



DAIRY CONNECTION

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■ Editorial

Each of us must grapple every day with choosing what we value most in our lives. A group of students was asked to list what they thought were the present-day "Seven Wonders of the World." Though there were some disagreements, the following received the most votes:

1. Egypt's Great Pyramids
2. Taj Mahal
3. Grand Canyon
4. Panama Canal
5. Empire State Building
6. St. Peter's Basilica
7. China's Great Wall

While gathering the votes, the teacher noticed that one quiet student hadn't turned in her paper yet, so she asked the girl if she was having trouble with her list. The girl replied, "Yes, a little. I couldn't quite make up my mind because there were so many."

The teacher said, "Well, tell us what you have, and maybe we can help." The girl hesitated, then read, "I think the Seven Wonders of the World are: 1. to see, 2. to hear, 3. to touch, 4. to taste, 5. to feel, 6. to laugh, and 7. to love."

The room was so quiet you could have heard a pin drop. The things we take for granted or overlook as simple and ordinary are truly wondrous!

What is your vision for dairying in North Dakota? If you review the vision statement (not the mission statement), you begin to see the possibilities. Not literally, but figuratively, it represents what could be. The vision is about what is important, like seeing the growth represented by cattle utilizing the forage from green alfalfa pastures and expansion herds to 100,000 cows, the number projected for long-term stability of the state's dairy industry. Don't get lost in the numbers and what can't be done, rather, try to see the vision for a prosperous future.

To learn more, watch for Farm Yard Social 2004, coming soon to a dairy near you.

Regards,

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■ Forages

Better forage = more milk

To a major extent, the lower the fiber (less protein), the higher the digestibility of forage. The better the forage, the less grain and supplement required to balance the lactating cow's diet. Uniform, well-balanced diets make milk and milk pays the bills. So with forage harvest upon us, it's time to set a strategy for the first cutting.

Timing of the first cutting is crucial to the remaining cuttings. None of the cuttings are more difficult to time than the first. In the northern hemisphere, our rapid change in day length, which promotes fiber production, and the higher temperatures produce lignin, the woody, indigestible fiber. This combination of a greater day length and higher temperature makes the first cutting mature rapidly and results in a more fibrous, less digestible plant.

For quality alfalfa, begin cutting slightly before the recommended maturity to attain the largest proportion of your crop when it is right. This may mean parking the corn planter even though planting isn't quite done.

Grasses generally should be harvested at the late-boot to early-head stage. Grass quality drops off much more rapidly than alfalfa. Many people in the Northeast have been successful with early-harvested grass hay silage, cut in the vegetative stage at 30-day intervals, and containing 50 to 55 percent NDF. They harvest grassy fields before those with a lot of alfalfa.

Cut alfalfa at the mid- to late-bud stage when it contains 40 to 45 percent NDF. The NDF content of alfalfa has been shown to vary by as much as 10 percentage units from year to year when harvested on the same calendar day. Using "growing degree days" can help find the best time to cut alfalfa.

According to one Michigan State University study, for every one unit increase in NDF percentage over 40 percent NDF, there was a 0.69 unit drop in protein, a 0.84 unit decline in NDF digestibility, and a 0.83 unit hit in dry matter digestibility. This was estimated to have a subsequent cost of 5 cents per cow per day in additional grain needed and 6 cents per cow per day in lost milk. But it saved 1 cent per cow per day in lowered dry matter intake.

The final cost for every unit boost in NDF percentage was 10 cents per cow per day or \$33 per cow per year. The relationship between NDF and protein content, NDF digestibility and DM digestibility is good within a field and within a cutting, but the relationship is poor across cuttings and locations.

The more digestible the NDF, the quicker the rumen begins to feel empty after a cow eats, resulting in higher intake overall. Michigan State researchers found that increasing NDF digestibility by 1 percent pushed up dry matter intake by almost 0.40 pounds and boosted fat-corrected milk production by 0.55 pounds. Mature, highly lignified forage has a lower NDF digestibility.

Moisture going into the pile is critical

Regardless of the cutting, harvesting a quality product but storing it at the wrong moisture will destroy its value as a feed. Don't let your well-planned strategy be lost to inadequate storage. Dry matter (or moisture content) is critical to this process. There are two reasons for paying close attention to forage dry matter: quality and consistency. With wetter hay, the silage reaches the stable phase at a lower pH. So, higher moisture silage needs more

sugars for the lactic acid bacteria to grow to sufficiently lower pH. If available sugars run out before the silage reaches a low pH, the fermentation will stop, and the silage will be unstable.

