Management Practices before Calving Help Prevent Fresh Dairy Cows from Becoming “Losers”

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Introduction

Successfully transitioning dairy cows back into the milking herd after the dry period is one of the most important pillars associated with well-performing and profitable dairy herds. The success of these nutrition and management programs directly relates to the reproductive performance, milk production, and health of cows during this next lactation. Essentially, transition cow programs need to be designed and managed to result in cows eating well after calving and entering lactation with no or very minimal health- and metabolic-related issues, such as metritis, milk fever, ketosis, or fatty liver.

As dairy researchers learn more about this vital time frame, they have found that subclinical diseases have a substantial impact on future reproductive and production performance and health, may often go undetected, and may be the underlying cause of suboptimum performance in dairy herds. The key becomes understanding when problems, even if they do not result in a diagnosed clinical disease, are occurring and then develop and modify management practices to prevent problems in the future. Dairy cows that suffer from these issues, whether clinically or subclinically, often are prematurely culled, and in Denmark, these cows are part of the complex that the Danes refer to as “loser cows.” The question we want to consider is how we can prevent early-lactation dairy cows from becoming "loser dairy cows.”

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Prevention starts in the previous lactation by preventing excessive body condition in later-lactation cows

Transition cows that are overconditioned (body condition scores are equal to or greater than 4.0) eat less before and after calving, with feed intake dropping sooner and to a greater extent before calving than optimally body conditioned pre-fresh cows. As a result, these cows mobilize body fat to a greater extent compared to cows where feed intake is not compromised as greatly before calving. This greater mobilization of body fat causes excessive fat to accumulate in the liver of these cows, which further compromises the liver's ability to make glucose to support milk production. Thus, these cows have a higher likelihood of developing fatty liver and then subclinical or clinical ketosis in addition to other metabolic disorders.

Feed intake of most cows decreases just before calving (generally less than 5 days before calving) which results in some mobilization of body fat. The key is the degree of mobilization of body fat. Overconditioned cows and cows whose feed intake is excessively reduced before or just after calving mobilize more body fat (more than 0.5 body condition score by 30 days in milk) and consequently accumulate more fat in the liver. Thus, this increased mobilization of body fat results in a higher incidence of fatty liver and thus subclinical or clinical ketosis as evidenced by elevated ketones and non-esterified fatty acids (NEFA) in the blood pre- and post-calving.

Oftentimes, these overconditioned cows were cows that experienced long days in milk due to reproductive problems during the previous lactation. In herds where later-lactation cows are becoming overconditioned, these late-lactation cows may need to be housed and fed separately where the energy content of rations is adjusted downward and more forages are fed to prevent these cows from becoming overconditioned. At the same time, adequate energy and nutrients (e.g., protein) need to be supplied to maintain good milk production. The key is to recognize the problem early and take corrective measures to prevent overconditioning of late-lactation cows.

Feed adequate but not excessive amounts of energy during the entire dry period

Overconsumption of energy during the dry period can negatively impact intake shortly before and after calving and can result in higher losses of body condition after calving. Both of these outcomes potentially increase the likelihood of metabolic diseases after calving and cows not milking as well during the next lactation. In addition, feed intake before calving impacts feed intake after calving, especially where feed intake drops sharply before calving. Studies have shown that cows with metritis after calving also had lower intakes before calving. Thus, it is critical to design feeding programs before calving that optimize intake.

Correctly sampling all forages for dry cows and using the test results to formulate rations are vital steps for avoiding overfeeding energy during the dry period. Overfeeding energy increases costs, but more importantly, it can negatively affect performance during the next lactation. Far- off dry cow diets are recommended to

contain about 0.60 Mcal NE_L/lb dry matter (calculated using the NRC model) and for Holstein cows provide 15 to 17 Mcal/day NE_L. To achieve these lower energy concentrations, especially when corn silage provides part of the forages, 5 to 10 lb of chopped (2 to 3 inches in length) wheat straw or high neutral detergent fiber (NDF) grass hay should be added and the consumption behavior of cows monitored to make sure the TMR is not sorted. These diets need to contain adequate amounts of fiber (i.e., NDF), but not excessive amounts as can occur when poor-quality forages are fed. For example, if the NE_L intakes are less than desired, the concentration of NDF is probably too high, and some of the high NDF forages need to be removed and replaced with other lower NDF forages. Likewise, if the NE_L intake is higher than desired, dietary NDF should be increased and more high NDF forage added.

