BALANCED DAIRYING
-Production-

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FEEDING THE TRANSITION COW

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Proper nutrition management during the transition period is critical to successful lactation. The transition period extends from the last three weeks of gestation (close-up dry period) through the first two weeks of lactation (early fresh period). During this time, the cow goes from a low-maintenance phase to a high-performance period in her productive life.

The goal is to achieve peak milk production 5-6 weeks after calving, with high peak yield and continued good milk production. Theoretically, for every one pound of extra peak milk yield, total milk production increases approximately 250 pounds during lactation. In both the close-up dry cow and the fresh cow, knowing the intakes makes it possible to accurately formulate rations for optimum milk production.

The Close Up Dry Cow. Feed intake usually decreases in the final week before calving, sometimes as much as 35 percent. At the same time intake is decreasing, nutrient requirements increase because of the growing calf. Because of this, it is a good idea to separate the dry cows into two groups--the far-off dry cows (first 40 days after drying off) and the close-up dry cows (last 21 days before calving). Then a producer can increase the levels of energy and protein during the last three weeks prior to calving to ensure the cow is getting the needed pounds of protein, energy, and other nutrients during this critical time.

Consider nutrient profiles and feed ingredients in formulating close-up rations. Table 1 shows example nutrient profiles for close-up cows. Any ingredient included in the fresh cow ration should be introduced in the close-up ration. A rule of thumb is the half way point. For example: If the first group a cow goes into after calving is getting 6 pounds of cottonseed, she should get 3 pounds of cottonseed in the close-up period. The same concept applies for fermented feeds and fat products. The exception is buffers. They should **not** be fed any time during the dry period.

If fresh cows are having problems with milk fever or other metabolic problems, consider using an anionic salt program in the close-up dry cow ration. Adopt the same strategy when available forages for the dry cows are high in calcium, phosphorus and/or potassium. Anionic salts are fed to manipulate the dietary cation/anion balance in the close-up cow. These salts lower body pH and stimulate calcium release from the bones and calcium absorption from the gut. However, these salts are not very palatable and can further depress intakes, creating worse problems if not managed properly. When feeding anionic salts: (1) feed palatable rations (preferably in a total mixed ration),

TABLE 1. NUTRIENT GUIDELINES FOR TRANSITION RATIONS.

	Early Dry Cow	*Close Up Dry Cow (Transition Ration)*	Fresh Cow
Ne_l (Mcal/lb)	.60	***.68-.70***	.77
Crude protein, %	12	***15-16***	18
NDF, %	45-65	***35-40***	30
Nonfiber Carbohydrate, %	25	***30***	35

(2) know forage mineral levels, and (3) provide proper mineral supplements (calcium levels must be at least 150 grams per day to prevent body depletion before calving).

Anionic salts can cause udder edema in heifers and should not be fed to this group. Work with a nutritionist when implementing an anionic salt program.

The Fresh Cow. A well-managed dry cow with adequate body condition enters the fresh cow pen with minimal complications. Ideally, a fresh cow pen is simply a smaller pen where cows can be more closely monitored for metabolic problems and potential infections. Early fresh cows should have plenty of access to feedbunk and stall space to encourage appetite and overall health. This is not the group to crowd!

If the close-up dry cow ration is on target, the fresh cow rations will closely mirror the high cow ration. However, cows in the fresh pen may benefit from additional long hay and other ingredients such as yeast, probiotics, and/or chelated minerals. To avoid inducing metabolic problems (Table 2) when only moderate levels of energy and protein are fed in the ration just after calving don't leave cows in this pen too long.

A well-managed transition cow should have 85 to 90 percent of her peak appetite by two weeks after calving and be ready to leave the fresh pen.

TABLE 2. CAUSES AND PREVENTION FOR METABOLIC PROBLEMS.

