



NUTRITION PLUS NEWSLETTER

IN THIS ISSUE

You Can Prevent Mineral Disorders in Transition Cows

Happenings |
SoyPlus Plays Role in Sustainable Agriculture

From the Maternity Pen |
Rumination Time Associated with Persistent SCH

Consultants Corner |
Cows Need 21 to 28 Days in Prepartum Group

Beyond Bypass |
Corn Plus RPL Can't Beat SBM and SoyPlus

Quality Corner |
Consistency and Quality Drive Everything We Do

YOU CAN PREVENT MINERAL DISORDERS IN TRANSITION COWS

While treating a cow with IV calcium has become a rarer occurrence on many farms these days, hypocalcemia is still a big deal, says Jesse Goff, veterinarian and professor emeritus, Iowa State University. When 50% of multiparous cows develop subclinical hypocalcemia and nearly 3% of multiparous cows require treatment for milk fever, that's a big deal, and it impacts your bottom line.

The day before calving a cow needs about 18 grams of dietary calcium for maintenance and fetal development. On the day of calving a cow needs about 50 grams of dietary calcium. That's an additional 32 grams of calcium needed to produce colostrum and avoid hypocalcemia. The cows' endocrine system, based on parathyroid hormone (PTH), signals the body to restore calcium homeostasis. As a result, the kidneys stop excreting calcium in the urine, vitamin D is converted into a hormone that enhances diet calcium absorption and bones release calcium into the bloodstream. In cows fed an alkaline diet, blood and urine pH is elevated (urine pH > 7.75), which means bone and kidney tissues are less responsive to PTH, and many cows fail to mobilize the additional 32 grams of calcium needed and develop hypocalcemia.

But when cows are fed an acidogenic diet, the cows move into a state of mild metabolic acidosis which increases tissue responsiveness to PTH signals. That's why acidified cows can pull more calcium immediately from their bones compared to non-acidified cows. They also begin absorbing dietary calcium faster. Properly acidified cows generally mobilize the required calcium to meet the 32 gram increase in demand imposed by colostrum and milk production the day after calving. The level of DCAD fed determines blood pH which is reflected in urine pH. Research has shown that the optimal urine pH needed to provide benefits for the transition cow is 5.8 to 6.8. Within that range, "My sweet spot for urine pH is 6.2 to 6.3," says Goff. This is an average for the group, not for each cow. Dry matter intake varies within a group of cows, and it only takes a 1 lb difference in DMI to alter urine pH.

With a group average for urine pH of 6.2 to 6.3 all cows are in a state of compensated metabolic acidosis. If you aim for a lower group average for urine pH, 5.5 to 6.0, some cows will become over acidified. These cows reduce intake because eating less of an extremely acidified diet is the only way cows can avoid developing life threatening acidosis. From all of the research and on-farm experience so far, "I can't see any benefit to push cows' urine pH below 6.0," stresses Goff. "I don't want to run the risk of over acidifying the cows and have them stop eating."

During the transition period keeping cows eating and maximizing DMI is so important. Feeding an anionic product instead of traditional anionic salts also helps increase DMI. The palatability and consistency of anionic products, such as SoyChlor which utilizes chloride as anion source rather than sulfate, boosts prepartum cows' DMI by 2.5 to 3 lbs/day over traditional anionic salts.

CALCIUM AND MAGNESIUM

The amount of dietary calcium fed also impacts urine pH. Calcium is a cation and therefore alkaline. So, if you feed anions to produce a mild metabolic acidosis and feed high levels of dietary calcium in the form of limestone, greater than 1% of diet DM, that extra calcium works against the anions. When aiming for a target urine pH of 6.0 or less, feeding high levels of dietary calcium may rescue cows from over acidification. However, it also means you are paying more to feed extra calcium that your cows don't need and paying more to feed additional anions to reach your desired urine pH, says Goff. That is not his preferred strategy. Current research recommends a range for dietary calcium between 0.7 and 1.3% of diet DM. In diets Goff formulates he prefers to keep calcium in the lower end of that range with a group urine pH of 6.2 to 6.3.

Magnesium is another important aspect of hypocalcemia prevention. Inadequate magnesium in the prepartum diet impedes calcium mobilization from the bone. In the transition diet very soluble sources of magnesium, such

continued from page 1

YOU CAN PREVENT MINERAL DISORDERS IN TRANSITION COWS

as magnesium chloride or magnesium sulfate, should be fed at 0.3% of diet dry matter (0.4% if MgO is primary Mg source). After calving, when cows are switched to the lactating diet, a cheaper and less soluble magnesium like magnesium oxide is often fed. After the switch it can take cows 7 to 10 days to get their magnesium levels back up to normal. Hypomagnesemia can decrease DMI and lead to secondary milk fevers during lactation. If feeding magnesium oxide look for one that is finely ground with small particles that can be quickly absorbed by the cow.

