AgriLIFE EXTENSION
Texas A&M System

L-5195
3-98

It is vital for dairy producers to evaluate overall herd performance regularly and look for inefficiency.

Tracking dairy efficiency

Sandra R. Stokes*

Culling practices, milk quality and feed rations can affect production efficiency

Many factors can reduce a dairy operation's profit margin. Although managing cows, crops and the manure system every day leaves little time for long-term planning, it is critical for dairy producers to make time regularly to review the overall operation and look for inefficiency. Production efficiency can be improved through changes in culling practices, reproductive efficiency, milk quality and feed rations.

Culling reasons, rates

Which are the profitable cows and which should be considered for culling?

***Extension dairy specialist; The Texas A&M University System**

There are two types of culling practices: voluntary and involuntary. Involuntary culling decisions result from health, reproductive or management problems. Voluntary culling decisions are made for production goals. Ideally, the decision to cull should be voluntary, which allows the greatest advances in herd average and expression of genetic potential.

However, far too many culling decisions are involuntary. A National Animal Health Monitoring Service survey of 2,500 dairies in 20 states found that more than half of all cows were culled for two reasons: reproduction and mastitis (Table 1). Culling for low milk production came in a close third.

Delayed breeding programs, using bST, may improve cows' energy balance and uterine health, extend herd life and reduce culling rates

REASONS FOR CULLING

Table 1. Survey results of culling procedures. Percentage of 2,500 dairies reporting various reasons for culling decisions.

REASON	PERCENTAGE
Reproduction	26.7%
Udder/mastitis	26.5%
Low production	22.4%
Lameness/injury	15.0%
Disease	4.3%
Aggressive/belligerent	1.0%
Other	4.1%

National Animal Health Service, 1996.

Reproductive efficiency

What is the current herd calving interval?

Is this by management choice or because of herd reproductive inefficiency?

Reproductive efficiency is critical in dairy production. Number of days open, days dry, season of calving and parity can affect milk production as well as income over feed cost (IOFC).

Researchers have studied and argued extensively the effects of open and dry periods on milk production and IOFC, but no consensus has been reached on the optimum number of days open. University of Wisconsin researchers reported that increases in both average days open and calving interval are associated with high milk yields (Hageman et al., 1991). In contrast, University of Nebraska (Jagannatha et al., 1995) researchers found the optimum open period to be the same across production levels. However, when evaluated for IOFC, this same group reported that low-producing cows required slightly fewer days open to maximize IOFC compared to average- and higher-producing cows. Regardless of days open, most studies agree that the optimum dry period is 51 to 60 days.

The use of bovine somatropin (bST) may make extended calving intervals more practical. Delayed breeding programs, using bST, may improve cows' energy balance and uterine health, extend herd life and reduce culling rates.

Cornell University researchers have begun a 4-year study comparing 13.2- and 16.5-month calving intervals. Preliminary results (data from the first $2^1/_2$ years) show that with the longer calving interval:

- Herds average a higher percentage of days in milk and fewer days dry.
- The annual culling rate may be reduced.
- Cattle may be healthier.
- Herd life may be extended.

Using the preliminary data, the researchers projected that an 18-month calving interval may raise profits by $274 per cow per year of life. The increase would result largely from extended herd life, higher milk IOFC and reduced heifer costs per cow being replaced over a longer time. This management plan is expected to work best in well-managed, high-producing herds.

However, remember: The data are preliminary. The commercial feasibility of this practice is much debated. Producers considering extending their herd's calving interval should take into account its current production level, lactation persistency and reproductive efficiency.

Milk quality

What does herd somatic cell count (SCC) cost in milk income?

Milk quality can affect milk income. Money can be lost through lowered milk production and from potential milk quality premiums.

The biggest overall financial loss from milk production is caused by subclinical mastitis, the most prevalent and hardest to detect form of mastitis. Producers cannot ship milk that has a somatic cell count (SCC) of 750,000 or greater. Research suggests that a cow with an SCC of 100,000 or less does not have subclinical mastitis. While a bulk tank SCC level of 100,000 does not lower production, up to 6 percent of udder quarters could be infected subclinically. Research estimates that an SCC of 200,000 per cow can mean the loss of 400 pounds of milk per cow per lactation in second-lactation and older cows (Table 2).

Quality premiums are easily calculated by multiplying pounds shipped by quality premium paid at goal. Target areas to evaluate include:

- Milking procedure;
- Washing procedure;
- Loafing environment.

PRODUCTION LOSSES FROM SCC

Table 2. Somatic cell count effects on milk production.

	ESTIMATED MILK LOSS	
SOMATIC CELL COUNT (1,000)	DAILY LOSS, #/COW	LACTATION LOSS, #/COW
72 - 141	1.5	400
142 - 283	3.0	800
284 - 565	4.5	1,200
566 - 1,130	6.0	1,600
1,131 - 2,262	7.5	2,000
2,263 - 4,523	9.0	2,400
4,524 - 9,045	10.5	2,800

Leo Timms, Iowa State University

Feed costs

What is your herd's average feed cost per cow per day?