Silages with less than 30 percent dry matter have a greater risk of being unstable and containing clostridia bacteria. Clostridia produce butyric acid and break down protein. They make the silage smell rancid. Clostridia growth results in higher silage losses, poor silage intakes and higher levels of silage ammonia that may be used poorly by the cow. Silage with high clostridia levels usually has a pH of 5.0-5.5 (rather than the normal pH of 4-4.5).

Silage that is too dry may heat more and have more mold problems because it doesn't pack well, allowing more oxygen to remain in it. So dry matter losses can be high. Generally, it is recommended that hay silage for a bunker be put up at 32 to 35 percent dry matter. Hay silage for bags, upright stave silos and oxygen-limiting silos can be put up drier.

Especially with TMR feeding, unaccounted changes in forage moisture content can cause big problems with ration consistency and milk production. With bunker silos, loads of hay silage are layered into the bunk. This generally helps to improve consistency when it is fed. But, the feeder must obtain hay silage evenly from the entire face of the bunk, and the person sampling the silage for analysis must do the same. This may sound simple, but often it is not. Many people who complain of fluctuating intakes and milk production find the problem often attributed to inconsistencies in the bunker silo.

Put it up right or lose your investment

The rule for bunkers is to pack more than 800 to 1,000 hour-pounds per ton of silage by using heavier tractors and more than one tractor. If you have 38,000 pounds of tractor weight, 38 to 48 tons can be delivered per hour. Pack each incoming load right away! This will increase the density of the silage, prevent mold growth and improve milk production. There can be as much as a 10 degree to 20 degree reduction in heating if silage is packed properly.

Leaving a bunker uncovered is equal to using 30 percent of the top three feet of silage as silo cover. This silage either must be forked off later, or, if fed, it could do cows more harm than good. Sealing the bunk has been estimated to have a 4:1 return on investment with hay silage and a 2:1 return on investment with corn silage.

Silos should be covered as soon as possible with plastic. Tires on top should be touching each other.

Many farmers now are finding that it pays to get a custom operator to put up forage for them. It allows them to focus more on their cows, they get better quality forage, they have less machinery investment and they have less labor headaches. If you struggle with hay silage quality every year and your machinery is breaking down, now might be the time to at least get out your calculator and evaluate your options.

New forage publications at an Extension office near you

I have recently prepared a series of publications on forage quality that will be available soon at your local office of the NDSU Extension Service.

- AS-1250, "Quality Forage – Forage Nutrition for Ruminants."
- AS-1251, "Quality Forage – Interpreting Composition and Determining Market Value."
- AS-1252, "Quality Forage – Haylage and Other Fermented Forages."
- AS-1253, "Quality Forage – Corn Silage Management."
- AS-1254, "Quality Forage – Silage Fermentation and Preservation."
- AS-1255, "Quality Forage – Storage, Sampling and Measuring."
- AS-1256, "Quality Forage – Stressed Damaged Crops."

■ Nutrition

Minerals — are they important?

Minerals are inorganic (not of plant or animal origin) elements required by the body for optimum growth and proper muscle and nerve function. In addition, they are essential components of body enzymes, hormones and body cells. Recommended mineral levels are not constant throughout the life of an animal. In fact, they vary with changing production, body size, environment and other dietary factors.

Macrominerals are needed in higher amounts and are usually expressed as a percentage of the ration dry matter. Calcium, phosphorus, sodium, chloride, potassium, magnesium and sulfur are macrominerals that are important to the dairy cow. Microminerals are needed in smaller amounts and are generally expressed as parts per million (ppm). Iodine, zinc, iron, copper, molybdenum, fluorine, cobalt, selenium and chromium are microminerals needed by the dairy cow. The following table lists these minerals, their functions, symptoms of deficiency and feed sources used to supply each respective mineral.

