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Dairy Lines

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DAIRY RESEARCH & EXTENSION NEWS

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Upcoming Events

World Dairy Expo
September 29–October 3
Madison, WI

K-State Research and Extension
1999 Dairy Day
November 17—Hillsboro, KS
November 18—Whiteside, KS
November 19—Seneca, KS

Grouping Strategies to Maximize Milk Production, Cow Health, and Labor Efficiency

Michael J. Brouk, John F. Smith and Joe P. Harner III

The size and number of cow groups on a dairy are critical planning factors. Factors affecting the number and types of groups are largely associated with maximizing cow comfort, feeding strategies, reproduction and increasing labor efficiency. Lactating cows (100%) are allotted to one of four groups; healthy (92%), fresh (4%), sick (2%), or slow milkers and lame (2%). Healthy cows should account for 92% of the total number of lactating cows and are typically divided into 8 groups. Group size is determined by the size of the parlor and milking frequency.

Observations on commercial dairies would indicate that a group should be milked in 60 minutes when milking 2× per day; 40 minutes when milking 3× per day; and 30 minutes when milking 4× per day. This will prevent the cows from being kept away from feed and water to no more than 2 hours per day. Within the 8 groups of healthy lactating cows, individual cows are assigned to pens based on nutritional requirements, reproductive status, and social factors.

First, heifers respond favorably when grouped separately from older cows. Heifers have lower dry matter intakes and greater growth requirements as compared to older cattle. In addition, mixing heifers with older cattle increases social pressure resulting in less-than-optimal heifer performance. Heifers should be kept in separate groups and divided based on reproductive status. Heifers could be grouped as open, not breeding, breeding, and pregnant. This increases labor efficiency during breeding by concentrating all breeding activities to one pen. The remaining healthy lactating cows are allotted to groups by reproductive status and nutritional needs. Nutritional requirements for these groups vary and, as above, concentrating breeding activities maximizes labor efficiency. One disadvantage to the previous grouping scheme is the need to move cows from pen to pen.

Movement of cattle increases labor requirements and disrupts the social order in a pen. Usually, 3 to 4 days are required to reestablish social order when cattle move to a new pen. The result is reduced feed intakes and lost milk production. As a result, some producers have chosen to freshen cows as a group and maintain the group throughout lactation. Rather than moving the cows to the correct diet or management area, this strategy brings the diet and management to the cow. The difficulty in this system is calving enough cows to fill a pen in less then 30 days.

In addition to the healthy lactating cows, some of the lactating cows will have special requirements. Separating fresh, sick, lame or slow milking cows increases parlor and treatment labor efficiency as well as reducing stress on the cattle. Fresh cows will account for 4% of the healthy herd size assuming that the number of calvings annually is 115% of lactating cows. The fresh

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Heart of America Dairy Herd Improvement Summary (August)

