10 steps for a successful transition period

Phil Cardoso for *Progressive Dairyman*

Editor's note: This article is the second in a two-part series featuring 10 steps to a successful transition period. Steps 6-10 are discussed in this article.

In our previous article (*Progressive Dairyman*, February 25, 2017, pages 54-55) we started the conversation that nutrition and management of the dry dairy cow has been an area of extensive research over the last 25 years. The transition period (three weeks before calving through three weeks after calving) has been considered by some researchers as the most critical and stressful phase of the lactation cycle. So why haven't we stopped talking about the transition period? Perhaps sometimes we get nowhere if we're not focusing on the right things. We gave the example that only having a special-needs barn or a specific diet does not guarantee the transition period program will be successful. We must focus on things that reflect relevant aspects of the transition period.

Our objective in this second article is to highlight practical outcomes to be measured that can help dairy farmers and consultants keep track of the transition cow program. To do that, we have selected 10 steps with our recommendations on where dairy farms should stand. Here are the last five:

6 The right diet

Studies from the University of Illinois and others have shown controlling energy intake during the dry period leads to better transition outcomes. The data collected demonstrate cows fed even moderate-energy diets (0.68 to 0.73 Mcal NEL per pound dry matter) will easily consume 40 to 80 percent more NEL than required during both far-off and close-up periods. Cows in these studies generally were about a "3" body condition score 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 the extra energy and nutrient intake was beneficial in any way. More importantly, our data indicate 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 prefresh 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 (0.6 to 0.62 Mcal NEL per pound dry matter) and high fiber. 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 dry matter they can eat.

At the same time, it is critically important the diet provide required amounts of metabolizable protein and all minerals and vitamins. The biggest reason 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 another high-bulk ingredient, then

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they will 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 concept means how much feed consumed by the cow (DMI) is converted into milk. The three most common dairy efficiency metrics are pounds of milk per pound of DMI, pounds of fat-corrected milk per pound of DMI, and pounds of energy-corrected milk per pound of DMI. We believe 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 (fat-corrected milk/DMI) for fresh cows could indicate excessive body adipose tissue mobilization represented in high milkfat and, therefore, high fat-corrected milk. Our recommendations are in **Table 1**. Also, we have developed a dairy efficiency calculator video (www.youtube.com/watch?v=7C1YKuVfuI8) and a tool (www.dairyfocus.illinois.edu/content/dairy-focus-toolbox) to make it easier to calculate the numbers for your farm. Check them out.

8 Fecal scores

For quite a few years now, Michigan researchers have developed a scoring system widely used to evaluate fresh manure. Manure consistency is dependent on water and fiber content, type of feed and passage rate. A scale of 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) are the extremes, 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 their lactation, manure score may also shift as outlined below. Fresh cows (score 2 to 2½), early lactation cows (2½ to 3), late-lactation cows (3 to 3½), far-off dry cows (3 to 4) and close-up dry cows (2½ to 3½). Establish with your nutritionist a routine for fresh manure evaluation to make sure diets are being well assimilated by your cows.

9 Cow comfort: Hock scores

Cows need to be comfortable to perform. Quoting 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 be standing 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 has developed a chart for hock assessment (**Figure 2**). If cows present hock lesions (hock scores equal to or greater than 2), there is a good indication they are not lying down as much as they should. You should target to have greater than 95 percent of your cows with hock scores equal to 1 (no swelling or hair missing).

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 cows target around 12 hours per day for lying time. However, they reported that cows' lying time ranged from 2.8 to 17.6 hours per day with a mean of 11.3 hours per day. Work from the Miner Institute has suggested a linear relationship between time lying and milk production of the order of 2 to 3.5 pounds of milk increase for each additional hour of rest. Providing cows with sufficient rest (e.g.; lying time) is pivotal for cow comfort.

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TABLE 1 University of Illinois guidelines for dairy efficiency (DE)

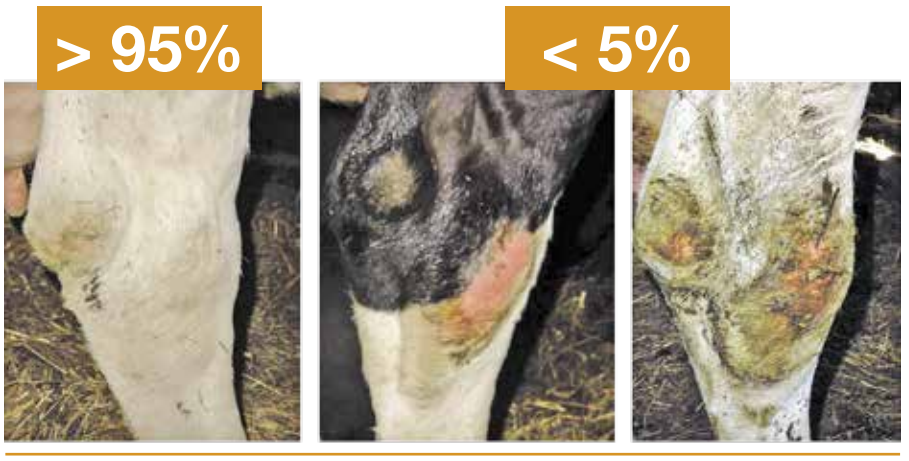
Group	Days in milk	DE (FCM/DMI)
High group, mature cows	< 90	> 1.7
High group, first lactation	< 90	> 1.6
Low group	> 200	> 1.3
One-group TMR herds	150 to 225	> 1.5
Fresh cows	< 21	< 1.5
Problem herds/groups	150 to 200	< 1.3

Source: University of Illinois at Urbana-Champaign

FIGURE 1 Manure score: 3

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

FIGURE 2 Hock assessment score goals for dairy cattle



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