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UNIVERSITY OF KENTUCKY College of Agriculture

Kentucky Dairy Notes

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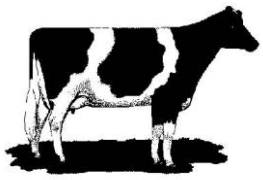

Managing Your Dairy Cows Feed Intake Is Under Your Control

Donna M. Amaral-Phillips

I have often made the statement, "the more feed an early lactation cow eats, the more milk she can produce, and the more profit she can potentially make for her owner". This statement emphasizes the importance of managing dairy cows to optimize feed intake, especially in early lactation and during the pre-fresh period. Why is this? After meeting the needs for maintenance, every extra pound of dry matter (feed with the water removed) that an early lactation cow eats provides enough energy to support 2 pounds of milk. In addition, cows which peak higher in early lactation produce more milk over the entire lactation. Thus, it behooves all dairy farmers to manage dairy cows so that feed intake is not compromised. Keeping a consistent source of feed composed of high quality forages in front of your dairy cows 22 hours a day (an additional 2-3 hours spent daily in the holding pen) is a high priority. Getting this feed into your cows is under your control and often times separates those herds that can get cows to milk well, stay healthy, and rebreed from herds which are lower producing and performing.

Feed intake determines nutrient concentration in diets

Dairy cows require a certain amount of each nutrient. The concentration of each nutrient is thus determined by feed intake on a dry matter basis. As shown in Table 1, when feed intake increases from 45 lbs of dry matter to 50 lbs of dry matter, the energy density or concentration of energy in the diet can be decreased dramatically and still provide the same amount of energy to the lactating dairy cow assuming constant amount of milk production. When nutritionists balance rations, feed intake for a group of cows is estimated based on body weight and expected milk production. The nutrient density of the diet then is set based on this expected intake and performance of the cows fed this diet.

Table 1. Energy density needed at two different amounts of feed intake to support the same amount of milk production.

	Need 35 Mcal Energy (NEL)
45 lbs dry matter	0.77 Mcal/lb DM
50 lbs dry matter	0.69 Mcal/lb DM

What happens when feed intake is not as expected? The short answer is....Cows do not get the nutrients needed and production can suffer, cows withdraw body stores or reserves and get too thin, or a combination of these two effects. Bottom line---cows do not milk as well as expected. These decreases might not be seen this lactation but are seen the next lactation when cows lack the body stores to support higher production in early lactation.

This concept is illustrated in Table 2. If dry matter intake drops 5 lbs, the amount of energy consumed from a TMR drops by 4 Mcal NEL which is equal to the amount of energy needed to produce 12 lbs of milk. Fresh cows and timid first-calf heifers are often the most affected by limited feed intake. These cows often represent the future/current profit.

Table 2. Effect of decreased feed intake on energy intake.	
	Energy density of the total diet— 0.74 Mcal/lb DM
45 lbs dry matter	33 Mcal NEL
50 lbs dry matter	37 Mcal NEL
Difference- 4 Mcal NEl = 12 lbs of milk	

Management influences feed intake

Several factors influences feed intake. Many of these factors can be manipulated by management of the cows, her environment and her diet. Others we may have little control over in the short run as they relate to the cow's current milk production. By understanding how each of these factors control feed intake, dairy farmers and their consultants can understand how and when to modify existing management protocols to optimize feed intake.

Environmental Factors which affect feed intake

1. Temperature and humidity (Temperature humidity index): Cows eat less when undergoing heat stress which generally starts around 70°F depending on the humidity. These effects can be reduced through use of fans over feedbunks, freestalls and in holding pens. In addition, intermittent sprinklers (on 2-3 minutes -- off 12 minutes with fans running continuously) which wet the cow's coat can be used at the feedbunks and in the holding pens. Barns should be opened up to allow air movement. Don't forget the dry cows. Reducing heat stress, especially in pre-fresh cows, can improve feed intake before calving and help prevent problems at or after calving. Remember that cows- dry and milking—on pasture need shade also.
2. Provide adequate bunk space per cow: The general herd recommendation is 24-30 inches per cow. In fresh pens and pre-fresh groups, the recommendation is 36 inches per cow so that bunk space is not limited and more timid cows and heifers have access to feed. We never want to limit bunk space and thus limit intake. This becomes more of a challenge in 6 row barns, some compost bedded pack barns, or when overcrowding of a barn or group occurs.
3. Bottom surface of feedbunks: Ideally, the bottom surface of fenceline feeders should be smooth to encourage intake.
4. Maintain freestalls for cow comfort: Dairy cows prioritize lying time over feeding time, so restrictions on lying time ultimately negatively impact feed intake. Adequate amounts of bedding in freestalls should be maintained for excellent cow comfort. Mattresses should have 1 inch of bedding to prevent hock lesions and sand bedded stalls need to be leveled to encourage usage.