	Quartiles				Your Herd
	1	2	3	4	
Ayrshire					
Rolling Herd Average	18,008	14,496	11,657	8,231	
Summit Milk Yield 1st	61.0	51.5	41.0	38.0	
Summit Milk Yield 2nd	75.0	64.0	48.0	22.5	
Summit Milk Yield 3rd	81.0	64.0	57.0	26.5	
Summit Milk Yield Avg.	72.0	58.5	53.0	43.0	
Income/Feed Cost	1,767	1,266	1,118	409	
SCC Average	230	308	314	204	
Days to 1st Service	85	81	126	46.5	
Days Open	149	130	131	189	
Projected Calving Interval	14.1	13.5	13.5	15.4	
Brown Swiss					
Rolling Herd Average	19,641	15,723	14,340	12,752	
Summit Milk Yield 1st	60.0	54.3	47.4	46.6	
Summit Milk Yield 2nd	75.4	65.5	60.2	56.8	
Summit Milk Yield 3rd	84.0	71.5	65.0	52.8	
Summit Milk Yield Avg.	72.6	64.1	59.4	54.0	
Income/Feed Cost	1,912	1,658	1,321	1,223	
SCC Average	340	316	325	335	
Days to 1st Service	85	73	84	92	
Days Open	166	181	174	200	
Projected Calving Interval	14.6	15.1	14.9	15.8	
Guernsey					
Rolling Herd Average	15,378	14,152	13,530	11,558	
Summit Milk Yield 1st	54.0	51.0	50.0	44.0	
Summit Milk Yield 2nd	64.0	61.5	56.0	58.0	
Summit Milk Yield 3rd	67.0	64.5	61.0	62.5	
Summit Milk Yield Avg.	61.0	58.0	57.0	54.0	
Income/Feed Cost	1,796	1,146	1,670	1,248	
SCC Average	181	225	375	292	
Days to 1st Service	87	109	60	86	
Days Open	162	176	136	203	
Projected Calving Interval	14.5	15.0	13.7	15.9	
Holstein					
Rolling Herd Average	22,600	19,708	17,567	14,250	
Summit Milk Yield 1st	72.1	65.2	59.0	50.8	
Summit Milk Yield 2nd	91.9	82.6	71.9	61.7	
Summit Milk Yield 3rd	97.5	87.1	78.8	67.7	
Summit Milk Yield Avg.	85.5	77.5	70.6	61.1	
Income/Feed Cost	2,193	1,818	1,603	1,238	
SCC Average	342	369	403	498	
Days to 1st Service	87	89	92	80	
Days Open	168	166	176	200	
Projected Calving Interval	14.7	14.7	15.0	15.8	
Jersey					
Rolling Herd Average	16,641	14,245	12,403	10,047	
Summit Milk Yield 1st	46.2	42.4	46.2	35.4	
Summit Milk Yield 2nd	64.3	50.8	50.8	41.3	
Summit Milk Yield 3rd	73.1	61.7	55.0	46.0	
Summit Milk Yield Avg.	64.5	55.9	50.7	41.4	
Income/Feed Cost	1,804	1,717	1,247	941	
SCC Average	320	271	371	526	
Days to 1st Service	78	94	62	68	
Days Open	141	132	150	146	
Projected Calving Interval	13.8	13.5	14.1	14.0	
Milking Shorthorn					
Rolling Herd Average	14,909	14,025	13,427	11,156	
Summit Milk Yield 1st	51.0	54.0	45.0	45.5	
Summit Milk Yield 2nd	51.0	67.0	56.0	53.5	
Summit Milk Yield 3rd	86.0	81.0	70.0	64.5	
Summit Milk Yield Avg.	61.0	65.0	57.0	56.0	
Income/Feed Cost	1,525	1,565	1,625	781	
SCC Average	139	320	289	230	
Days to 1st Service	93	71	81	55	
Days Open	118	115	129	114	
Projected Calving Interval	13.1	13.0	13.4	12.9	

Hay Prices*—Kansas

	Location	Quality	Price ($/ton)
Alfalfa	Southwestern Kansas	Supreme	95–105
Alfalfa	Southwestern Kansas	Premium	65–90
Alfalfa	Southwestern Kansas	Good	—
Alfalfa	South Central Kansas	Supreme	95–100
Alfalfa	South Central Kansas	Premium	75–90
Alfalfa	South Central Kansas	Good	65–75
Alfalfa	Southeastern Kansas	Supreme	90–95
Alfalfa	Southeastern Kansas	Premium	80–90
Alfalfa	Southeastern Kansas	Good	65–75
Alfalfa	Northwestern Kansas	Supreme	50 cents/pt RFV
Alfalfa	Northwestern Kansas	Premium	80–90
Alfalfa	Northwestern Kansas	Good	70–75
Alfalfa	North Central Kansas	Supreme	50 cents/pt RFV
Alfalfa	North Central Kansas	Premium	65–90
Alfalfa	North Central Kansas	Good	60–70

