November 1996

# Dairy Lines

Volume 2, Number 11

KANSAS DAIRY EXTENSION NEWS

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

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## Upcoming Events

**Area DHIA Meetings**
Jan. 29–Feb 7, 1997
Locations to be announced next month



# Planning Milking Facilities for Dairy Expansion

***by J.F. Smith***

## Introduction

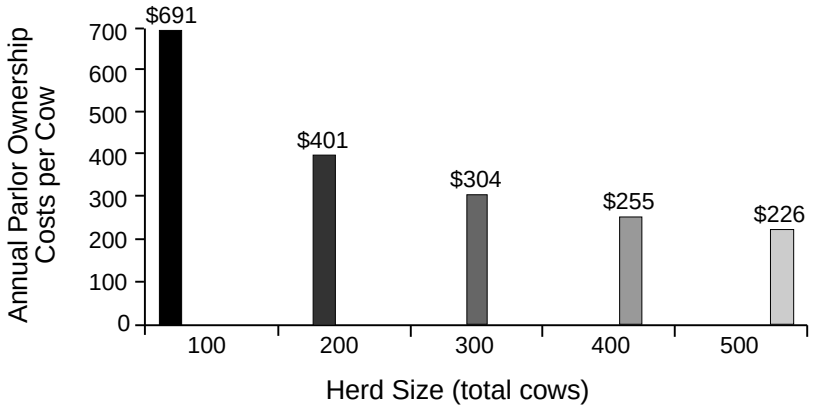
Many dairy operators are considering expansion of existing facilities or construction of new facilities to increase efficiency or profitability.

In many dairy operations, the maximum herd size is determined by the daily capacity of the milking center or the land available for manure disposal.

Constructing or remodeling a milking center is an important business decision that will have an impact on the volume and profitability of the dairy operation for many years. The milking center is the single most expensive facility in a dairy operation. Many large dairies will operate the milking parlor 18 to 20 hours per day to maximize their return on investment. Annual parlor cost per cow is reduced as herd size is increased (see Figure 1). Annual parlor ownership cost per cow decreases from $691/cow to $226/cow as herd size is increased from 100 to 500 cows. Dairy owners or managers should plan expansion of the operation very carefully. It may be more economical to use hired labor and use the existing milking parlor during more

*Continued on page 3*

Effect of herd size on annual ownership costs per cow for a double-8 herringbone.*