Problem	Cause	Treatment	Prevention
Displaced abomasum	Ration change too fast	Rolling, surgery	Close-up dry cow and fresh cow ration management
Hardware	Ingestion of sharp object	Magnet on mixer/feeder wagon	Feed quality management program
Ketosis	Low energy intake	Dextrose IV, oral propylene glycol	Close-up dry cow and fresh cow ration management
Milk fever	Drop in blood calcium	Calcium gluconate IV	Close-up dry cow and fresh cow ration management Oral calcium gel at calving

Dairy 2000— Managing for Success

Michael A. Tomaszewski and Robert A. Schwart
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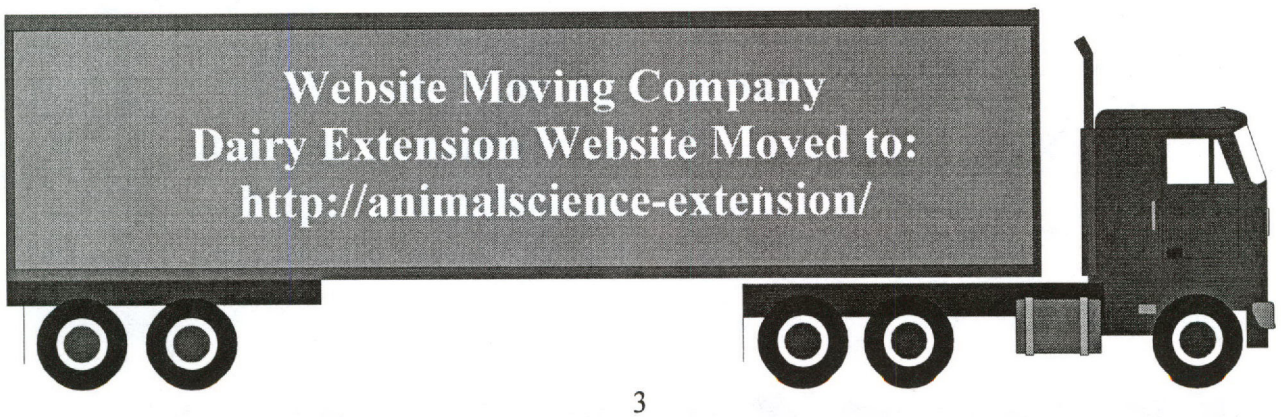
At the request of an East Texas producer/agribusiness group, *Dairy 2000, Managing for Success* was initiated jointly by the Departments of Agricultural Economics and Animal Science at Texas A&M. The mission of this program is to help Texas dairy producers improve basic business management skills. The program focuses on the five basic functions of management (planning, organizing, controlling, staffing, and directing), rather than technical production subject matter. *Dairy 2000, Managing for Success* neither substitutes for, nor competes with, technical education for dairy producers, but rather compliments technical training.

Producers requested the business management training to help them better manage the entire dairy business. Several states have similar programs. Under the leadership of Robert A. "Bud" Schwart, theses programs were adapted to the Texas situation. To date, thirty dairies have participated in three 18-hour workshops conducted in two counties in Northeast Texas. Four of those dairies participated in an advanced 12-hour financial management training program after completing the basic course.

Dairy 2000, Managing for Success training deals with key management concepts and applying them to a dairy situation. Setting goals for the dairy business, identifying problems, organizing resources and people, and regularly monitoring financial and production information are major steps in successfully managing a dairy business to ensure business health and survivability.

Basic managerial skills found in *Dairy 2000, Managing for Success* form the foundation for more advanced management workshops in finance, production, and marketing.

Success depends on the involvement of local producers, agribusiness people and county Extension agents. Producers in other counties interested in this type of training should contact their county Extension agent. No prior business management training is needed to take this training.