What is the feed cost per cow per day of the production groups?

What is the herd average feed cost per cwt of milk?

Dairy producers can significantly affect cow performance and feed costs by choosing the proper ration ingredients and grouping cows according to size, production, lactation stage and gestation.

Forages: High-quality forages are the foundation of balancing animal health and performance in dairy cows. Whether home-grown or purchased, quality forages are an investment because they dictate a dairy's supplement program and drive its ration performance. A key indicator of forage quality is the cow's intake potential, which can be reduced by forage fiber content. As a plant matures, its fiber increases and its protein, digestibility and energy content decline (Table 3).

Herd grouping: Grouping cows offers advantages in management, nutrition and finances. It allows more accurate nutritional formulation and a more focused management of breeding groups. A disadvantage is that the producer must physically move cows from one group to another. However, evidence suggests that when cows are fed according to production, IOFC is higher. High-producing herds may warrant as many as three rations to avoid drastic dietary changes between groups.

Cows not grouped are usually fed rations formulated for the higher-producing cows, which overfeeds those in mid- and late-lactation. Nutritionally and economically, cows in mid-lactation do not warrant expensive bypass protein or fat supplementation. Producers can reduce feed costs significantly by using lower-quality ingredients for the middle and tail-end strings, which allows the more expensive ingredients to be fed to the fresh, high-producing cows.

Table 4 shows the differences in feed costs per group in a herd averaging 70 pounds of milk per day. Feed costs per cow per day for the herd fed in one group is listed at $3.62, compared with $3.40 for the same herd fed in two groups (high groups average 80 pounds of milk; low groups, 60 pounds). Cost per cwt of milk for single group is $5.17; for two groups, $5.00. Average feed costs (herd basis) are based on 40:60 split of cows in the high and low groups. The example illustrates how producers can feed more-expensive ingredients to high-producing cows and still yield economic herd feed costs, both daily and averaged per cwt of milk.

FORAGE QUALITY

Table 3. Effect of plant maturity on forage sorghum quality.

NUTRIENT	MID-VEGETATIVE	LATE VEGETATIVE	BOOT	BLOOM	HARD DOUGH
Total available carbohydrate, %	11.9	11.4	10.7	12.2	16.6
Crude protein, %	17.0	13.6	10.9	9.4	6.6
Neutral detergent fiber, %	59.5	63.6	67.4	65.0	61.0
In vitro dry material digestibility, %	70.5	65.0	62.9	63.5	54.2

McCormick et al. 1995. Louisiana Agricultural Experiment Station, Franklinton, La.

High-quality forages are the foundation of balancing animal health and performance

FEED COSTS BY GROUPS

Table 4. Estimated feed costs with one or two feeding groups.

	COST/COW/DAY		COST/CWT/DAY	
SCHEME	PER GROUP	HERD AVE	PER GROUP	HERD AVE
1 group	$3.62	$3.62	$5.17	$5.17
2 groups		$3.40		$5.00
High	$3.96		$4.95	
Low	$3.02		$5.03	

Feed additives: Becase feed additives cost money, producers must consider their purpose and payback in the ration. A few of these in the ration can add up quickly, so make sure they are fed to the right group (Table 5).

Summary

- As economics pushes producers to become more efficient, it becomes more vital to evaluate herd performance regularly.
- The best reason to cull is for low production. More than 50 percent of dairy cows are culled for involuntary reasons (reproduction and udder health).
- Reproductive efficiency affects income over feed costs.
- High somatic counts lower milk production.
- Feed management decisions such as forage quality and cow grouping affect ration performance and income over feed costs.

The best reason to cull is for low production

FEED ADDITIVES

Table 5. Use of feed additives in dairy rations.

ADDITIVE	USE/BENEFITS	CONDITIONS*
Anionic salts	Prevent milk fever, increase milk, improve repro	8
Buffers	Increase DMI, milk production, raise milkfat	1, 2, 3, 5, 7
Fats	Increase milk, raise milk fat, improve repro	1
Niacin	Increase milk, reduce ketosis, raise milk protein	1, 6
Probiotics	Reduce digestive upsets, increase milk	1, 2, 5
Yeast culture	Increase milk, reduce digestive upsets	1, 2, 5, 7
Zn-methionine	Increase milk, reduce SCC, reduce foot problems	1, 4

*Conditions under which the additive is most likely to help:

1 = early lactation, high production
2 = high concentrate, low-fiber diets
3 = high corn silage, wet diets
4 = high SCC herds
5 = digestive upsets and "off-feeds"
6 = good to excess body condition
7 = heat stress
8 = two weeks prepartum, high calcium diets

Produced by AgriLife Communications, The Texas A&M University System

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Edward A. Hiler, Interim Director, Texas Agricultural Extension Service, The Texas A&M University System.
1,000 Copies, Revised DS