Dairy Focus at Illinois Newsletter

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Ten steps for a successful transition period: Part 2

The transition period (3 weeks before calving through 3 weeks after calving) has been considered by some researchers as the most critical and stressful phase of the lactation cycle. Nutrition and management of the dry dairy cow has been an area of extensive research over the last 25 years. Everyone agrees on its importance. So why are we still talking about the transition period? Sometimes we can get nowhere if not focusing on the right things. In the last issue of the Dairy Focus Newsletter, we gave the example that having a Special Needs Barn or a specific diet does not guarantee that the transition period program will be successful. We must focus on things that reflect relevant aspects of the transition period.

Our objective is to highlight practical outcomes to be measured that can help dairy farmers and consultants to keep track of the transition cow program. To do that, we have selected 10 indicators with our recommendations on where dairy farms should stand. We discussed the first 5 in the previous newsletter. Here are the last 5:

6. The Right Diet

Studies from the University of Illinois and others have shown that controlling energy intake during the dry period leads to better transition outcomes. The data collected demonstrate that cows fed even moderate-energy diets (0.68 to 0.73 Mcal net energy of lactation [**NEL**] per lb dry matter (**DM**)) will easily consume 40 to 80% more NEL than required during both far-off and close-up periods. Cows in these studies generally had a body condition score of about 3.0 at dry-off (on a 1 to 5 scale), were housed in individual stalls, and were fed diets based on corn silage, alfalfa silage, and alfalfa hay with some concentrate supplementation. We have no evidence that the extra energy and nutrient intake was beneficial in any way. More importantly, our data indicate that allowing cows to over-consume energy even to this degree may predispose them to health problems during the transition period if they face stressors or challenges that limit feed intake.

Years ago, a great deal of emphasis was placed on maximizing energy intake during the close-up or pre-fresh period in an attempt to improve energy balance. This approach was designed on the basis of research showing advantages in adaptation of the rumen microbial population and rumen papillae to higher nutrient diets fed after calving, decreased body fat mobilization and fat deposition in liver, and compensation for declining dry matter intake (**DMI**) as calving approaches. Although these ideas were sound and based on at least some supporting research data, the ability of higher-energy close-up or "steam-up" diets to minimize production diseases in research trials and field experience has been disappointing.

A workable solution to the potential for cows to over-consume energy is to formulate rations of relatively low energy density (0.60 – 0.62 Mcal NEL/lb DM) and high fiber that cows can consume free choice without greatly exceeding their daily energy requirements. The principle is to feed cows a diet of sufficient fiber (bulk) content that cows will only meet their requirements consuming all the DM they can eat. At the same time, it is critically important that the diet provide required amounts of metabolizable protein and all minerals and vitamins. The biggest reason that the bulky diets may not be successful on farms is improper ration preparation that leads to sorting and refusal of straw. Straw or other roughage added to control energy density must actually be consumed in the amounts desired. If cows sort out the straw or other high bulk ingredients, they will then consume too much energy from the other ingredients and the results may be poor.

7. Dairy Efficiency

In general, efficiency is a measurable concept, quantitatively determined by the ratio of output to input. For dairy cows, this means how much of the feed consumed by the cow (DMI) is converted into milk. The three most common dairy efficiency metrics are: lb of milk per lb of DMI; lb of fat-corrected milk (**FCM**) per lb of DMI; and lb of energy-corrected milk (**ECM**) per lb of DMI. We believe that the last two, which indicate not just milk volume but also milk composition, are more appropriate. A high number is not always the best. For instance, high dairy efficiency (FCM/DMI) for fresh cows could indicate excessive body adipose tissue mobilization represented in high milk fat and therefore high FCM. Our recommendations are in Table 1.

The Dairy Focus Lab has developed a dairy efficiency calculator (http://dairyfocus.illinois.edu/content/dairy-focus-toolbox) with an instructional video (https://www.youtube.com/watch?v=7C1YKuVfuI8) to make it easier to calculate the numbers for your farm. Check it out!

