



HOW TO PICK THE RIGHT CLOSE-UP DIET

No one likes to treat a sick cow. And having to treat a sick cow following calving means something in your transition period system failed. Hypocalcemia, both clinical and subclinical, occur all too often, but they are highly preventable. When you prevent low blood calcium you also minimize the health problems that often follow.

Milk fever increases the risk of eight other periparturient diseases and is often considered the “gateway” disease process for poor transition performance, explains Robert Van Saun, extension veterinarian at Penn State University. Decades of research have demonstrated the negative effects of hypocalcemia. And it’s not just clinical milk fever you have to be concerned with; newer research indicates that subclinical hypocalcemia predisposes multiparous cows to less milk production, more disease risk and increased risk of involuntary culling. But it doesn’t have to be that way.

Take for example, a Pennsylvania dairy that had milk fever prevalence upwards of 15% in multiparous cows. Blood analysis indicated a >50% prevalence of subclinical hypocalcemia (<8.0 mg/dl) in multiparous cows. An investigation revealed a change in the forages fed to the dry cows and that the dairy was using a mixture of nutritional practices including a partial DCAD diet and feeding high dietary calcium. To correct the problem forages were tested for mineral content, then the dietary DCAD was calculated at 0 mEq/kg dry matter, dietary magnesium was increased and dietary calcium was reduced to 0.95%. The prevalence of all periparturient diseases was dramatically reduced—milk fevers declined to <5%. Intervention was warranted in this case because of the high prevalence of milk fever in the herd.

Every dairy should evaluate their transition cow program and ask if they can do better. Many nutritionists today report that they can achieve <3% milk fever prevalence and <20% subclinical hypocalcemia in well managed herds using negative DCAD diets.

PICK YOUR STRATEGY

Transition-cow nutrition is not one-size-fits-all. Nutrition for transition cows should be tailored to each dairy. You must consider the forages available, the management level of the dairy, capabilities of the staff and feeding system to provide consistent mix and delivery of feeds—especially if using an anionic supplement, the facilities available

for grouping dry cows, how many cows will calve per month and the potential for overcrowding or increased stress during the transition period, says Van Saun. All of these factors impact the success or failure of a transition cow program. You also need to identify which metabolic diseases occur during the transition period and their prevalence. The nutritional remedy for milk fever and ketosis are not the same. That’s why you need a good understanding of which problems occur in transition cows before making a nutritional change.

For dairies with clinical and subclinical hypocalcemia, research and on-farm use has clearly shown the many benefits of feeding negative DCAD diets to close-up cows, says Van Saun. Three nutritional strategies for DCAD have emerged for close-up dry cows: 1. Not feeding an anionic supplement, instead focusing on lowering the DCAD by feeding low potassium and low sodium forages. 2. Feeding enough anionic supplement to reduce the calculated DCAD to about zero. 3. Feeding enough anionic supplement to create a negative DCAD diet and induce a state of metabolic acidosis in the cow.

Producers in areas that can grow low potassium and low sodium forages may opt for just reducing the dietary potassium load, with no anionic supplement. With this strategy, you need to keep the dietary calcium level as low as possible, meaning little or no high-calcium forages, and no calcium supplements. This results in a calculated DCAD of about +100 mEq/kg of DM which results in a urine pH of 8.3 to 8.5. This strategy may reduce clinical milk fevers, but subclinical hypocalcemia often remains above desirable levels.

Adding some anionic supplement, sufficient to reduce the calculated DCAD to about 0 mEq/kg DM, should result in a urine pH of about 7.5 and is a good intermediate step in the right direction toward reducing some transition cow issues. However, recent research by Koszewski and Goff (2018) suggests that transition cows don’t start experiencing benefits from added anions until the urine pH drops below 7.5. Keep added dietary calcium to a minimum, and keep dietary phosphorus at 35 grams/day or less. Increase magnesium to 0.45%. This strategy is a small step that allows people to try anionic supplements, and see some reduction in clinical milk fevers.

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However, feeding an even lower DCAD diet that creates a mild, compensated metabolic acidosis with a urine pH of 6.0 to 6.5 is the strategy that yields the most benefits to the cow. For this strategy, the calculated DCAD is about -50 to -100 mEq/kg of DM. Some supplemental calcium is advisable, although the exact amount has yet to be firmly established by researchers. Anywhere between 60 and 120 grams per day should be sufficient, without negatively impacting feed intake. In addition, keep phosphorus intake under 35 grams per day and increase magnesium to 0.4 to 0.5%. Urine pH should be checked weekly and DCAD supplementation adjusted if needed.

These strategies are a progression from no negative DCAD to a level of negative DCAD sufficient to create a mild metabolic acidosis. Each strategy is unique. To get good results you must adhere to the strategy selected. Do not try to mix the nutritional aspects of two different strategies, stresses Van Saun. For example, do not feed high dietary calcium to cows that are not metabolically acidified. If you start with one strategy and don't see the results you want, then you must follow all of the steps of the next strategy you select.

