



NDSU EXTENSION SERVICE

# DAIRY CONNECTION

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## EDITORIAL

This quarterly edition of Dairy Connections will provide you with up-to-date information and the latest on trends in dairy production and systems for North Dakota. I have included excerpts from experts around the country who provide leadership in research on topics from management to nutrition.

Looking at the calendar, spring should be on its way. At this writing we're all anticipating what world politics

hold for us. My best wishes to all of you who have family in the military and the reserve, as do I.

Lastly, be watching for more efforts from the North Dakota Dairy Task Force. Although the recent funding request was not successful, members are not deterred. Help guide their efforts with constructive input and a willingness to get involved.

Until next issue, all the best.

Sincerely,

J.W. Schroeder  
Extension Specialist-Dairy

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## NUTRITION

### A simple look at the complex issue of calf nutrition during early lactation

It used to be so simple to feed the young dairy calf. A calf feeder would put a cup of milk replacer into two quarts of warm water, give it a quick stir to mix into solution and then feed it to a hungry calf.

During the past two years, calf nutrition research has taken a look at the level of nutrition the dairy industry traditionally provides to a calf. This research has led to the introduction of a new method of feeding milk replacer to calves. This new method has been referred to as biological growth, intensive feeding, accelerated growth or rapid growth feeding of calves. This article will refer to the term rapid growth when describing this new method of feeding calves.

## Traditional feeding of calves

We need to fully understand what is meant by the traditional method of feeding dairy calves. Milk replacers were first developed more than 40 years ago in response to the dairyman's need to have an economical alternative to feeding saleable milk. The desire was to allow dairy producers to sell their milk at market prices and then purchase a replacer that was more economical but would still grow calves at an acceptable rate.

The traditional feeding system mixes one pound of powder in a gallon of warm water. The calf is then fed two quarts of milk replacer solution twice a day. This method of feeding is designed to encourage dry feed intake. It is this emphasis on calf starter intake that will stimulate early development of the rumen which is necessary for a successful weaning and transition program to work.

To fully understand the issue of starter intake, we need to look at starter intake and energy. A 99-pound calf requires 1.81 Mcal of Metabolizable Energy (ME) to maintain its body weight in a good environment. One pound of a typical 20-20 calf milk replacer provides about 2.15 Mcal of ME. The milk replacer provides enough energy to maintain the calf but the calf will need to eat dry feed to grow. Traditionally fed calves' need for energy drives them to eat their starter feed.

There are many positives to a traditionally fed calf program. It is easy to manage, minimizes expense and producers are comfortable with the system because they have done it for many years. In spite of these positives, we do know that we can grow calves on milk at a faster rate when we use higher protein levels and greater powder intakes.

## Rapid growth feeding of calves

Rapid growth feeding programs tend to have two common features. The milk replacer is higher in protein (24-30 percent) and you feed more than the typical one pound of powder per head per day. The higher protein content has been shown to grow lean tissue in the calf. Producers that try feeding more of a typical 20-20 milk replacer or whole milk will find that calves may initially grow more but the tissue is not muscle or skeletal growth. These calves will quickly lose this body weight gain later in life.

The more intense rapid growth feeding programs on the market have feeding rates that can go as high as 2.5 to three pounds of powder per calf per day.

Problems to be aware of with these intense rapid growth feeding programs are:

- Higher milk feeding rates will increase daily gain but reduce starter intake.
- Reduced starter intake can delay weaning age.
- Poor starter intake at weaning can cause calves to stall and lose their extra weight gain in the transition pen.
- Out-of-pocket expense is much greater with these programs.

A more moderate approach to increasing daily gains in calves has recently emerged to address some of the concerns noted. Accelerated Genetics has developed a feeding program using their Calf Accelerator Milk Replacer (26 percent protein; 15 percent fat). This milk replacer utilizes the concepts of rapid growth feeding with higher protein and greater feeding rates (1.5 pound per calf per day) but minimizes the concerns discussed above. The slightly lower feeding rate of Calf Accelerator should not reduce starter intake as much as with the intense programs. Getting the calf to eat starter feed earlier can help to reduce costs and also help to increase success at weaning and in the transition pen.