BE AWARE! SUMMER TIME ALSO MEANS HIGHER SCC COUNTS

Michael Tomaszewski, Extension Dairy Specialist

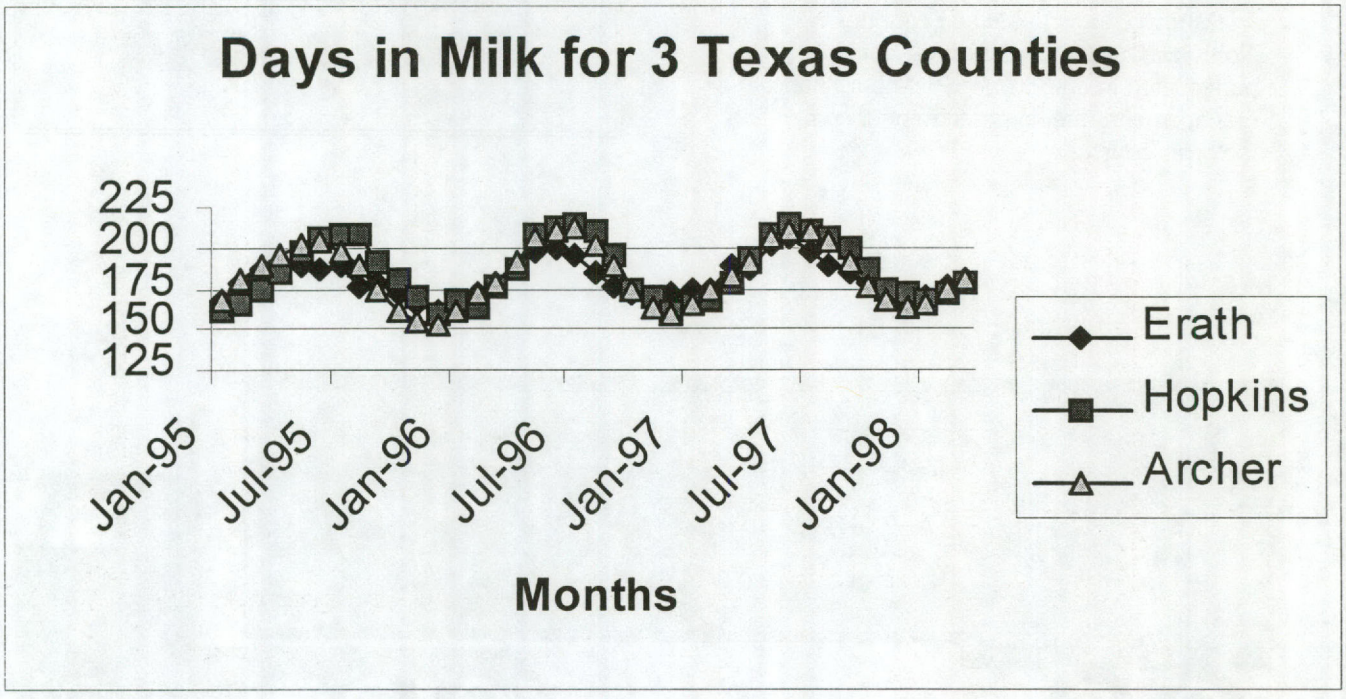
Texas summers bring many things. Some helpful and some not so welcome -- high temperature and humidity. Something else is also associated with our Texas summers--an increase in SCC cells. Elevated cell counts don't just happen. They are the immune system's defense to an infection. Once cured of infection, the count might go down. In the meantime, secretory tissue has been destroyed.

