

Building confidence in transition cow consulting

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Abstract

Nutrition can greatly impact the health and productivity of the lactating dairy cow. Nutrition and management during the dry period and immediately prior to calving have a tremendous impact on the success of the cow to transition into lactation. The veterinarian may be asked to intervene on individual sick cows with transition problems (i.e. ketosis, displaced abomasum [LDA], hypocalcemia) or evaluate a herd that has a higher incidence of transition cow disease than expected. Veterinarians should develop the skills necessary to consult producers on how to diagnose whether the transition cows are having a negative impact on herd health and productivity, evaluate the cause of the increased herd-level incidence, and recommend management and nutritional changes to correct the problem. This paper will primarily focus on clinical and subclinical ketosis prevention and its sequelae.

Key words: transition cow, ketosis, nutrition

Résumé

La nutrition peut avoir un impact considérable sur la santé et la productivité des vaches laitières en lactation. La nutrition et la gestion durant le tarissement et juste avant le vêlage ont un impact majeur sur le succès de la vache en transition vers la lactation. On peut demander au vétérinaire d'intervenir auprès de vaches malades avec des problèmes de transition (i.e. acétonémie, déplacement de caillette, hypocalcémie) ou pour l'évaluation d'un troupeau avec une incidence de maladie plus élevée qu'attendue chez les vaches en transition. Les vétérinaires devraient développer les compétences nécessaires pour aider les producteurs à déterminer si les vaches en transition ont un impact négatif sur la santé et la productivité du troupeau, pour les aider à évaluer la cause de la hausse d'incidence dans le troupeau et pour recommander des changements de gestion et d'alimentation pour corriger le problème. Cet article mettra l'accent sur la prévention de l'acétonémie clinique et subclinique et ses séquelles.

Diagnosing Transition Cow Problems

Various diagnostic tests are available to evaluate individual cows for clinical ketosis. Testing for acetoacetate in the urine or milk can be performed. Comparisons have been done evaluating the sensitivity and specificity of ketosis testing methodologies.¹ Laboratories can be utilized to measure beta-hydroxy butyric acid (BHBA); however, the lag time

from sample collection to receiving results makes this test impractical in many situations. The use of cow-side hand-held glucometer type devices have been used to measure BHBA, and studies have been published demonstrating the utility of the device for dairy cows.³ These devices can be used to measure BHBA on clinically ill cows as well as herd-level diagnostic screening.⁶ These tests can be performed on a population of at-risk animals to determine if a herd-based problem exists. A typical testing strategy would be to test animals twice during the first 7 to 10 days-in-milk (DIM). BHBA levels > 1.4 mmol/liter indicate subclinical ketosis. Herds with more than 15 to 20% of cows with elevated BHBA levels have higher rates of performance problems.⁴ In practice, this means that I would typically test 10 to 20 cows and intervene if 2 to 4 cows were above 1.4 mmol/liter. On small herds, routine monitoring of fresh cows with cow-side blood BHBA meters and recording results in a log can be useful to prevent outbreaks and gather enough data.

Workup of Herd-based Ketosis Problem

Once a herd has been diagnosed with an abnormal incidence of subclinical or clinical ketosis, the veterinarian can perform a systematic evaluation regarding risk factors predisposing the herd to these issues. An initial evaluation can be performed without a complete nutritional analysis; however, a full consultation should include an evaluation of the formulated ration. This paper will provide general steps to a herd-based workup for evaluating transition cow problems associated with ketosis. The size of the herd, use of a 1-group vs far-off dry and close-up pens, mixed parity pens, available feedstuffs, and individual management factors must be considered when applying these principles to individual farms.

Dry-Matter Intake Offered

Calculation of dry matter intake of each dry-cow group is a key component of the nutritional evaluation. Knowing what the cows are actually consuming is just as important, if not more important, than the formulated ration. First, review the mix sheet to make sure the producer or feed manager is mixing the ration as formulated. Review each feed ingredient and make an estimation of the amount of dry-matter pounds *being fed*. The goal for a one-group mixed parity pen is 27 lb (12.2 kg) of dry matter consumed.² The next step is to evaluate if the cows are consuming the amount fed or if there are any red flags that might indicate we are overestimating the amount of dry matter cows are consuming. For instance, the farm may be using "free choice long stem hay" and overestimating the amount consumed. In my experience, it is

difficult for cows to consume more than 10 lb (4.5 kg) dry matter of long-stem hay per day, depending on quality and management factors.

Energy

Controlling the amount of energy dry cows consume can greatly influence the success of transition. Feeding excess dry matter can result in overfeeding energy which will increase the risk of the cow to be hypersensitive to adipose tissue breakdown and ketosis. Controlled energy diets attempt to feed the correct amount of dry-matter intake that provides the correct amount of energy.² A goal for a controlled energy diet would be in the range of 0.59 to 0.63 Mcal Nel/lb of dry matter. The veterinarian should look at the formulated ration or input the feeds into ration software to calculate the predicted calories consumed. A common scenario is overfeeding corn silage to dry cows to increase dry-matter intake when hay quality is poor or scarce.