## Key issues that many producers are discovering with rapid growth programs:

- Calf stools will be looser on these programs. This does not mean they are scouring or sick, there is just more fluid being fed and the manure is not as firm. There will be a need for extra bedding with these calves.
- Free choice water is very important. Water will help stimulate starter intake and dilute solids in the milk solution if it is more concentrated than normal.
- Transition pen management. Calves on these programs develop their rumens later in life than on traditional programs. Because of this, calves can go backwards after weaning if starter consumption is not adequate. Hay may not be introduced until 12 weeks of age to further help with rumen development.
- Expenses. Make sure these programs are producing positive results as much as three or four months post-weaning. Focus on return on investment.
- Disease. These programs do not cause greater disease in calves but if there are subclinical or clinical issues present on the farm, they may become more obvious if they are not controlled before going on a rapid growth program. Management issues such as biosecurity, maternity pen and colostrum are very important.
- Overall system management. Rapid growth fed calves are usually fed in phases. This means that calves in week one or week seven are fed differently than the other calves. Management must have systems in place to make sure these feeding changes are consistently done.
- Overall considerations on calf growth. The decision on milk replacers for many years has been based on mixing, smell, service and price. These continue to be important but now calf nutrition can play a big decision on what product to purchase and even what feeding program to use. Consult with a knowledgeable service person to decide if a traditional program or a rapid growth program is best for your operation.

*Source: Gabriella A. Varga, Dairy and Animal Science Extension, Pennsylvania State University*

*Reprint Permission, Progressive Dairy News, A.C. Leavitt.*

## ■ MILK QUALITY

### Tail docking, cow cleanliness and mastitis

The Pasteurized Milk Ordinance (PMO) requires that the udder and teats be cleaned before the milking machine is attached. Obviously, the cleaner the cows are when they enter the milking area, the easier it is to accomplish this task. Clean cows also make the job of milking more enjoyable.

Many producers have begun docking the tails on their cows to assist in keeping cows clean. Some producers report that the cows are much cleaner when the tails are docked while others find little difference.

Researchers at the University of Wisconsin recently examined the effect of tail docking on milk quality and cow cleanliness. They studied the cows on eight Wisconsin farms. The herds were followed for eight to nine months. All herds were housed in free stall barns. Half the cows on each farm were docked while the other half were left intact.

Milk samples were collected five times during the trial for determination of intramammary infection (IMI). They also scored cleanliness of the udder and legs simultaneously. Somatic cell count data were obtained from DHIA monthly.

The researchers found no significant difference in the cleanliness of the legs and udders between the docked and undocked cows. There was a significant interaction between the docked and undocked cows. This indicates that tail docking did not affect the incidence of mastitis in these herds.

This study agrees with a few previous studies which have not been able to demonstrate a significant beneficial effect of tail-docking. In addition to the general lack of scientific evidence supporting the practice, there are other factors that may impact a producer's decision about whether or not to dock tails. A report has recently been released by the Food Marketing Institute and the National Council of Chain Restaurants, who have established a scientific advisory panel to help them "improve the care and handling of animals used for food" (June 2002 report - FMI-NCCR Animal Welfare Program, which can be found at <http://www.fmi.org/>). Under the guidelines for dairy cattle, the report "recommend(s) that switch trimming be used rather than taildocking." While this is only a suggested guideline at this time, it seems likely that this could be one of the standards that the retail community (and public) will require producers to meet in the future. If you are currently docking the tails of your cattle, or considering this practice, it may be beneficial to discuss with your staff, your veterinarian and other advisors the benefits and costs associated with this practice. For some producers, the real (and perceived) benefits may continue to outweigh the costs. However, it is also possible that you will decide, in the light of the above evidence, that this practice is not beneficial enough to warrant continuing.

*Source: Journal of Dairy Science (October 2002); Georgia DairyFax. W.D. Gibson, Extension Dairy Specialist, and E. Hovingsh, Ext. Veterinarian, Virginia Tech*

## ■ MANAGEMENT

### Silo management during feed out

Many forage crops are chopped and allowed to ferment as a means of preserving nutrients. This allows large quantities of feed to be harvested rapidly, reducing the chance of loss due to rain or poor drying conditions compared with making hay. One of the challenges in making good silage is to minimize nutrient losses after harvesting. Losses are affected by the type of crop ensiled, dry matter content of material ensiled, packing density, fermentation rates, sealing air out of silage, and minimizing exposure to air during feedout.