* *Source:* Craig Thomas, Michigan State University

## Heart of America Dairy Herd Improvement Summary (October)

| | Quartiles | | | | Your Herd |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | |
| Guernsey | | | | | |
| Rolling Herd Average | 16,402 | 13,884 | 12,689 | 10,611 | |
| Summit Milk Yield 1st | 56.8 | 50.8 | 47.6 | 41.1 | |
| Summit Milk Yield 2nd | 67.9 | 61.4 | 56.7 | 47.1 | |
| Summit Milk Yield 3rd | 70.6 | 62.5 | 58.1 | 48.8 | |
| Summit Milk Yield Avg. | 64.5 | 58.2 | 53.3 | 45.6 | |
| Income/Feed Cost | 1,596 | 1,198 | 1,070 | 825 | |
| SCC 1st LACT | 151 | 148 | 247 | 403 | |
| SCC 2nd LACT | 164 | 243 | 255 | 425 | |
| SCC 3rd+ LACT | 427 | 329 | 357 | 633 | |
| SCC Average | 246 | 245 | 293 | 501 | |
| Days to 1st Service | 85 | 85 | 100 | 101 | |
| Days Open | 145 | 148 | 160 | 150 | |
| Projected Calving Interval | 431 | 434 | 446 | 435 | |
| Brown Swiss | | | | | |
| Rolling Herd Average | 15,039 | 13,513 | 12,614 | 10,876 | |
| Summit Milk Yield 1st | 53.6 | 48.4 | 48.4 | 46.1 | |
| Summit Milk Yield 2nd | 69.4 | 64.2 | 53.6 | 53.2 | |
| Summit Milk Yield 3rd | 74.5 | 67.6 | 65.2 | 61.5 | |
| Summit Milk Yield Avg. | 63.9 | 60.9 | 57.1 | 53.8 | |
| Income/Feed Cost | 1,352 | 1,079 | 951 | 616 | |
| SCC 1st LACT | 187 | 155 | 121 | 316 | |
| SCC 2nd LACT | 208 | 144 | 221 | 235 | |
| SCC 3rd+ LACT | 250 | 325 | 160 | 210 | |
| SCC Average | 214 | 227 | 166 | 255 | |
| Days to 1st Service | 91 | 91 | 69 | 104 | |
| Days Open | 103 | 142 | 119 | 124 | |
| Projected Calving Interval | 385 | 424 | 399 | 406 | |
| Holstein | | | | | |
| Rolling Herd Average | 21,778 | 18,804 | 16,886 | 13,930 | |
| Summit Milk Yield 1st | 70.3 | 63.3 | 58.4 | 50.4 | |
| Summit Milk Yield 2nd | 90.1 | 80.0 | 72.8 | 61.1 | |
| Summit Milk Yield 3rd | 93.3 | 84.2 | 77.6 | 65.4 | |
| Summit Milk Yield Avg. | 83.5 | 75.4 | 69.7 | 59.6 | |
| Income/Feed Cost | 1,772 | 1,483 | 1,417 | 998 | |
| SCC 1st LACT | 218 | 227 | 229 | 281 | |
| SCC 2nd LACT | 244 | 263 | 283 | 342 | |
| SCC 3rd+ LACT | 391 | 407 | 427 | 552 | |
| SCC Average | 289 | 308 | 325 | 423 | |
| Days to 1st Service | 92 | 93 | 96 | 99 | |
| Days Open | 143 | 142 | 142 | 143 | |
| Projected Calving Interval | 423 | 421 | 422 | 422 | |
| Jersey | | | | | |
| Rolling Herd Average | 15,850 | 13,516 | 11,948 | 9,937 | |
| Summit Milk Yield 1st | 49.1 | 46.1 | 40.6 | 37.0 | |
| Summit Milk Yield 2nd | 62.3 | 56.4 | 49.4 | 43.3 | |
| Summit Milk Yield 3rd | 67.4 | 58.9 | 53.3 | 44.0 | |
| Summit Milk Yield Avg. | 60.0 | 54.2 | 49.2 | 41.7 | |
| Income/Feed Cost | 1,558 | 1,152 | 963 | 811 | |
| SCC 1st LACT | 178 | 246 | 217 | 336 | |
| SCC 2nd LACT | 214 | 272 | 251 | 412 | |
| SCC 3rd+ LACT | 337 | 449 | 464 | 558 | |
| SCC Average | 255 | 345 | 351 | 463 | |
| Days to 1st Service | 82 | 86 | 91 | 91 | |
| Days Open | 113 | 123 | 126 | 128 | |
| Projected Calving Interval | 392 | 401 | 405 | 407 | |

# Breed Effect on Titratable Acidity of Milk

***By Karen Schmidt & John Shirley***

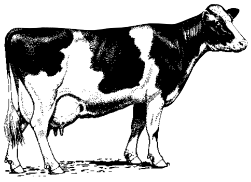
Titratable acidity (TA) of raw milk is affected by microbial content, protein content and age of the milk. The breed of cow may also affect titratable acidity because of variance in protein and fat content. Raw milk samples were collected from Ayrshires, Holsteins, and Guernseys to examine breed effects (Table 1).

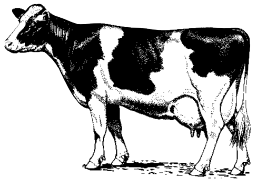
Guernsey milk clearly has the highest TA value and the highest milk protein and fat %. The Ayrshire breed was higher in milk protein (3.25%) compared to Holsteins (3.12) and showed a slightly higher TA value (.16 versus .15, respectively). It is interesting to note that the large difference in milk fat % between Ayrshires and Holsteins (3.9 versus 3.25, respectively) did not have a proportional affect on TA. Milk from the Guernsey cows had a higher total plate count than the other breeds and this, coupled with the higher milk protein % probably accounts for the elevated TA value.

These observations reinforce the fact that breed affects on TA are related to milk composition and quality. Acceptable TA value for dairy processing plants are normally based on milk from the Holstein breed because they account for the majority of the milk produced in the United States.

**Table 1.** Average titratable acidity (TA), total plate count (TPC), fat content, protein content, pH and somatic cell count (SCC) of milk from Ayrshire, Guernsey and Holstein cows.

| Breed | TA(%) | pH | Protein% | Fat% | SCC | TPC |
|---|---|---|---|---|---|---|
| Aryshire | .16 | 6.90 | 3.25 | 3.90 | 95 | 3,700 |
| Guernsey | .19 | 6.58 | 3.39 | 4.95 | 123 | 8,900 |
| Holstein | .15 | 6.90 | 3.12 | 3.25 | 143 | 1,700 |





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hours per day than to remodel or construct a new parlor and reduce milking time to 4 to 5 hours per day. Milking parlor capacity should be determined for present and future needs. If expansion is planned for the future, new facilities need to be designed with flexibility for future expansion in mind.