Management Factors Limiting Dry-matter Intake

There are several management factors that increase the risk of inhibiting dry matter intake.⁵ The 3 most common scenarios I have encountered include inadequate bunk space, overcrowding, and inappropriate pen moves. Dry cows should have 3 linear feet (0.91 m) of bunk space per head. If there are headlocks in the dry pens, but nowhere else for that management group, it might inhibit intakes, especially in heifers. Dry pens that utilize loose housing should have 100 square feet (9.3 square meters) of resting space per cow and ideally be stocked at 80% density. Moving animals between pens less than 3 weeks before anticipated calving can also inhibit dry-matter intake. For small herds, I recommend a 1-group dry pen to prevent inappropriate pen moves as well as utilize labor resources more efficiently. For larger herds that utilize a far-off and close-up pen, evaluate time spent in the close-up pen to determine actual days in close-up to determine if inappropriate pen moves are a risk factor. Overconditioned cows also have an increased risk for ketosis. Often this can be linked to reproductive problems, resulting in cows that spend too much time in late lactation putting on an excessive amount of body weight before the dry pen. This can also be seen with excessive dry period length (> 70 days). Culling reproductive failures is often a better strategy vs investing resources into animals at high risk of failure in the first 60 DIM.

Dietary Recommendations

I have had the best success managing transition cows with 1-group dry pens on a controlled energy diet.² It is imperative that if a high-fiber/low-energy ration is used, forages must be chopped to ensure appropriate dry-matter intake. Two common scenarios I have seen fail are excessive corn silage or haylage feeding and feeding long-stem dry hay

of poor quality. I follow the guidelines from Drackley² for formulating these rations which includes:

- DMI of 27 lb (12.2 kg) per day;
- Energy density of 0.59 to 0.63 Mcal Nel per day;
- Protein of 1000 to 1200 grams per day of metabolizable protein (MP);
- Starch content of 12 to 16% on a dry matter basis;
- Forage neutral detergent fiber (NDF) of 40 to 50%.

These diets are typically composed of corn silage and chopped straw with a protein supplement, and balanced for dietary cation-anion balance (DCAD). The straw must be chopped to 1 to 1.5-inch (2.5 to 3.8 cm) chop length. I have found the easiest way to do this is to pre-chop it prior to it going into the mixer. My clients have utilized silage bags for chopped straw after harvesting it through a forage processor as well as storing in a commodity shed.

It is critical that the ration offered provides adequate dry-matter intake and that no management factors inhibit access to the feed. These farms often utilize just-in-time calving, where cows are moved to calving pens when feet are showing.

Some farms will experience low volume of colostrum with these dry-cow diets. I have anecdotally found that ensuring adequate starch and protein intake will correct this problem. If the cows are producing 1 gallon of colostrum, I do not intervene.

Conclusions

Veterinarians are often the only consultant on the dairy that has oversight of many areas of the farm operation. This can include cow health, productivity, judicious use of medication, treatment protocols, individual animal treatment, and employee training. Offering transition cow consulting, due to its inherent effects on cow health and productivity, is an ideal first step to nutrition consulting for the recent graduate veterinarian. Specific dietary formulations and ration balancing are not requirements to evaluating transition cow problems. Evaluating dry-matter intake and management factors can occur cow-side during a routine herd visit. Including the nutritionist in these conversations is imperative to developing a team approach with the best interests of the dairy producer in mind. Continued monitoring of BHBA levels in fresh cows as well as performance indicators, such as peak milk production, will help to ensure continued success of the transition cow program.

References

1. Carrier J, Stewart S, Godden S, Fetrow J, Rapnicki P. Evaluation and use of three cow-side tests for detection of subclinical ketosis in early postpartum cows. *J Dairy Sci* 2004;87:3725-3735.
2. Drackley JK, Janovick-Guretzky N. Controlled energy diets for dry cows. *Proceedings. Western Dairy Management Conf* 2007.
3. Iwersen M, Falkenberg U, Voigtsberger R, Forderung D, Heuwieser W. Evaluation of an electronic cowside test to detect subclinical ketosis in dairy cows. *J Dairy Sci* 2009;92:2618-2624.

4. McArt JA, Nydam DV, Oetzel GR, Overton TR, Opsina PA. Elevated non-esterified fatty acids and β -hydroxybutyrate and their association with transition dairy cow performance. *Vet J* 2013;198:560-570.

5. Nordlund K, Cook N, Oetzel G. Comingling dairy cows: Pen moves, stocking density and health. *Proceedings. Annu Conf Am Assoc Bov Pract* 2006;39:36-42.

6. Oetzel G. Monitoring and testing dairy herds for metabolic disease. *Vet Clin North Am Food Anim Pract* 2004;20:651-674.