Diet fed affects feed intake

1. Consistency of ration ingredients and feeding times: Dairy cows are creatures of habit and do best with a consistent schedule and composition of the diet. When feeding dairy cows, we first feed the rumen bacteria which in turn feed the cow. Thus, consistency is important for both the rumen bacteria to do their job of digesting feed and the cow herself. Bottom line: (1) minimize changes in feedstuffs, (2) when changes are necessary, make changes slowly, and (3) keep the composition of the TMR mix consistent from batch to batch (measure dry matter of wet feeds and adjust accordingly).
2. Forage quality: Intake is higher with high quality forages. Lower quality forages do not pass out of the rumen as quickly thus limiting intake.
3. Prevent heating of feeds in the feedbunk: Especially during the summer months, feed should be mixed at least twice daily and fed immediately.
4. Prevent heating of stored feeds: Silo faces (bags and bunkers) need to be maintained so that limited excess silage removed from the packed face is left (and not fed) to prevent heating of silages before feeding. The face of silo bags should be recovered after feeding during the hotter months to divert the sun from the face of the exposed silage.

Figure1: Does this fresh cow have access to plenty of feed considering cows will be fed again in 6 hours?

5. Access to feed: Cows should have access to feed 22 hours daily (with an additional 2-3 hrs daily spent in the holding pen) with feed pushed up numerous times daily so cows have easy access to feed. Dairy cows eat 9 to 14 meals daily with larger meals upon return from the parlor and/or when fresh feed is provided. Thus, timing of fresh feed is important.
6. Quality feed left at next feeding: Feed, not just corn cobs, should be left at the next feeding. Generally, we recommend that 3-5% feed be left at the next feeding and that feedbunks are cleaned out daily. Excess feed can be fed to steers or older heifers.
7. Palatability of feed ingredients: Some ingredients may limit consumption of grain mixes especially when fed separately from forages, but this usually is not a problem with TMR's.
8. TMR too wet: The moisture content of a TMR should be between 48 and 52%.
9. Particle size of TMR's: Overmixing of the TMR or sorting by cows can result in acidosis resulting in decreased feed intake and laminitis (feet problems).

Cow factors which influence feed intake

1. Milk production: One of the largest influences on feed intake is milk production. As milk production increases, the cow needs more nutrients to support this increase in production. Thus, the cow increases her feed intake to account for this increased need for nutrients.
2. Stage of lactation: After freshening, feed intake increases quite rapidly. A review of 7 Western Canadian herds (14,000 records) illustrated that mature cows peaked in intake about 8 weeks into lactation and first calf heifers did not peak until 14 weeks after freshening. Feed intake slowly declines as milk production decreases in later lactation.
3. Lactation number: First-calf heifers eat less than mature cows. Also, they may be more timid and have a harder time competing with mature cows for bunk space. Thus, the recommendation is to house and feed first-calf heifers separately from the mature cows, when feasible.
4. Body condition at calving: Cows which are over conditioned at calving may eat less after calving which sets the stages for other metabolic disorders which further decrease feed intake. Bottom line—cows should go dry in proper body condition (body condition score of 3.25-3.5) and maintain this condition in the dry lot. Do not over or underfeed energy to dry cows, consequently, rations must be balanced for these cows.
5. Social structure within the group: Timid cows are the last to eat and without quality feed available at all times and adequate bunk space, they are the ones where feed intake can be compromised. These cows are generally the fresh cows, especially those with subclinical or clinical disease problems, and first-calf heifers. Remember these cows are generally the money makers.
6. Body weight: Larger cows eat more than smaller cows. For example, we would expect higher dry matter intakes from a Holstein herd averaging 1500 lbs body weight versus 1200 lbs if they are producing the same amount of milk.