Each of the three strategies requires a little bit more in terms of labor and management. That's why it is important to understand the day-to-day requirements, cost and potential benefits of each before you try. Talk to your veterinarian and nutritionist about which strategy would be best to improve calcium homeostasis and transition cow success on your dairy.



HAPPENINGS

Webinar Helps Solve the Riddle of RUP

Ruminally undegradable protein (RUP) is an important factor when selecting the right bypass protein for you or your client's ration. But understanding how to interpret RUP values and apply that to feedstuff selection can be confusing.

The SoyPlus team recently hosted a webinar to help address the common misunderstandings and questions heard in the field about RUP analysis.

SoyPlus Regional Sales Manager Brandon Finke and SoyPlus Technical Director Dr. Tim Brown shared their insights, including:

- + Defining what RUP is and is not.
- + Why higher RUP values don't mean better values.
- + The numerous methods used to derive RUP values and how to evaluate those values.
- + How RUP is utilized in ration modeling programs.
- + Where to go to get the best information about RUP in feedstuffs and what you should expect from your feed manufacturer.

Get answers to other questions about RUP by watching the full webinar recording here https://www.youtube.com/watch?v=6vOi2msKL_8 For more information about SoyPlus and other quality feed ingredients manufactured by Landus Cooperative, visit www.DairyNutritionPlus.com



FROM THE MATERNITY PEN

Create a Responsive Cow

About 50% of cows have at least one health problem post-calving. As a result, these cows also have reduced milk yield, reduced fertility and increased risk of culling or death. In order for your cows to have a healthy transition into lactation you must prepare them.

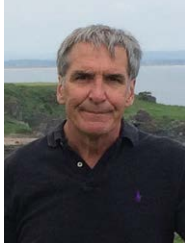
The dry cow program should be designed to create a responsive cow, explains Linda Baker, associate professor of clinical dairy production medicine at the University of Pennsylvania Veterinary School. A responsive cow has the ability to adapt to the sudden decline in plasma calcium that occurs at calving and quickly return to normal calcium homeostasis. Control of the pre-fresh diet is the best way to improve calcium homeostasis at calving. Whether you prefer to manipulate the dietary cation-anion difference (DCAD) or to feed a low-calcium diet is your choice. But if you choose to do nothing, your cows pay the price.

With a low-calcium diet, no supplemental calcium is used, and low-calcium ingredients should be selected to achieve the lowest possible calcium content (less than 0.5% DM). With a moderately negative DCAD diet urinary pH is reduced to between 6.0 and 7.0. Both options help cows be better equipped to respond to the blood calcium drop that occurs at calving. Additionally, dry cows need to be fed enough magnesium (>0.45% DM), enabling the parathyroid gland to do its job by secreting parathyroid hormone (PTH), which triggers increased calcium mobilization from the bones and enhanced intestinal absorption of dietary calcium. When magnesium is low, the kidney and bones are less responsive to PTH. Higher dietary magnesium is protective against hypocalcemia. Dietary phosphorus should be kept low (<0.35% DM) because high phosphorus increases the risk for milk fever/hypocalcemia.

Hypocalcemia and the complex of other health problems that often follow are highly preventable. Getting the minerals in balance in the close-up diet can help create a responsive cow and lead to healthier transitions, more milk production and less culling of cows from the herd.

CONSULTANTS CORNER

Use Standard Deviation to Improve Ration Formulation



BILL WEISS
Ohio State University

Ration formulation done correctly can help reduce feed cost, maintain high milk production and even reduce the amount of nutrients excreted in manure. We feed pens of cows. But to improve ration formulation we must also focus on the needs of the individual cows in each pen. That's where standard deviation comes in.

Standard deviation (SD) is a measure that is used to quantify the amount of variability within a group as opposed to using the average of a pen. (Spreadsheets such as Excel can easily calculate SD.) The primary cow inputs used in ration formulation software are body weight, milk yield, milk composition and parity. In pens with one breed of cow, generally the pen or breed average for body weight is adequate. However, milk yield, milk fat and milk protein can vary greatly among cows within a pen. And yields of milk and milk components have a substantial impact on the amount of energy and protein needed in the diet. Using average milk yield for the pen generally results in some cows being underfed and others being overfed. Both can have negative consequences on the cow and on your bottom line. Many nutritionists formulate diets for average milk yield plus an arbitrary increase, for example +10 lbs milk per day. However, using standard deviation for milk yield of a pen should result in more accurate diet formulation than using a pen average for milk yield.

The other big difference between individual cows in a pen is dry matter intake (DMI). Milk yield is positively correlated with DMI. If you exclude cows that are fresh less than 30 days in milk, then cows that produce more milk eat more feed. Therefore when a diet is balanced for the average of the pen, greater intake will support greater than average milk yield. But you can't rely on more intake of an average diet to meet the needs of high producing cows.