Many producers have built bunker or trench silos to store silage. Compared to upright silos, construction costs are lower and silage can be packed into and removed from these structures much faster. However, average dry matter losses during feedout in bunkers and trenches can be much high than other storage systems. Most bunker and trench silos are built too wide and silage packed too high to allow the removal of at least six inches of silage from the entire face each day. Because less silage is removed, dry matter losses increase because of secondary fermentation.

Secondary fermentation occurs when aerobic bacteria in the silage are exposed to air. This type of fermentation degrades soluble carbohydrates and generates heat in the process. Because the more soluble nutrients are used up, the remaining silage is less digestible and provides less energy. Kansas State University researchers reported decreased dry matter intake and nutrient digestibility when as little as 5 percent spoiled silage was fed to steers. The impact on milk production of dairy cows has not been measured directly but was estimated to be at least 4 pounds per cow per day. The decrease in milk yield would be higher in the summer. The amount of secondary fermentation that occurs is influenced by the density of the silage and the amount of air introduced into the silage.

The density of silage measured in bunker silos by Wisconsin researchers is outlined in Table 1 and normal dry matter losses at selected densities are outlined in Table 2. **(Tables appear on following page.)** The density of the silage is affected by the dry matter content of silage, weight of the tractor used for packing, the time it took to pack and the thickness of the layer packed. At lower densities, more air can penetrate the silage increasing secondary fermentation. The firmness of the silo face is another factor influencing the face of the silo firm. However, many feeders use a loader bucket to loosen the silo giving the false impression that no spoilage has occurred.

If at least 6 inches of silage cannot be removed from the entire face of the silo each day and the silo face is not smooth and firm, steps should be taken to reduce nutrient losses to secondary fermentation. The first step is to work with the feeder to develop better methods of removing silage to maintain a smooth, firm silo face to prevent the introduction of air into the silage. Some feeders do an

**Table 1. Average density of silage stored in bunker silos.**

Characteristic	Haycrop Silage			Corn Silage		
	Average	Range	SD*	Average	Range	SD*
Dry matter, %	42	24-67	9.50	34	25-46	4.80
Wet density, lbs/ft <sup>3</sup>	37	13-61	10.90	43	23-60	8.30
Dry density, lbs/ft <sup>3</sup>	14.8	6.6-27.1	3.80	14.5	7.8-23.6	2.90

\* SD – standard deviation

extremely good job of removing silage without disturbing the remaining material with a loader whereas other may need more training or specialized equipment. The second step involves dividing a silo that is too wide into two halves and feed only from one half. This will allow more silage to be removed from the silo face each day and provide fresher silage to the cows which will maintain higher levels of milk production. This approach results in more visible spoilage on the side walls, but keeps the silage fresher which should support higher dry matter intake and milk yield.

Now is a good time to evaluate your silage feedout management before summer heat stress. Improvement in feedout management will not only reduce secondary fermentation but also improve silage quality, which could improve milk yield.

**Table 2. Dry matter losses as influenced by silage density.**

Density	DM Loss at 180 Days
(lbs. DM.ft <sup>3</sup> )	(% of DM ensiled)
10	20.2
14	16.8
16	15.1
18	13.4
22	10.0

Ruppel, 1992

## ■ LABOR

### **If I've told you once . . . standard operating procedures ensure milking is done right every time.**

"How many times have I told you? Do it this way!" If you haven't said this to a milker, you've probably heard someone else say it. Or maybe your regular employees perform each step of the milking process the "right" way to produce a quality product. But when a relief milker comes in, do you shake your head in disbelief at the person's performance?

More than once, you may have said: "When Jim does relief milking, something always happens. The cows get mixed up, production drops or equipment breaks. Or we have several days of high somatic cell counts. He's been trained. So what's happening?"