Close-up dry cow diets should contain slightly more energy and metabolizable protein than far- off dry cow diets, but energy density still should be controlled to optimize intake after calving. Mineral balance of dry cow diets is critical to prevent problems after calving. Diets for dry cows 3 weeks before calving often contain lower potassium forages and grain products to allow for formulation of diets that prevent subclinical and clinical milk fever. Subclinical milk fever, lower blood calcium content without clinical signs, has been associated with higher risks of mastitis, retained placenta, metritis, and displaced abomasums.

Minimize stresses on close-up dry cows

Social, environmental, and metabolic stresses can negatively impact not only feed intake but also immune function and overall productivity and health of dairy cows before and after calving. Management practices that decrease these stresses include:

- **Providing adequate feedbunk space:** When feedbunk space is limiting, close-up dry cows may spend more time standing and eat less dry matter or eat larger and fewer meals. Cows that spend more time standing are more predisposed to lameness. To prevent potential problems with lameness and other metabolic disorders after calving, close-up dry cows should be provided with 36 inches/cow of feedbunk space. Plans for the total amount of bunk space provided should reflect the largest number of cows the facility will handle, not the average number of cows through the facility.

- **Providing adequate resting space:** Close-up dry cows need a clean, dry, and comfortable place to rest. Limiting the resting space increases the time cows spend standing and predisposes them to hoof issues and increased incidence of lameness after calving. During this time frame, cows naturally have a lower immune function and are more susceptible to infections, such as mastitis and metritis; thus, providing a clean, dry environment is critical. Each cow should be provided with a minimum of 1 well-bedded freestall (sand is the preferred bedding) or 100 square feet of bedded pack space. Again, facilities should be designed for the maximum number of cows to prevent overcrowding, not the average number of cows.

- **Minimizing number of pen moves or addition of cows to the group:** Each time new cows are added to a group the social hierarchy within the group is changed and must be reestablished. If herd size allows, cows should remain in the same group throughout the close-up period and, if possible, even established as a group early in the far-off dry cow period. For herds where this is not possible, new cows should be added no more frequently than once weekly to the close-up dry cow group. When possible, multiple cows, rather than single cows, should be introduced into a group together.

- **Minimizing heat stress:** Heat stress during the dry period decreases feed intake during the dry period and after calving, immune function after calving, and milk production during the next lactation. Providing fans and sprinklers to cool cows is critical during this time period and the entire dry period.

House springing heifers and mature cows separately, if possible

Heifers compete better with other heifers and have higher dry matter intakes and longer resting times when housed separately from mature cows. Diets for heifers then can reflect lower intakes (approximately 23 versus 26 lb/day dry matter intake) and the need for additional protein (15% crude protein or 1,200 g/day of metabolizable protein for springing heifers) during the close-up dry period over mature cows. In addition, heifers are not as likely to respond to the addition of anionic salts because they are less likely to have subclinical hypocalcemia (milk fever) than mature cows and the addition of anionic salts may reduce feed intake.

Prevention of metabolic disorders and optimizing feed intake after calving starts with implementing sound feeding and management practices not only 3 weeks before calving but throughout the entire dry period. Essentially, dairy cows that consume adequate dry matter pre- fresh (24 to 28 lb/day dry matter—Holstein cows) throughout the entire dry period have fewer metabolic issues (i.e.. ketosis) after calving, have a better immune system to fight off disease challenges (i.e., mastitis), and generally become care-free, early-lactation cows that rebreed easier. These dairy cows become “winners” and not “losers.”