Strategies for Dealing with New Somatic Cell Count (SCC) Requirements
Jeffrey Bewley

By now, in one form or another, you have likely heard about upcoming changes to somatic cell count limits for the dairy industry. Although there is some uncertainty about what the final requirements will be, it is clear that changes are occurring and most everyone will be affected. At this stage, the official regulatory SCC limit remains at 750,000 cells/mL. This limit has been in effect since 1993.

EU Changes. Interestingly, the market has driven the current demand for lower SCC milk. Much of the rest of the world has had a lower SCC limit for many years. As we move toward a more global dairy market, what we do in the United States is increasingly affected by forces outside of our borders. The European Union (EU) has indicated that, beginning October 1, 2010, any processor who ships milk products to the EU must ensure that the milk is obtained from farms with SCC less than 400,000. Actually, this regulation has been in place for a while, but the 400,000 limit could be achieved by mixing milk from multiple farms. Now, the EU has indicated that each farm must meet this requirement. Although a large percentage of the milk in the Southeast is used for domestic fluid consumption, the rest of the product is used for manufactured products or milk by-products. This is where processors may export some product to the EU at times. Because of the changes in milk utilization, some processors may find it necessary to require all of their milk meets this requirement. Across the country, some processors and cooperatives have already made decisions about how they will handle this situation and have distributed letters to producers. Other processors are still deciding how they will handle the new limits. Exactly how this limit will be calculated remains to be seen also. The EU standard states that the 3-month rolling “geometric” average cannot exceed 400,000. Essentially, this means that a few tanks over 400,000 would not be a problem as long as they were balanced out with more tanks less than 400,000. Regardless of this new development, all milk processors would like to acquire milk with lower SCC. Milk with a lower SCC results in higher cheese yields and longer fluid milk shelf life. An important distinction to make is that milk with a higher SCC does not represent any risks or threats to human health.

Opportunity. Over the next few months, we will learn more about how this limit will be enforced. For some producers, these changes may lead to some painful decisions and challenging hurdles to reduce bulk tank SCC. However, looking at the glass half-full, we should view this as an opportunity. Maybe we can use this opportunity to produce a higher quality product for dairy product consumers. Maybe this will have a positive effect on consumer demand. At minimum, it can have a positive effect on consumer perception of production of a safe, wholesome product. Perhaps, most importantly, reducing somatic cell counts at the farm level will help improve production and profitability. With a bulk tank SCC of 500,000, it is estimated that 16% of the quarters in the herd are infected and milk production is 6% less than it would be if the bulk tank SCC were 200,000.

Back to the Basics. In dealing with somatic cell count problems and maintaining a low somatic cell count, it is important to remember that there is ***no single*** most important component. When we ask dairy producers who maintain a low SCC how they do it, they tend to answer "attention to detail." Don't try to make the milking process more complicated than it is. Resist the temptation to find magic bullets to fix underlying management problems. There are numerous products designed to help keep a low somatic cell count in your herd from milking equipment to teat dip to feed additives. However, none of these products can overcome cows in a dirty environment or poor milking procedures.

Seizing the Opportunity*. If you are dealing with a somatic cell count problem, here are a few things to consider in thinking about how to deal with the problem. Even if your SCC is low, take a few minutes to review these points yourself and also with your milking staff to keep producing low SCC milk.*

- ✓ ***Keep cows clean.*** You should strive to keep cows as clean as possible before they ever enter the milking area. Clean cows are not only exposed to fewer environmental mastitis bacteria, but they are also easier to clean prior to milking.
- ✓ ***Milk clean, dry teats.*** Communicate with your milkers to make sure they understand it is critical to milk clean, dry teats at all times paying particular attention to ensure that the teat ends are clean.
- ✓ ***Wear gloves.*** Because bacteria are less likely to adhere to gloves than rough, calloused skin, nitrile or latex gloves should be worn during milking. Contagious mastitis-causing bacteria, like *Staph. aureus*, may live on your hands and be transmitted between cows during milking. Gloves minimize

the spread of contagious mastitis between cows during milking and help protect the milker's skin. Gloves are also easier to disinfect than bare hands.