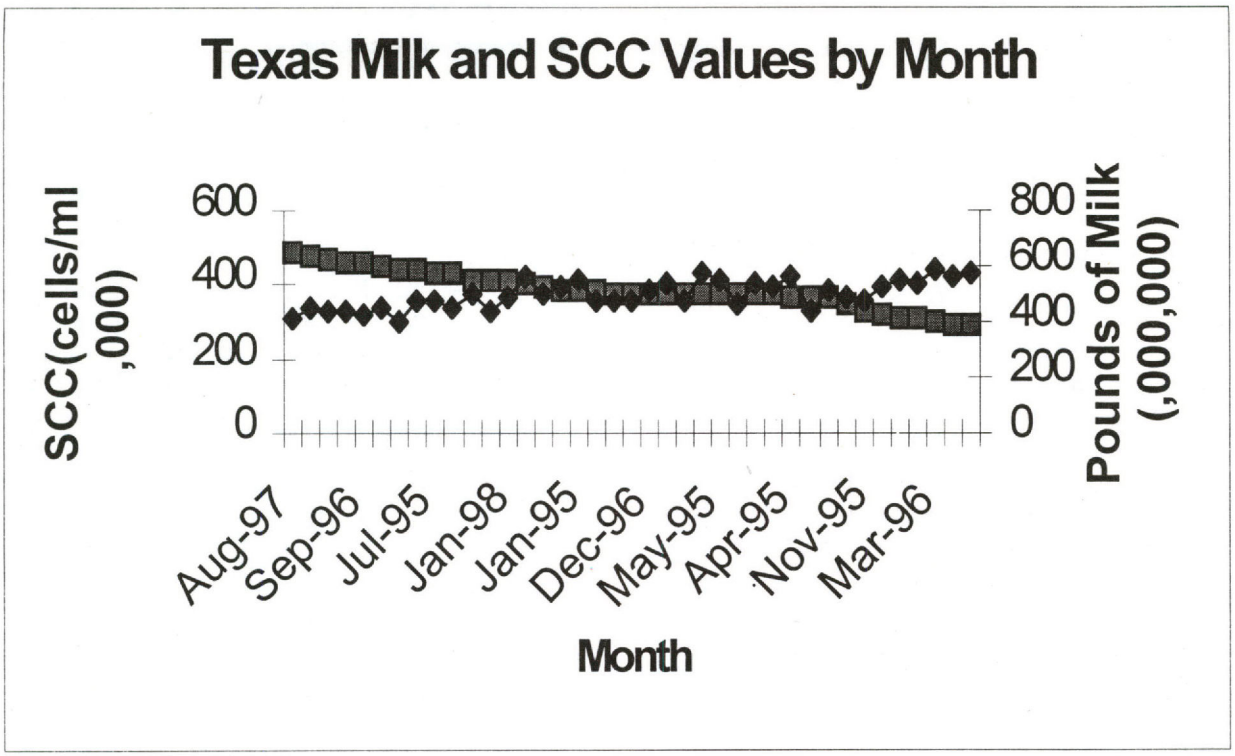
Graph 1 compares milk sold in the Texas order versus SCC values by month for the past three years. Not only did August and September have the least milk marketed in each year, but also the highest SCC values. March seems to have the highest milk and lowest SCC. Average SCC for the last three years for March was 347,000 cells/ml, while August was 468,000 cells/ml. That amounts to a 119,000 shift in cell counts. Increased SCC results in a lower milk price and decreased productive life of the cow.

This relationship might be expected. Most cows in August are in the later stages of their lactation. Longer days in milk are associated with higher SCC counts and lower levels of milk production. However, summer stress also brings on reduced intakes, decreasing production. Crowded and/or improperly-maintained shade areas become a reservoir for mastitis organism.

To determine if longer days in milk contributed to the higher SCC counts, I went to the DHI database. This database provides base line data from which to establish trends. Three large dairy counties were compared, Erath, Hopkins and Archer. The values in Graph 2 appear to indicate a seasonal fluctuation in days in milk. Erath County appears to fluctuate less than the other two counties. That indicates herds in Erath County tend to maintain a more even calving schedule.

Summer brings higher SCC. In managing for profitability, be ready with proactive versus reactive management. Prevention is the best mastitis treatment.