Summary of minerals in dairy rations

Mineral	Functions	Deficiency symptoms and associated problems	Feed sources for dairy cattle
Calcium (Ca)	Bone and teeth formation; blood clotting; muscle contraction; 12 percent in whole milk	Rickets; slow growth and and poor bone development; easily fractured bones; reduced milk yield	Alfalfa and other legumes; ground limestone; dicalcium phosphate; steamed bone meal
Phosphorus (P)	Bone and teeth formation; involved in energy metabolism; part of DNA and RNA; .09 percent in milk	Fragile bones; poor growth; low blood phosphorus; depraved appetite; poor reproductive performance	Phosphates; steamed bone meal, cereal grains; grain by-products; oil seed meal
Sodium (Na)	Acid-base balance; muscle contraction, nerve transmission	Craving for salt; reduced appetite; incoordination, weakness, shivering	Common salt and buffer products
Magnesium (Mg)	Enzyme activator; found in skeletal tissue and bone	Irritability; tetany; increased excitability	Magnesium oxide; forages and mineral supplements
Sulfur (S)	Rumen microbial protein synthesis; found in cartilage, tendons and acids	Slow growth; reduced milk production; reduced feed efficiency	Elemental sulfur; sodium and potassium sulfates; legume forages
Potassium (K)	Maintenance of electrolyte balance; enzyme activator, muscle/nerve function	Decrease in feed intake; loss of hair glossiness; lower blood potassium	Legume forages; potassium chloride; potassium sulfate
Iodine (I)	Synthesis of thyroxine	Big neck in calves; goitrogenic substances may cause deficiency	Iodized salt; trace mineralized salt; ethylene diamine dihydroiodide
Iron (Fe)	Part of hemoglobin; part of many enzyme systems	Nutritional anemia	Forages; grains; trace mineralized salt and commercial supplements
Copper (Cu)	Needed for manufacture of hemoglobin; coenzyme	Severe diarrhea; abnormal appetite; poor growth; coarse, bleached hair coat	Trace mineralized salt and commercial supplements
Cobalt (Co)	Part of vitamin B12; needed for growth of rumen microorganisms	Failure of appetite; anemia; decreased milk production; rough hair coat	Trace mineralized salt and commercial supplements
Manganese (Mn)	Growth; bone formation; enzyme activator	Delayed or decreased signs of estrus; poor conception	Traced mineralized salt and commercial supplements
Zinc (Zn)	Enzyme activator; wound healing	Decreased weight gains; lowered feed efficiency; skin/wound problems	Forages; trace mineralized salt; zinc methionine
Flourine (F)	Not known if it is essential for ruminants, although essential for lab animals	Severe reduction in feed intake; stiffness in legs enlarged bones	Rock phosphate mineral
Selenium (Se)	Functions with certain enzymes; associated with vitamin E; immune system	White muscle disease; retained placenta; lessens subclinical mastitis	Oil meals; alfalfa; wheat; oats; corn; commercial supplements
Molybdenum (Mo)	Part of the enzyme xanthine oxidase	Loss of weight; emaciation; diarrhea	Widely distributed in feeds; deficiency rarely a problem

Adapted from Feeding the Dairy Herd, NCR Extension Publication 346

Manage TMRs for better feed efficiency

Total mixed rations (TMRs) can increase feed efficiency in dairy herds, but must be properly managed. Some of the most common TMR management errors include feeding a partial TMR, trying to mix in too much hay, feeding batches that are too small, or trying to exceed the mixer's capacity.

TMR should have 8 to 10 percent coarse particles. Studies have shown that mixing the TMR for longer than 15 minutes can reduce the amount of coarse particles to less than 5 percent of the ration. Five minutes of actual mixing time is usually enough.

All ration components should be analyzed for moisture, crude protein and energy content. Something that might seem inconsequential can have a big impact on production. For example, a mistake of just four percentage points in the moisture content of corn silage can cost up to 3.5 lbs/cow/day in milk production.

Moisture content is crucial. A TMR should contain roughly 50 percent moisture. It can be increased by adding water or including moist feeds such as silage or wet distillers grain. Avoid producing a TMR that's prone to sorting. Three options for combating sorting problems are: process corn silage as it's chopped, add less and/or higher-quality hay to the mix, or add liquid molasses.

A Garcia, SDSU Extension Dairy Specialist

■ Miscellaneous

Guide to Life

Don't name a pig you plan to eat.

Country fences need to be horse high, pig tight, and bull strong.

Life is not about how fast you run, or how high you climb, but how well you bounce.

Keep skunks and bankers at a distance.

Life is simpler when you plow around the stump.

A bumblebee is faster than a John Deere tractor.