- ✓ ***Predip.*** Teats should be predipped with a sanitizing solution. Predipping eliminates bacteria on teat ends prior to milking and helps to control mastitis caused by environmental mastitis pathogens. When predipping, at least ¾ of the teat should be covered with a goal of covering the entire teat. The predip should remain on the teats for at least 30 seconds before drying.
- ✓ ***Dry cows within individual towels.*** Teats should be thoroughly dried with a single service, absorbent cloth or paper towel. Never use the same towel on two cows. Using the same towel on multiple cows increases the chances of spreading mastitis from cow to cow during milking.
- ✓ ***Post-dip.*** As soon as possible after the milking units are removed, teats should be dipped with a post-dip, demonstrated to be an effective germicide through independent research. An effective post-dip kills bacteria on teats and reduces the rate of new infections from contagious mastitis pathogens.
- ✓ ***Revise prep-lag time.*** Prep-lag time is the time between when teat surfaces are first massaged or fore-stripped until the milking machine is applied. Oxytocin, which causes milk letdown, reaches peak levels at 60 seconds after stimulation. Therefore, milkers should be attached within 1 to 1.5 minutes after teat stimulation. Coordinating milker attachment with milk letdown helps ensure that the milkers are attached during the time frame when milk flow is highest. Attaching milkers too soon or too late can result in excessive milking time or reduced milk yield.
- ✓ ***Culture high SCC cows.*** To get a handle on the situation, you need to collect milk samples from high SCC cows to determine the causative bacteria. High SCC cows can be identified through DHI or with a CMT (California Mastitis Test). This information can be used to alter mastitis control, prevention, and treatment options to fit your herd's conditions. Extra care and precaution are necessary during the collection process. By using strict, clean, aseptic procedures, bacteria from milk originating in the cow's udder and not the cow's teat end or hair, the sampler's hands, or the barn environment are collected. If the samples are not collected and transported correctly the culture results will not be of any diagnostic value. You should work closely with your veterinarian to submit milk samples to be cultured and to interpret the results.
- ✓ ***Cull chronically high SCC cows.*** Particularly in small herds, one or two cows can contribute a higher percentage of cells within a bulk tank. Often, removing a few cows can make a big difference in bulk tank SCC. If you have cows with consistently high SCC (even high producers), it may be more economical to cull them than keep them in the herd.
- ✓ ***Equipment check.*** Although it may be expensive, it would be worthwhile to have a thorough equipment evaluation performed to make sure your equipment is not contributing to your SCC issues.
- ✓ ***Treat dry cows.*** *A*ll quarters of all cows should be treated with an antibiotic at dry-off. The cow is most highly susceptible to mastitis immediately after dry-off. Thus, we want to give cows as much ammunition to fight off new infections during this period as possible. Without dry cow treatment, 8 to 12% of quarters will develop a new infection during the dry period. Dry cow treatment helps cure existing infections and prevents new infections from developing. Research also demonstrates that an internal teat sealant (i.e Orbeseal) will provide additional effective protection.
- ✓ ***Consider using a coliform mastitis vaccine.*** A coliform mastitis vaccine (i.e. J-5 Bacterin™, Mastiguard™, J Vac®, Endovac-Bovi®) will reduce the number and severity of clinical coliform mastitis cases, which are generally picked up from the cow's environment. Check with your veterinarian for recommended protocols for commercially available vaccines.

MILK Counts. MILK Counts is a joint programming effort between the University of Kentucky Dairy Extension Team and the Kentucky Dairy Development Council. The goal of this program is to provide technical and problem-solving assistance to dairy producers dealing with somatic cell count problems. If you are concerned about meeting the new 400,000 limits in the future and would like to get a head start in reducing your herd SCC, please contact your county extension agent, your Kentucky Dairy Development Council consultant, or me (jbewley@uky.edu or 859-257-7543).

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Other Dates to Remember:

July 13 Bowling Green District Dairy Show
July 22-24 Bowling Green Expo

Kentucky State Fair
August 19-29, 2010

Dairy Environmental Meetings
July 21 – Woodford County
July 22 – Metcalfe County

Kentuckiana Dairy Exchange Trip

August 3-4, 2010
Russellville, Kentucky
Registration $25/person

Registration Deadline: July 15th to Larissa Tucker
Block of rooms available at Quality Inn (270-725-9771)
Or EconoLodge (270-726-2488) under "Dairy Exchange"
For $72 per night. Participants are responsible for own
Room reservations