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, *September 7, 1999*

Hay Prices—Oklahoma

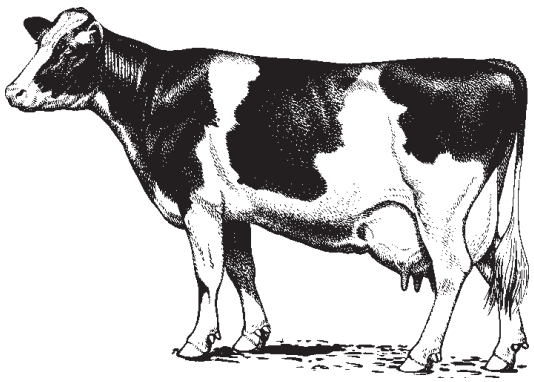
	Location	Quality	Price ($/ton)
Alfalfa	Central/Western, OK	Premium	85–100
Alfalfa	Central/Western, OK	Good	75–85
Alfalfa	Panhandle, OK	Premium	80–90
Alfalfa	Panhandle, OK	Good	70–95

Source: Oklahoma Department of Agriculture, *August, 1999*

Feed Stuffs Prices

	Location	Price ($/ton)
Blood Meal	Texas Panhandle	275–285
Corn Gluten Feed	Kansas City	60–63
Corn Gluten Meal	Kansas City	250–260
Corn Hominy	Kansas City	61–65
Cotton Seed Meal	Kansas City	118–121
Whole Cotton Seed	Memphis	110
Distillers Grains	Central Illinois	83–88
Pork Meat and Bone Meal	Texas Panhandle	145
SBM 48%	Kansas City	136–142
Wheat Middlings	Kansas City	40–44

Source: USDA Feedstuff Market Review, *September 1, 1999*



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cows should be housed in a loose housing pen for 10 days. Provisions must be made to segregate non-salable milk. Careful attention to intake, milk production, health, and cow comfort is necessary for cattle in this pen to prosper. The sick pen should handle 2% of the healthy lactating cows. Removal of the sick cattle from the healthy pens is necessary for efficient treatment, to prevent antibiotic contamination of milk, and increase cow comfort. It is recommended the fresh and sick pens be sand bedded loose housing regardless of housing type to maximize cow comfort. Lame and slow milking cows are often housed in the same pen and located close to the milking parlor. Removing slow moving or slow milking cows from the other pens will increase parlor efficiency 8 to 10%. Lame and slow milking cows will be about 2% of the healthy lactating cows and can be housed in freestalls.

On large dairies, non-lactating cattle should be divided into 5 groups defined as maternity, over-conditioned dry cows, under-conditioned dry cows, close up dry cows, and close up heifers. Nutritional needs of these groups vary greatly and grouping of these heifers and cows according to nutritional requirements is critical to minimize metabolic problems associated with calving. Ideally, cows calve in individual maternity pens. Close attention to close up pens allows cows that are just beginning the calving process to be moved to the calving pens. Cows normally stay in the maternity pen less than 24 hours. The number of maternity pens needed is approximately equal to .33% of the total milking cows. Dry cows and springing heifers differ in nutritional requirements. Dry cows have greater intakes and are much more likely to develop milk fever than heifers. Springing heifers may also benefit from a longer transition period than normally allowed for cows. Thus, heifers and dry cows should be separated.

Dry cows, more than 21 days from calving, should be separated into two groups, based on body condition. Cows lacking adequate body condition benefit from additional energy during the dry period, while feeding extra energy to adequately conditioned cows may be detrimental. Dry cows within 21 days of calving should be moved to a close up pen. The diet in this pen should have greater concentrations of protein and energy as compared to the other dry cow diet. In addition, the diet should be low in calcium and potassium or contain anionic salts with appropriate amounts of calcium and potassium to prevent milk fever. Milk fever is generally not a problem with heifers but heifers may benefit from receiving the typical transition diet for 5 weeks rather than 3 weeks. Thus, feeding a diet fortified with protein and energy without anionic salts for 5 weeks prior to freshening would be beneficial for heifers.

