Managing Your Dairy Cows Feed Intake is Under Your Control

Cooperative Extension Service

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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.

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

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.

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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 at least 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 dairycows, 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 being fed. 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:: Generally speaking, 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.

7. .Genetics: Sires are now selected for increases in feed efficiency (the amount of feed consumed per amount of milk produced). These offspring eat less to produce the same amount of milk as another less feed efficient cow.