd Place: Kramer Dairy Farm, Corning
3rd Place: Flory Dairy #2, Lawrence

Upcoming Events

February 8—10 am–2 pm
Oklahoma District DHIA Meeting
Mayes County Extension Office
Pryor, OK

February 9—10 am–2 pm
Oklahoma District DHIA Meeting
Grady County Extension Office
Chickasha, OK

Contact Dan Waldner at 405-744-6058 for more information on the previous events.

District Dairy Meeting

January 20
Extension Office
OTTAWA

January 22
Valentino's Restaurant
SENECA

January 25
First Mennonite Church
HILLSBORO

January 28
Red Coach Inn
Exit 13 I-35 & 53rd St.
WICHITA

January 29
Amish Community Building
WHITESIDE

Clip and send to one of the addresses to the right.

Please reserve (No.) ____ meals for the District DHIA Meeting.

Name: _____

_____

Dairy Lines

AGENDA

10:00 a.m.	Registration
11:00 a.m.	Local DHIA Associations
NOON	Lunch—*Sponsored by the Heart of America DHIA*
1:00 p.m.	DHIA Update
2:00 p.m.	Educational Sessions
3:30 p.m.	Adjourn

To plan for meals, please make your reservation by January 15. Please clip and return the reservation slip or call one of the following K-State Research and Extension Offices:

Darren Hibdon
Franklin County Agent
1418 S. Main, Suite 2
Ottawa, KS 66067
785-229-3520

David Key
Nemaha County Agent
604 Nemaha, Ste. 201
Seneca, KS 66538
785-336-2184

Steve Tonn
Marion County Agent
Box 178
Marion, KS 66861
316-382-2325

Dave Sukup
Heart of America DHIA
628 Pottawatomie
Manhattan, KS 66502
785-539-1784

Greg McCormack
Reno County Agent
2 W. 10th
South Hutchinson,
KS 67505
316-662-2371

Hay Prices—Kansas*

	Location	*Quality*	*Price ($/ton)*
Alfalfa	Southwestern Kansas	Premium	85–100
Alfalfa	Southwestern Kansas	Good	65–80
Alfalfa	South Central Kansas	Premium	80–95
Alfalfa	South Central Kansas	Good	65–75
Alfalfa	Southeastern Kansas	Premium	85–100
Alfalfa	Southeastern Kansas	Good	80
Alfalfa	Northwestern Kansas	Premium	85–100
Alfalfa	Northwestern Kansas	Good	80
Alfalfa	North Central Kansas	Premium	85–95
Alfalfa	North Central Kansas	Good	80–85

Source: USDA Weekly Hay Report, *Week ending December 11, 1998*

*Premium Hay RFV = 170–200
Good Hay RFV = 150–170

Feed Stuffs Prices

	Location	*Price ($/ton)*
SBM 48%	Kansas City	149.80–155.80
Cotton Seed Meal	Kansas City	146.50–148
Whole Cottonseed	Memphis	160
Blood Meal	Central United States	270–300
Corn Hominy	Kansas City	65–70
Corn Gluten Feed	Kansas City	75–85
Corn Gluten Meal 60%	Kansas City	300–310
Distillers Dried Grain	Central Illinois	76–82
Brewers Dried Grain	St. Louis	NA
Wheat Middlings	Kansas City	63–66

Source: USDA Weekly Feed Stuffs Report, *Week ending December 9, 1998*

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KANSAS STATE UNIVERSITY
MANHATTAN, KANSAS 66506

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For more information or questions, please contact 913.532.5654 (K-State) or 405.744.6058 (OSU).

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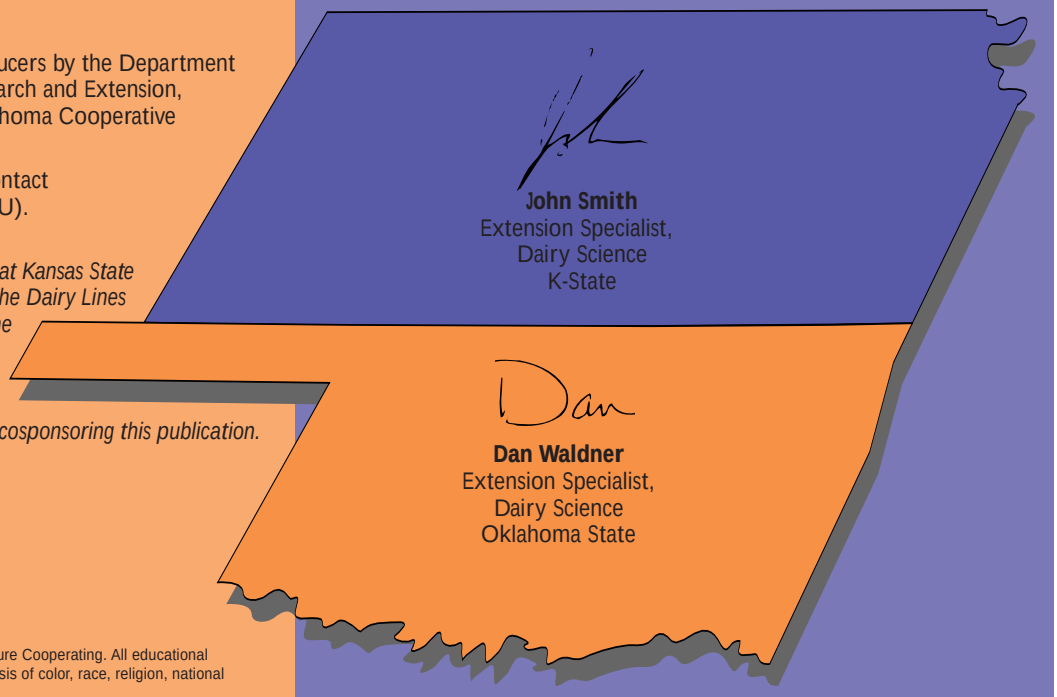

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