Words that soak into your ears are whispered, not yelled.

Meanness doesn't happen overnight.

To know how country folks are doing, look at their barns, not houses.

Forgive your enemies. It messes with their heads.

Don't sell your mule to buy a plow.

Don't corner something meaner than you.

It doesn't take a very big person to carry a grudge.

You can't unsay a cruel thing.

When you wallow with pigs, expect to get dirty.

From e-mail, author unknown

■ Reproduction

Benchmark reproductive performance with pregnancy rate

Reproductive performance is a function of certain management policies and how well these policies are implemented in the day-to-day management of the herd. It has long been known that there is an important economic advantage to be gained by efficient reproduction in dairy herds. Throughout her herd life, a cow should calve without difficulty, experience little or no postpartum reproductive disease, breed back within an optimal time period, carry each fetus to term and have a live birth. The ability to use records effectively is one of the cornerstones of reproductive management. Complete and accurate herd records should provide the tools necessary to define past herd performance, assist in establishing goals for the benchmarks being evaluated and allow monitoring to determine the impact of the plan developed to reach an established goal. The first step in record analysis is to identify key benchmarks that reflect components of reproductive performance that affect the desired outcome or goal. In fact, on many farms data overload is the problem where too much information is available and decisions must be made on what parameters are really important and useful.

- There are many ways to measure performance — comparison against standards proposed by an expert, comparison against past performance or comparison against others.
- Pregnancy rate can be defined as the percentage of cows eligible to become pregnant, in a given time frame that actually do become pregnant. Usually the time frame used to calculate pregnancy rate is 21 days.
- Pregnancy rate is the reproductive performance benchmark that incorporates service rate and conception rate in a timely fashion and should be the cornerstone of performance evaluation.
- The average pregnancy rate for DHI herds is 14 percent. Herds in the top 10 percent average 20 percent and the best herds average 24 percent.
- Pregnancy rate calculates how “fast” cows get pregnant past the voluntary waiting period. Efficient reproductive performance is critical for maintenance of a fresh herd and higher daily milk yield. Pregnancy rate is now being reported on the DHI-202 Herd Summary Sheet and should be used as the benchmark to evaluate reproductive performance.

Source: R.L. Nebel, Extension Dairy Scientist, Virginia Polytechnic Institute & State University

■ Health

Avoiding “three manure meals”

Dr. Sheila McGuirk reported at the Midwest Herd Health Conference that 40 percent of dairy farms cannot supply an adequate number of replacements from their own herd. The main reason cited in a USDA 2002 study showed preweaned heifer calf mortality at 8.5 percent and another 2 percent by calving.

Dr. McGuirk believes the key to preventing early calf health problems is immediate removal of calves from their mothers. The longer the calf stays with her mother, the greater chance she has to receive the three manure meals before adequate colostrums is ingested with life-protective antibodies.

The risk of manure meals comes:

- 1) when the calf is born
- 2) when the calf seeks to suckle
- 3) during the suckling process

Calves try to stand immediately after birth. As they attempt to stand, they often fall nose first in the maternity bedding. Dr. McGuirk says it only takes a pea-sized amount of manure for the calf to contract Johnes. Other harmful pathogens include E-coli, salmonella and cryptosporidium.

Within 90 minutes of birth, the calf will begin to seek a teat to suckle. The calf often starts to seek a teat on the underside of the mother’s belly and/or on the side of the rear legs. In many cases, these areas are contaminated with manure. Finally, the calf reaches a teat and gets its third potential manure meal before adequate colostrum is consumed for protection.

Another reason to remove the calf from the mother is inadequate high quality colostrum consumption within 24 hours of birth. In the USDA study, 43.9 percent of the calves were not separated from their mothers, of which 23.1 percent received all their colostrum by nursing. It was further reported that 61.8 percent of the calves received less than the four quarts required for passive immunity. Often the suckling calf does not consume four quarts within the desired four hours after birth.

The best colostrum for passive immunity is right after birth. If colostrum is harvested six hours or longer after birth, it becomes more diluted as the mother starts to secrete normal milk.

The most important aspect of feeding colostrum is VOLUME! A minimum of three quarts are recommended for Jerseys, Guernseys and Ayrshires, while four quarts are recommended for Holsteins and Brown Swiss.