Tips to keep SCC down

- ✓ Cows have a tendency to eat less in warm weather. Maintain fresh feed.
- ✓ Feed appetizing nutrients to maintain dry matter intake.
- ✓ Keep cows comfortable and cool.
- ✓ Do not let lots become *wallow* holes. Cows have a tendency to group into a shaded area. Large numbers of cows in a small area create a potential bacterial storeroom. Maintain areas in good condition.
- ✓ Backfill areas under trees where cows congregate or fence them off and go to movable shades when herds are pastured.
- ✓ Make certain cows are not over milked. Lower levels of production mean less milking time.
- ✓ Provide CLEAN, fresh water to cows at all times.
- ✓ Watch and track potential high SCC cows. Use CMT, WMT or DHI somatic cell testing to identify potential problem cows in your herd.

UNDERSTANDING FORAGE QUALITY ANALYSIS

Sandra R. Stokes and Eric P. Prostko
Extension Dairy Specialist and Extension Agronomist

Many dairy producers in Texas don't have the land capacity to grow their own forages. Consequently, they rely on both local and out-of-state farmers for supplies. This gives Texas forage producers an excellent opportunity to expand their markets into the dairy industry.

To take advantage of this opportunity, both dairy and forage producers need more information about the terms associated with forage quality analysis. Understanding forage quality analysis improves the marketing relationship between dairy producers and forage growers. By collectively developing a suitable price for a forage crop, both parties benefit.

Methods of Forage Quality Analysis

Two methods are used to analyze forage samples in a laboratory. These include the traditional wet chemistry analysis and the newer, near-infrared reflectance spectroscopy (NIRS) analysis. Wet chemistry analysis, based upon well-established chemical principles, uses chemicals and drying agents to determine the components of a forage. NIRS analysis is a computerized analysis using near-infrared light to determine forage quality. Although NIRS analysis is faster and less costly, there is debate on the accuracy and interpretation of the analysis, particularly if a sample contains a mixture of forage species, or if the machines are not calibrated with the same species from the same area.

Forage Quality Parameters

While most dairy producers are familiar with detailed forage quality analysis. Many forage producers are not, primarily because they have traditionally been paid on the basis of tonnage produced. Understanding quality factors is a key to marketing forages to dairies. Forage quality indicators important to dairy producers include protein, ***neutral detergent fiber*** (NDF), ***acid detergent fiber*** (ADF), ***net energy for lactation*** (NE_ℓ), ***and relative feed value*** (RFV).

Protein. ***Crude protein*** (CP) can be a significant nutrient component of forages, particularly legumes. Unfortunately, many producers, both dairy and forage, use this value as a sole indicator of quality. Laboratories measure the nitrogen (N) content of a forage and calculate crude protein using the formula CP = %N x 6.25. Generally, forages harvested at early vegetative stages of growth have higher crude protein contents than more mature forages harvested at or later than flowering stages.

Fiber. Plant fiber consists of three components: cellulose, hemicellulose and lignin. The primary source of ration fiber comes from forages. As the fiber content increases its energy content generally decreases. The dairy cow needs a minimum amount of fiber to maintain good rumen function - stimulating cud chewing, rumen movement, and the production of saliva

Check Feed Purchases for Aflatoxin

for buffering. The forage variety and its stage of maturity at harvest influences the fiber content of the crop.

The traditional measure of energy content in feedstuffs was total digestible nutrient (TDN) content. However, this is a vague term and doesn't accurately describe the plant's available energy. Because a better indicator of energy was needed, a new system was developed for feedstuff analysis. The detergent analysis system separates the cell solubles (starch, protein, sugars) from the fibrous portion (structural support for the plant). The soluble portion provides most of the energy, while the fibrous portion may limit intake. The fibrous portion is separated into two components, NDF and ADF, which nutritionists use to formulate dairy rations more accurately.

Neutral detergent fiber measures all the fiber found in forage (hemicellulose, cellulose, lignin). The NDF fraction is partially digestible, depending on forage species and stage of maturity. Bulk density and NDF are directly related, so forage and ration NDF levels are used to predict feed intake. A high NDF content in forages not only decreases intake, but limits its effectiveness promoting high milk production.