Blame for faulty milk harvest may not lie with someone like Jim or a regular employee. The finger of blame could just as well be pointed at management. Have you developed standard operating procedures (SOPs) with input from employees? Have SOPs been used for milker training and evaluation? Are they readily available so employees can easily see a list of steps? Are more detailed instructions available if needed? If you answer no, you could be sacrificing milk quality and jeopardizing herd health.

Cows crave consistency. Harvesting a marketable crop is one of the most important jobs on a farm. For a dairy, that crop is milk. Dairy cows are more sensitive to harvest practices than, say, corn or hay. As creatures of habit, cows want things done the same way every time. As biological organisms, they're prone to disease problems that can impact milk quality. SOPs give cows what they need and want. They give producers a tool to help assure milk harvest is done correctly and consistently every time. And milk harvest SOPs promote a high quality crop. Think about the number of steps involved in getting milk from a cow, and you realize that writing SOPs for milking and udder health is a huge task. Don't attempt to write them alone. Everyone involved in milking and herd health should be part of the effort. It will make your job easier and improve employee acceptance of SOPs.

To get input, post on a bulletin board the tasks, such as milking or moving cows. Begin a list of the detailed steps for performing each task such as the steps for udder preparation. Leave extra space for employees to make additions and suggestions to the lists and steps. Use their suggestions to develop or review your SOPs.

### **An SOP for parlor setup**

No two standard operating procedures are alike. What works with one farm's milking equipment and parlor, for example, won't work for another. This parlor setup SOP gives an idea of one dairy's approach. To setup the milking parlor:

1. Extend the index rails on each side of the parlor to the narrow position with the toggle switches located by

the sixth milker on each side. At the completion of Group 2, the index rails must be retracted into the wide position to allow more room for the bigger, older animals in Group 3.

2. Close the two front gates and open the two rear gates.
3. Close the cut gate that diverts animals to the hospital pen.
4. Remove the jetter cups from the first unit.
5. Untwist the milk hose so there are no kinks and so the small, double pulsator hose is on the top.
6. Clamp the automatic take-off (ATO) arm to the claw using the thumbscrew on the clamp.
7. Insert the milk hose into the hook on the ATO arm.
8. Please the wash hose out of the way, behind the ATO box, and insert the jetter cups into the jetter cup holders.
9. Turn the manual/automatic switch to automatic and pull out the red start knob.
10. Repeat for all 20 units.

*Source: Dairy Business Communications*

## ■ HERD HEALTH

### **How do you know the claims for a product are true? OR Separating the truth from the voo-doo!**

As a dairy farmer, how many times a year do you deal with a company representative or receive advertisements from a company that has a product that will solve a multitude of problems or ills for your cows? How many times have you brushed the representative off, not knowing if he/she could help or not? How many times have you purchased an additive or similar product, not knowing if it would even pay for itself, much less make money? How can you guarantee that every choice you make will be profitable? Unfortunately there are no guarantees, but you can increase the odds of success by asking the right questions. Try these questions out on the next representative that comes to visit. At the end of the session you will be better informed and may purchase a product that will make a profit. Or you may make a decision that will save a lot of money.

### **What does your product do?**

Any representative should be able to tell you exactly what his product is supposed to do. If he can't, or speaks in general, flowery terms ('...an all natural product that makes cows healthier, look better, lowers somatic cell count, increases pregnancy rate, increases milk production, reduces environmental pollution, and stops global warming'), watch out.

### **How does the product work?**

Any representative should be able to explain the mechanism that the product works by, and there should be a definite mechanism. If he can't explain the mode of action, or get a technical service representative to explain it for you, watch out.

### What effect does the product have on the cow?

Claims of improved milk yield, reproduction or health are the result of some direct effect on the cow. Let them explain how the product impacts the cow.

### What is the response, and how long will it take?

Should the cow exhibit an immediate response in milk yield, should reproductive performance improve with the next 90 days, or will incidence of mastitis or lower somatic cell count be measurable different in the next couple of months? How large should the response be? The representative should be able to predict the response based on previous research with the product.

### Is there research to support claims for the product? Is the research from an independent entity, such as a university?

Ask to see the research results, and ask who did the work. If the company has spent money to fund research, they will be proud to show you the results! Research should be conducted with adequate cow numbers with a control group, and by qualified individuals.