To determine adequate colostrums or antibody passive transfer, it is recommended to periodically blood test 12 calves. The serum protein concentration test from blood samples can be conducted as soon as six hours after feeding colostrums, but no later than one week of age. Typically two of the 12 calves will fall below the required 5.5 gm/dl if serum protein concentration. That’s normal. However, if three out of 12 (25 percent) or more fall below the cut point 5.5 gm/dl, then you have a problem.

In summary, dairy producers need to move calves from their mothers immediately after calving. Now, how do we get calves moved? It’s going to be different on every dairy farm, depending on size and number of people working in the calving area. The most important thing is to make it a top priority.

Source: ISU Extension View

■ Management

Questions about mandatory animal identification

What is driving the requirement for individual animal identification?

Recognition that naturally occurring or introduced disease threats could have catastrophic impact on animal production and all of agriculture, the food system, and the U.S. economy. Industry groups have cooperated with the National Animal Industry Association (NAIA) to develop a working plan to implement a standardized system for assignment of unique, individual identification numbers to all cattle used in food production. A national database will be developed for use in tracking animal movement through the food chain and as a traceback system in the event of a disease incident with potential for catastrophic impact.

Who is responsible for implementation?

A working plan was developed from deliberations of the National Animal ID Task Force convened by the NAIA. The plan was approved in October 2002 by the U.S. Animal Health Association. Implementation and subsequent development of the plan is being coordinated by the Animal and Plant Health Inspection Service (APHIS) of USDA.

When will it be required?

There are two phases to be implemented. In the first phase, APHIS will require all animal production and processing sites to have unique "premise" identification by July 2004. This includes farms, slaughter plants, feedlots, sale barns and exhibition facilities. The second phase will require that each cow have a unique, 12-digit identification number assigned to it, preferably at birth, before the animal can move in commerce. That means that cows will have to be identified before they leave the farm for any purpose. Phase two is expected to be implemented in 2006.

What will be required for premise ID?

Though the plans are not fully developed, this will likely involve geographic location recorded with the types of animals housed there. Each site will be linked in a national database with contact information for the owner and manager of the animal production at that site. Recording of premise ID will be coordinated through local USDA offices.

What will be required for animal ID?

Initially cattle will be required to have duplicate physical tags that include the unique number that they have been assigned. The tags will likely be similar to those eartags used already for management purposes. The second tag can also be an electronic radio frequency ID that has the unique number embedded in it. Future developments in the technology may include intraruminal or subcutaneous implants that would last the life of the animal.

Where will I get the tags?

The working plan anticipates the need for a number of private industry suppliers of tags. The tags will be manufactured in accordance and with oversight by APHIS, but there will be competitors in the market.

Will the system integrate with breed registrations?

Possibly. Many breed organizations are using a modification of the plan for identification of cattle already. However, those systems use a 10-digit identifier rather than the 12-digit number proposed in the national plan. There will therefore need to be coordination among registries and the ID registry to integrate the two systems.

Where can I get more information?

As information becomes available it is posted at the NAIA website www.animalagriculture.org the APHIS Web site www.aphis.usda.org, and the University of Illinois Food Security Initiative Web site <http://foodsecurity.uiuc.edu>.

Source: G.E. Dahl, 2004 Illinois Dairy Report

■ Labor

Reasons for conflict

It is a fact of life that there will be conflict in your decision-making role as herdsman, general manager and owner. Part of the key to effective relations is maintaining respect and conducting yourself in such a manner. According to *CORD, Community Organizing: An Experience for Building Healthier Communities*, most often the reasons are as follows.

Limited resources

Conflict often results when a number of groups are competing for limited resources.

Communication problems

As groups evolve, they tend to become concerned only with their own issues and also to develop their own vocabulary around those issues. Communication problems may develop when the receiver of information does not understand the particular vocabulary or communication style of a group.

Different interests and goals

One individual or group feels its issues are ignored or are more important than another individual or group's issues, and there is a lack of agreement concerning the direction of group activity.

Different perceptions and attitudes

Just as individuals perceive things differently, the groups to which they belong also have different perceptions. Groups, as well as individuals, tend to evaluate issues according to their backgrounds, norms, and experiences. This may be a problem, for instance, when there is a difference in performance expectations of members of the group or between groups.

Lack of clarity

Lack of clarity about the task to be accomplished and who is responsible for specific tasks is a frequent cause of conflict.