8. Fecal Scores

Over twenty years ago, researchers at Michigan State University developed a scoring system that is widely used to evaluate fresh manure. Manure consistency is dependent on water and fiber content, type of feed, and passage rate. The manure scores run from 1 (manure is very liquid with the consistency of pea soup; cows experiencing diarrhea would be in this category) to 5 (manure appears as firm fecal balls) with a score of 3 being optimal (Figure 1). Manure scores 1 and 5 are not desirable and may reflect a health problem besides dietary limitations. As cows progress through lactation, manure scores may also shift as follows:

- Fresh cows (score 2 to 2 ½)
- Early lactation cows (2 ½ to 3)
- Late lactation cows (3 to 3 ½)
- Far off dry cows (3 to 4)
- Close up dry cows (2 ½ to 3 ½)

Establish with your nutritionist a routine for fresh manure evaluation to ensure that diets are being well assimilated by your cows.

Figure 1. Manure with a score of 3 is the consistency of porridge, stands 1½ inches high and shows four to six concentric rings and/or dimples. It shows that the ration is balanced with an optimal rate of feed passage. (Photo credit: Jim Baltz, University of Illinois)

9. Cow Comfort: Hock Scores

Cows need to be comfortable to perform. To quote Dr. Gordie Jones (consultant): "*Milk is the absence of stress.*" Ideally, cows should spend the majority of their time lying down. The remainder of the time they would stand to be milked, to eat, and to drink. Hock problems are often the most noticeable cow comfort issue. Hock scores (1 to 3) are an easy and practical assessment of cow comfort. Cornell cooperative extension have developed a chart for hock assessment (Figure 2). If cows present with hock lesions (hock scores ≥ 2), there is a good indication that they are not lying down as much as they should. You should target to have > 95% of your cows with hock scores = 1 (no swelling or hair missing).

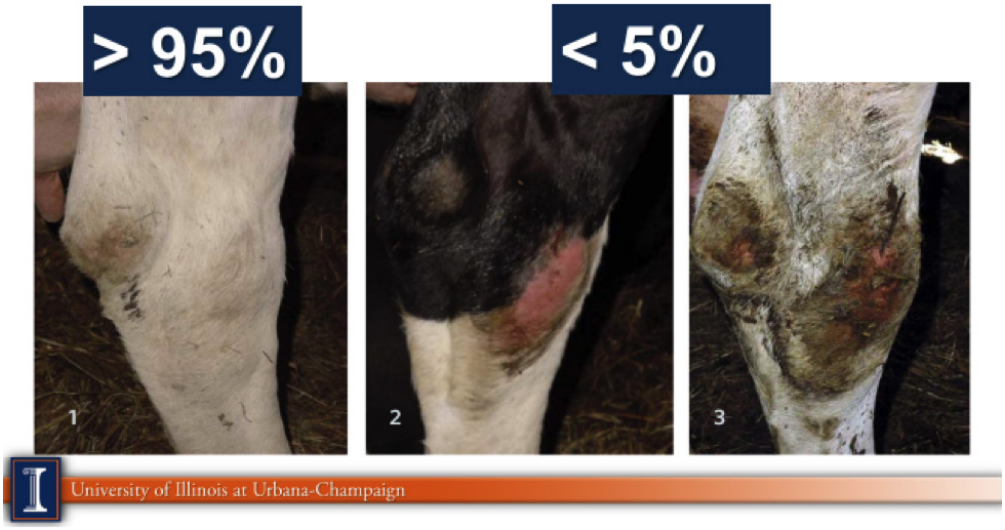

Figure 2. Hock assessment score goals for dairy cattle.

Adapted from (https://ahdc.vet.cornell.edu/programs/NYSCHAP/docs/HockScoringChart-NYSCHAP-4-04.pdf)

10. Cow Comfort: Activity

Activity monitors are commonly found in dairy farms nowadays. They usually can report individual cow data for daily lying time, steps per hour, rumination time, and number of bouts. Researchers from the University of Wisconsin and others have suggested a target of around 12 hrs/day for lying time. However, they reported that cows' observed lying time ranged from 2.8 to 17.6 hrs/day, with a mean of 11.3 hrs/day. Work from the Miner institute has suggested a linear relationship between time lying down and milk production on the order of a 2 to 3.5 lb increase in milk for each additional hour of rest. Providing cows with sufficient rest (e.g., lying time) is vital for cow comfort.

Table 1. University of Illinois guidelines for dairy efficiency (DE)

Group	Days in Milk	DE (ECM/DMI[1])
High group, mature cows	< 90	> 1.7
High group, 1st lactation	< 90	> 1.6
Low group	> 200	> 1.3
One group TMR herds	150 to 225	> 1.5
Fresh cows	< 21	< 1.5
Problem herds/groups	150 to 200	< 1.3

[1] ECM = energy-corrected milk; DMI = dry matter intake.

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