Acid detergent fiber measures only the cellulose and lignin content in the plant. ADF is also partially digestible. Both animal and laboratory trials show that increasing ADF levels decreases fiber digestion. Because of this negative relationship between ADF and digestibility, low ADF is desirable. Factors increasing forage ADF content include increasing maturity, weathering, rain damage, high temperatures, and weeds.

Of the fiber fractions (hemicellulose, cellulose, lignin), cellulose is the major fiber fraction digested by the animal. However, lignin can bind up the cellulose fraction and lower digestibility. This is a concern with southern-grown forages, as high temperatures during the growing season increase plant lignification. The higher the concentration of lignin, the less digestible the fiber will be. For example, compare two forages having similar ADF contents (30%). Forage A has 25% cellulose and 5% lignin; while forage B has only 20% cellulose, but 10% lignin. Forage A, with the lower percentage of lignin, is more digestible and supports greater milk production.

Net Energy for Lactation. This calculated value estimates the energy available to support milk production. This calculation is based on a formula including the results of ADF analysis. Net energy is expressed in terms of megacalories per unit of feed. Different equations are used around the country, so be careful when comparing the NE_ℓ of feeds tested at different locations.

A number of factors must be considered to accurately evaluate forage quality. Analyze forages for CP, NDF, and ADF, as well as for mineral content. While each is used directly in formulating dairy rations, comparing forages for quality rank can be confusing.

Relative Feed Value is an index which combines digestibility and intake potential into one number. Developed for comparing forages on the basis of energy, the RFV ranks a forage relative to full bloom alfalfa (full bloom alfalfa is considered to have a RFV equal to 100). For example, a forage with a RFV of 120 contains 20% more energy than mature alfalfa. The digestibility and potential intake values are determined from ADF and NDF analysis. Previously, crude protein was also included. However, it has been removed from the equation because of its low correlation with digestibility and intake and its considerable variability. Also, protein is much more easily manipulated in the dairy ration than fiber digestibility.

Table 1. Hay grades and their relative feed values (RFV).

GRADE	*RFV*
Prime	>151
1	125-151
2	103-124
3	87-102
4	75-86
5	<75

Forages ranked by RFV are assigned a quality grade ranging from prime (highest) through grade 5 (lowest). Values for bermudagrass need to be used with caution, as a high RFV does not always equate to high levels of milk production. Also, be careful comparing values from different sources, as there are several different equations for calculating RFV.

Summary

Putting forage quality analysis into use with commercial dairy rations can be complicated. Many environmental and management factors affect forage quality. However, forage quality drives the feed supplementation program and the resulting milk production.

Forage quality should be determined only through analysis from a reputable laboratory. Important quality factors to consider include CP, NDF, and ADF. Both dairy and forage producers must understand forage quality analysis. Dairy producers must know the nutritional content of a particular forage crop to develop the best possible feeding strategies. Forage producers must understand forage quality analysis to grow forage they can sell to dairies. Table 2 summarizes the target nutrient parameters for common forages grown in Central Texas for dairy rations.

Table 2. Targeted nutrient content (dry matter basis) of selected forages for dairy rations.

Feed	CP,%	NDF,%	ADF,%
Alfalfa hay	20	40	30
Bermudagrass hay	14-16	65	30
Corn silage	8	51	28
Sorghum silage	6-8	63-69	33-38
Wheat silage	12	49-57	27-34

CALENDAR OF EVENTS

July 27-31	ADSA Conference, Denver, Colorado
September 15-16	TX Dairy & Farm Show, Stephenville, Texas Contact Sandy Stokes - (254) 965-3759
April 7-10, 1999	Western Dairy Conference, Las Vegas, Nevada Contact Alexis Park Hotel - (702) 796-3300

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