Let's look at an example with a group of cows that averages 80 lbs/milk/day. Based on NRC 2001 requirements DMI is expected to be about 54 lbs/cow/day. The diet is formulated to meet net energy lactation (NE_L) and metabolizable protein (MP) requirements for the average cow producing 80 lbs/milk/day. A cow producing 95 lbs/milk/day would be expected to eat about 60 lbs of dry matter each day but the average diet would only provide enough NE_L and MP to support 90 lbs/milk/day. Using the same assumptions, a cow producing 150 lbs/milk/day fed a diet formulated for the pen average of 80 lbs/milk/day would decrease milk production by about 25 lbs/day. High producing cows can't consume enough of the average diet to support high milk production, so milk production declines. You clearly don't want to formulate diets for the average of the group.

Assuming a typical feed cost to milk price ratio, no cows less than 30 DIM in the pen, and a bell-shaped distribution of milk yields within a pen, research shows that MP allowable milk should be about 1 SD above mean milk for the pen (Weiss, 2014; Cabrera, 2016). When cows are grouped by milk production, the SD for milk yield within the pen will be less than if the cows are grouped by any other criteria. Grouping cows by milk production and using standard deviation to determine nutrition needs of the cows in each pen can improve ration formulation, maintain milk production and limit the amount of excess MP fed which can help control feed cost and reduce excess nutrients in manure.

To learn more on the topic, please read my paper "Incorporating Diet and Pen Variation into Ration Formulation" at <https://bit.ly/2YINcBs>



BEYOND BYPASS

New Research on AA and Milk Protein Synthesis

Amino acids are building blocks for protein synthesis and function as signaling molecules. While research has clearly demonstrated that lysine and methionine are both limiting amino acids for milk protein synthesis, several other amino acids have the potential to impact animal performance, too. Ongoing research continues to shed light on the question of how best to balance dairy cow diets to provide cows with the right mix of amino acids.

New research reported in the June 2018 *Journal of Dairy Science* evaluated if bovine mammary cells responded to increases in the availability of the amino acids threonine, isoleucine, valine and leucine when the ratio of lysine to methionine was held constant at about 3:1. In the study, increasing the availability of valine relative to lysine was shown to further stimulate casein synthesis. Valine was able to enhance or upregulate intracellular signaling mechanisms within bovine mammary cells that are responsible for milk protein synthesis regulation.

In addition to valine, the data in this study showed that increases in the ratios of threonine to lysine, isoleucine to lysine and leucine to lysine, while keeping the ratio of lysine to methionine constant, could all potentially affect milk protein synthesis. These results add to the growing evidence that shows essential amino acid ratios can affect milk protein synthesis in part by regulating intracellular metabolism. More research should be conducted in vivo to further test the effectiveness of these treatments. To read the full study, go to <https://doi.org/10.3168/jds.2017-13707>



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QUALITY CORNER

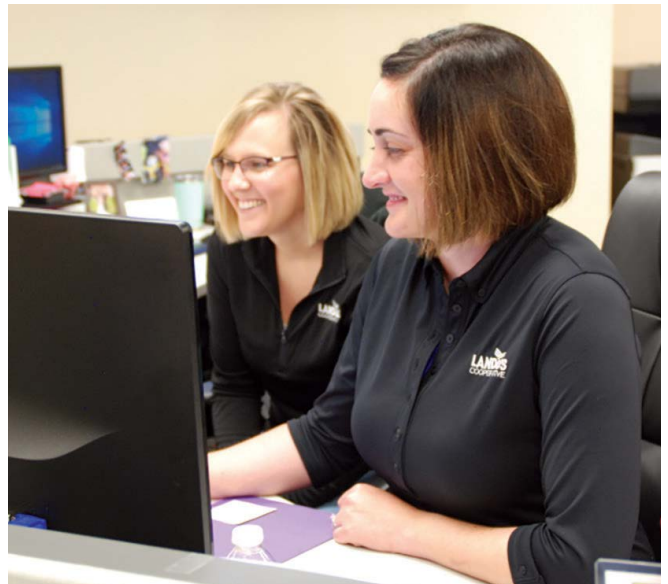
Service Beyond Nutrition

Customer service is more than just a job for Caitlin Stephenson and Kayla Irlbeck. Providing quality service to SoyPlus and SoyChlor customers is the value that drives what they do every day. "Our customers are the driving force behind our company," said Irlbeck. "They are our top priority when doing business each and every day."

Based out of Landus Cooperative's Ralston, Iowa, location, Stephenson and Irlbeck work closely together to oversee timely product shipments, answer customer questions and offer quality service beyond nutrition to SoyPlus and SoyChlor customers worldwide. A combined twelve years of experience has instilled in Stephenson and Irlbeck the importance of offering customers honesty, integrity and respect. "Our customers deserve upfront and honest service, without having to ask. I am here to listen, inform and provide support in any way I can," Stephenson said.

"As customer service representatives, we must keep each customer's best interest in mind to foster a good relationship," said Irlbeck. "Being polite and making personal connections with our customers is important to us and how we do business."

Stephenson and Irlbeck love the opportunity to communicate each day with people working in agriculture all over the United States and world. "Corresponding with people around the globe on a daily basis, coupled with the positive atmosphere in the office, is what makes my job so enjoyable," Stephenson said.



Learn more about the team supporting SoyPlus and SoyChlor service at <http://www.dairynutritionplus.com/Our-Team/>