### If the research was conducted on-farm, ask if there was a control treatment.

Good comparative research should have an identifiable control group (not receiving the treatment or product) that is similar to the treated group of cows to measure response to treatment.

*Source: Georgia DairyFax, W. West and K. Bernard, Extension dairy Scientists*

### Johne's genetic code is mapped

Researchers at the University of Minnesota in November announced they had "mapped" the genome or genetic code for Johne's disease, a breakthrough that is expected to lead to better and faster diagnostic tests initially and perhaps eventually to a vaccine that would eradicate the disease.

Clinical and subclinical cases of Johne's, a bacterial infection, are estimated to cost the U.S. dairy industry \$250 million per year due to decreased milk production, increased calving interval, premature culling, and animal deaths. In addition, much scientific uncertainty exists as to whether there is also a link between cattle Johne's and its fatal human counterpart, Crohn's disease.

If you haven't done it already, contact the North Dakota Department of Agriculture about the volunteer Johne's program.

### Biosecurity Quiz: How well are you protecting your herd against disease?

As the industry becomes more diversified and the threat of foreign animal disease increases, biosecurity is a growing concern. Although biosecurity is an easy concept to understand, it is often very difficult to put into practice. Many activities that we have done for years without thinking about it now are known biosecurity risks and may be having long term impacts on our herds' health and production.

For example, introducing a heifer that is infected with Bovine Viral Diarrhea (BVDV) can result in significant losses due to disease and calf losses. In addition, calves born to dams that were exposed to the virus during early pregnancy can be persistently infected with the virus and, undetected, may be a source of disease to others in the herd. This is only one example of how something so common — adding a new heifer to the herd — can result in long term problems. Imagine if this heifer had a foreign disease such as Foot and Mouth!

Here is a short biosecurity quiz to see how vulnerable you may be to the introduction of new diseases in your herd:

Question	Answer (Points)
1. Do you purchase animals every year?	Yes (2 pts) No (0 pts)
2. If you purchase animals, how long do you keep them separated (quarantined) from the rest of the animals in your herd?	Less than 2 weeks (4 pts) 2-3 weeks (3 pts) 30 days (2 pts) 60 days (1 pt)
3. Do you have animals leave the farm and return?	Yes (2 pts) No (0 pts)
4. If you do have animals leave and return, do you quarantine them when they return?	No (4 pts) Yes (1 pt)
5. Do cattle in the quarantine pen have contact (i.e. shared waterer, feed bunk, fenceline, handling facility) with other cattle in your herd?	Don't have quarantine pen for new animals (3 pts) Yes (2 pts) No (0 pts) Have closed herd, and no animals that leave ever return (0 pts)
6. Can manure run off from your quarantine pen into your calving pen or calf hutch area?	Yes, most days (4 pts) Yes, when it rains hard (2 pts) Never (0 pts)
7. Do you loan or borrow equipment (i.e. manure spreader, trailers, scrapers) from other farms?	Yes (2 pts) No (0 pts)
8. Are visitors (and personnel) with outside employment in agriculture required to disinfect their boots before entering livestock areas?	No (2 pts) Yes (0 pts)
9. Do your hoof trimmers sanitize their equipment before coming onto your farm?	No (2 pts) Yes (0 pts)
10. When you ship cattle, does the truck stop at more than one farm during a trip?	Yes (2 pts) No (0 pts)
11. Do other species (i.e. dogs, cats, deer, horses) have contact with your cattle or cattle feed?	Yes (3 pts) No (0 pts)
12. Do your cattle have fenceline contact with neighboring cattle?	Yes (3 pts) No (0 pts)
<b>Scores:</b>	
<b>0-6 pts:</b>	WOW! You are probably doing a good job of keeping disease out, now you can focus on managing disease and production within your herd.
<b>7-11 pts:</b>	You are aware of the importance of biosecurity, but can still take a few steps to tighten up your protocols.
<b>12-16 pts:</b>	With a bit more vigilance, you can significantly lower the probability of disease entering your herd.
<b>17+ pts:</b>	It might be a good time to talk with your veterinarian about how you can improve your facility's biosecurity.
<i>Source: Food animal Health &amp; Management Program, Univ. of Georgia. D. Cole, Veterinarian</i>	