Table 1 contains several grouping examples utilizing the guidelines listed above. Utilization of these guidelines will prevent many of the bottlenecks encountered when dairy facility designs fail to correctly accommodate the management needs of the cow herd. Correct sizing of pens will increase production and labor efficiency on dairy farms. ■

Table 1. Group sizes of Dairy Facilities with Different Parlor Sizes*

		Milk Parlor Size				
		Double				
	Approx. % of Milk Herd	10	20	30	40	50
Steady state throughput**		90	180	270	360	450
Total lactating cows	**100**	**600**	**1,200**	**1,800**	**2,400**	**3,000**
Milking group size***		70	140	210	280	350
Healthy lactating cows	92	560	1,120	1,680	2,240	2,800
Sick cows****	2	10	20	35	45	60
Fresh	4	20	40	70	90	120
Slow milkers & lame cows	2	10	20	35	45	60
Maternity	0.33	2	4	6	8	10
Dry cows & heifers	**25**	**150**	**300**	**450**	**600**	**750**
Freshened cows per year	115	690	1,380	2,070	2,760	3,450
Over-conditioned dry cows	5	30	60	90	120	150
Under-conditioned dry cows	5	30	60	90	120	150
Close-up dry cows	5	30	60	90	120	150
Close-up heifers	5	30	60	90	120	150
Close-up— overflow pen	5	30	60	90	120	150

* Design based on 3× milking, 6.5 hours of steady throughput, 1.5 hours for parlor turn time (maintenance, clean up, etc).

** Milk parlor performance is based on steady state throughput at 4.5 turns per hour.

*** Milk groups based on 8 groups of cows with a milking time per group of 45 minutes and rounded to accommodate the parlor.

**** Assumes the sick, fresh, slow milkers and lame cows will be milked in same parlor during 1.5 hour turn around period.

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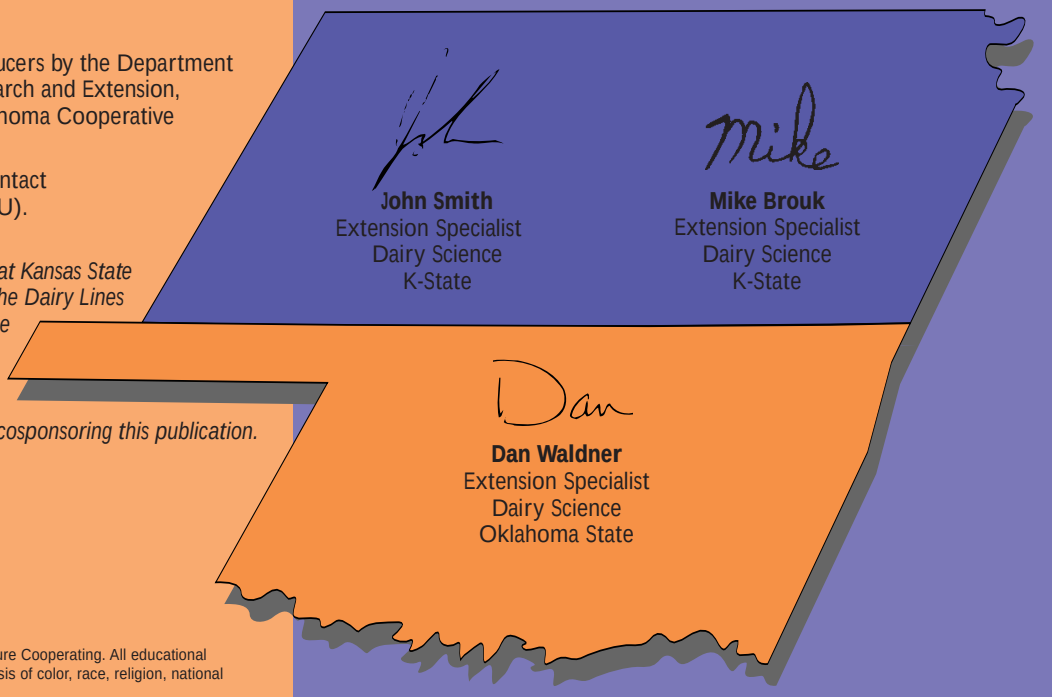

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