

# Feeding Dairy Cows During the Transition Period

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The transition period runs from two weeks prior to calving through two to four weeks after calving. Dairies that have not implemented sound feeding and management programs during the transition period often experience

- low peak milk yields
- excessive loss of body condition
- poor fertility
- metabolic disorders, such as fatty liver and ketosis
- digestive disorders, such as ruminal acidosis and displaced abomasum (DA)
- high veterinary costs
- high involuntary cull rates.

Nutrition is a key component of a good transition cow program. Its role in preventing metabolic disorders will be discussed in this paper. Feeding guidelines will also be presented.

## Body Condition at Calving

Cows should freshen with a condition score of 3.5. Over-conditioned cows, those that freshen with a condition score of 4 or 4+, undergo greater intake depression around the time of calving and don't have good appetites during the first few weeks after calving. Because of this, they are more prone to fatty liver, ketosis, DA's, ruminal acidosis, rapid and excessive loss of body condition, and poor fertility.

Thin cows, those that freshen with a condition score of 3 or 3-, simply don't have enough energy coming from back fat mobilization to support high levels of milk production. There is normally enough energy contributed from back fat mobilization in early lactation to support 500 to 1,000 kg of milk production.

Proper conditioning needs to be done mainly before dry off. Cows should not lose body condition during the dry period. The body condition that can be put on during a 45 to 60 day dry period is only about a half point. So, cows should have a body condition score of 3.0 to 3.5 at dry off.

## **Nutrition Prior to Calving**

Cows should be lead fed concentrates for two weeks prior to calving. Feeding starchy grain prior to calving:

- enhances dry matter and energy intake during the period of intake depression
- helps adapt the rumen microbes in preparation for the early postpartum diet
- increases the capacity of the rumen tissue for volatile fatty acid absorption
- increases ruminal propionate production.

This helps prevent loss of body condition and fatty liver prior to calving, ketosis, DA's, and ruminal acidosis. Intake of total concentrates, which include grain, protein supplement and mineral/vitamin supplements, should be limited to up to .75% of body weight or 4.5 to 5.5 kg of dry matter (DM) per cow per day. The non-fiber carbohydrate (NFC) content of this diet should be 35% to 40% (DM basis). Net energy (NEI) concentration of the total diet should be midway between the dry cow and milking cow diets or 1.55 Mcal per kg of dry matter. This provides for a step-up energy feeding strategy during the transition period.

This concentrate feeding guideline keeps about 50% of the diet dry matter as forage to help prevent DA's caused by low rumen fill. Feeding a total mixed ration (TMR) to help regulate the forage to concentrate ratio is recommended. The forage should be coarsely chopped, and feeding 5 lb. per cow per day of long or coarsely processed hay may aide this group. I recommend that corn silage be limited to less than 50% of the forage dry matter in this diet.

The crude protein (CP) content of this diet should be 12% to 14% (DM basis) with 35% to 40% of the CP as "bypass" protein. Sub-clinical and clinical milk fevers can be prevented by controlling the potassium content of this diet and lowering its cation-anion difference (DCAD) using anionic salts. Preventing sub-clinical milk fever helps prevent other calving-related disorders, such as retained placenta, ketosis and DA, and enhances early postpartum dry matter and energy intakes.

## **Maximizing Dry Matter Intake in Early Lactation**

Increasing dry matter intake during the first few weeks after calving increases energy intake during this period and minimizes the degree and duration of negative energy balance. Here are some tips for improving dry matter intakes:

- Feed good quality forages; RFV 150
- Feed palatable forages and concentrates
- Do not feed to an empty bunk; feed fresh cows for 5% to 10% refusal
- Push up feed frequently to stimulate appetites
- Feed the TMR or ensiled forages frequently enough to keep cool in the bunk
- Provide adequate bunk space; 2 ft. per cow for fresh cows

- Provide a special transition group and TMR for early lactation cows
  - 18% to 21% minimum NDF from forage
  - 28% to 32% minimum total diet NDF
  - 35% to 40% NFC
  - 1.68 Mcal NEI per kg diet dry matter
  - 17.5% to 18.5% CP with 35% to 40% of CP as bypass protein
  - total fat under 6% of diet dry matter
  - Feed coarsely chopped forages
  - Feeding 2.0-2.5 kg hay per cow per day may aide this group
- Keep barns well ventilated
- Keep cows comfortable
- Keep water tanks clean and allow cows easy access to them.

### **Feed Additives**

Numerous feed additives are targeted to transition cows by nutritionists for prevention of metabolic disorders and improvement of lactation performance.

Dietary buffers can increase milk yield and milk fat test. Use in early lactation diets relates to their role in maintaining high ruminal pH and fiber digestion, minimizing off-feed problems, and improving feed intake. Feeding guidelines for sodium bicarbonate and magnesium oxide are 110 to 220 grams per cow per day and 45 to 90 grams per cow per day, respectively. Sodium bicarbonate or sesquicarbonate should not be used in pre-calving diets because they will increase DCAD which may lead to more sub-clinical milk fevers.

Yeast products are often targeted to transition cows to stabilize the rumen environment as cows shift from low to high energy diets. There are now several research trials that show a benefit to including yeast products in diets for pre-fresh and early lactation cows.

Niacin supplementation has been shown to increase milk yield and milk fat and protein percentages. The common recommendation is for 6 grams of niacin per cow per day to pre-fresh cows and 6 to 12 grams of niacin per cow per day to early lactation cows. Interest with transition cows relates to its role in preventing ketosis through reduced fat mobilization.

Propylene glycol is a glucose precursor that elicits an insulin response and reduces back fat mobilization when administered to pre-fresh cows. It is generally administered as a once daily oral drench of 300 to 600 grams per cow for several days prior to freshening. Because of the difficulty with drenching cows orally, there is interest in adding propylene glycol directly to the pre-fresh diet. Administering propylene glycol mixed with 3.0 kg of concentrate and fed once daily was nearly as effective as the oral drench. Administering propylene glycol mixed in a TMR was not effective. Because of its high cost and administration difficulties, this additive is usually targeted to over-conditioned cows.

There is interest within the feed industry in using calcium propionate as a ration additive for transition cows. Research showing ruminal conversion of propylene glycol to propionate suggests the potential for a similar efficacy with calcium propionate. Calcium propionate also enhances bunk stability and may improve intakes where heating of the TMR in the feed bunk is a problem.