### Designing the Milking Center

Performance of milking parlors has been evaluated by time and motion studies to measure steady state throughput. However, this does not include time for cleaning the milking system, maintenance of equipment, effects of group changing, and milking the hospital string.

The performance of various types of milking parlors has been published, and parlor performance in the United States ranged from 25 to 401 cows per hour. Throughputs ranged from 84 to 401 cows per hour in parallel and from 60 to 205 cows per hour in herringbone parlors. Performance within a parlor type or size may vary because of milking frequency, detachers, wash pens, premilking hygiene, number of operators, and operator routine. Whether the milking facility has been remodeled or is new construction also can affect parlor performance.

Milking parlor size should be large enough to allow flexibility to incorporate premilking hygiene routines. Milking parlors should be sized to incorporate different milking frequencies so that all cows can be milked once in 8 hours when milking 2 × per day, once in 6.5 hours when milking 3 × per day, and once in 5 hours when milking 4 × per day. Using these criteria, the milking parlor will be sized to accommodate the necessary cleaning and maintenance.

Milking parlors need to be designed so that a group of cows can be milked in 30 to 60 minutes, depending on milking frequency. Observations on commercial dairy farms indicate that a group of cows should be milked in 60 minutes when milking 2 × per day, in 45 minutes when milking 3 × per day, and in 30 minutes when milking 4 × per day to ensure comfort by minimizing time that cows stand on concrete and are kept away from feed. Group size should be divisible by the number of stalls on one side of the milking parlor to maximize parlor efficiency.

Carefully planning the milking center in a dairy expansion can provide large returns on investment over the life of the facilities.

## Kansas Quality Milk Award Winners

***Small Herd Division***

1. ***Barbara and Don Kiehl, Pomona***
2. ***Lavern Figge, Onaga***
3. ***Jim and Nancy Sack, Baldwin***

***Medium Herd Division***

1. ***Gold Star Dairy, Spivey***
2. ***Doug Unruh, Walton***
3. ***John Unruh, Galva***

***Large Herd Division***

1. ***Sperfslage Dairy, Oneida***
2. ***John and Lovina Maxwell, Atwood***
3. ***Lehman Brothers, Sabetha***

## Hay Prices*

| | Location | Quality | Price ($/ton) |
|---|---|---|---|
| Alfalfa | Southwestern Kansas | Premium | 120–130 |
| Alfalfa | Southwestern Kansas | Good | 115–120 |
| Alfalfa | South Central Kansas | Premium | 100–110 |
| Alfalfa | South Central Kansas | Good | 90–100 |
| Alfalfa | Southeastern Kansas | Premium | 110–120 |
| Alfalfa | Southeastern Kansas | Good | 95–110 |
| Alfalfa | Northwestern Kansas | Premium | 110–115 |
| Alfalfa | Northwestern Kansas | Good | 80–90 |
| Alfalfa | North Central Kansas | Premium | 90–120 |
| Alfalfa | North Central Kansas | Good | 80–90 |

***Source:*** USDA Weekly Hay Report, *Week ending November 8, 1996*

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

## Feed Stuffs Prices

| | Location | Price ($/ton) |
|---|---|---|
| SBM 48% | Kansas City | 235.90–236.90 |
| Cotton Seed Meal | Kansas City | 204–205 |
| Whole Cottonseed | Memphis | 130 |
| Meat and Bone Meal | Central United States | 255–260 |
| Blood Meal | Central United States | 550 |
| Corn Hominy | Kansas City | 109–110 |
| Corn Gluten Feed | Kansas City | 95–100 |
| Corn Gluten Meal 60% | Kansas City | 345–355 |
| Distillers Dried Grain | Central Illinois | 133–136 |
| Brewers Dried Grain | St. Louis | 134–140 |
| Wheat Middlings | Kansas City | 87–90 |

***Source:*** USDA Weekly Feed Stuffs Report, *Week ending November 6, 1996*

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U.S. POSTAGE
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Permit #525
Manhattan, Kan. 66502

Dairy Lines is published for dairy producers by the Department of Animal Sciences and Industry, Cooperative Extension Service, Kansas State University.

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