Another key point is your dry cow pen. If you have the ability to separate multiparous cows and first-calf heifers during the close-up period, do so. First-calf heifers don't benefit from negative DCAD diets like multiparous cows do, and they actually lose a little bit of milk production that first lactation if fed anions. The compromise in a mixed pen, Goff says, is to not push urine pH so low. Instead feed for the upper end of the optimal range for urine pH. This still provides the health and production benefits to multiparous cows but can minimize the negative impact on heifers.

PREVENTION PAYS

"It still surprises me when I visit a farm that has no control measures in place to prevent hypocalcemia," says Goff. "They IV cows for milk fever, but none of the proven control measures to prevent hypocalcemia are in place—feeding a negative DCAD diet, space for all cows to eat at once, good cow comfort and cow management."

When you have a good transition cow management program that includes a negative DCAD diet it is money well spent. The payback is easily 3:1, says Goff. By using production data from the Santos et al. (2019) meta-analysis and rounding for easy math, a milk production increase of 3 lbs/day for multiparous cows yields an additional 900 lbs of milk per cow for a 305-day lactation. At \$17/hundredweight that's about \$153 in extra milk income from feeding a negative DCAD diet. You could spend \$50 per cow on prevention and still have a 3:1 return. Anionic products, such as SoyChlor, cost about \$15 to \$20 per cow. Even if you give multiparous cows a couple of calcium bolus after calving at \$6 each that's an additional \$12 per cow. Total spent on prevention is \$32. That's a profit of \$121 per multiparous cow. Add in the value of improved cow health including fewer milk fevers, fewer retained placenta and displaced abomasum and it makes feeding a negative DCAD diet to parturient cows a home run.

HAPPENINGS

SoyPlus Plays Role in Sustainable Agriculture

As we lean into the future of agriculture, sustainability will continue to be a pillar at Landus. As sustainability in agriculture becomes more defined, it brings us back to the start of launching SoyPlus. By feeding a product that reduces overall protein consumption by the cow, SoyPlus can be thought of as the original sustainable ingredient for dairy rations. Manufactured with locally sourced beans using a 100% natural, chemical free process, we are able to provide a product that is good for your cows and our environment. Stay on the lookout as we unveil our next steps on sustainability for SoyPlus!



FROM THE MATERNITY PEN

Rumination Time Associated with Persistent SCH

New research presented at the American Dairy Science Association meeting in July indicates that periparturient activity and rumination time are associated with the dynamics of postpartum subclinical hypocalcemia (SCH).

Cornell University researchers conducted a study on 2 New York dairies with 89 multiparous Holstein cows. Starting at 10 days prior to calving, cows were monitored for urine pH, activity, rumination time and serum total calcium (tCa). Based on mean serum tCa at 1 and 4 days in milk (DIM) cows were classified into the following SCH groups: normocalcemic >1.89 mmol/L at 1 DIM and >2.25 mmol/L at 4 DIM; transient SCH <1.89 mmol/L at 1 DIM and >2.25 mmol/L at 4 DIM; delayed SCH >1.89 mmol/L at 1 DIM and <2.25 mmol/L at 4 DIM; and persistent SCH <1.89 mmol/L at 1 DIM and <2.25 mmol/L at 4 DIM. Cows were monitored through 10 DIM. Analysis of changes over time revealed the following differences between SCH groups:

- Delayed SCH cows had numerically lower prepartum urine pH, 6.15 compared to 6.44, 6.52 and 6.47 for normocalcemic, transient and persistent SCH cows, respectively.
- Prepartum rumination time was lowest in persistent SCH cows at 481.9 min/day compared to 513.6, 511.0 and 520.3 for normocalcemic, transient and delayed SCH cows, respectively.
- Postpartum rumination time was numerically lower in persistent SCH cows at 467.1 min/day compared to 499.8, 496.4 and 485.8 for normocalcemic, transient and delayed SCH cows, respectively.
- Postpartum activity was greatest in normocalcemic cows at 467.4 min/day compared to 429.9, 428.6 and 421.4 min/day for transient, delayed and persistent SCH cows, respectively.

These results indicate that low rumination time prepartum is associated with persistent SCH in cows, and this difference follows numerically into the postpartum period. More research is needed to determine if low urine pH prepartum is associated with delayed SCH in cows.

Seely et al., 2021. J. Dairy Sci. Vol. 104(Suppl. 1) p 73 Abstract 188.

CONSULTANTS CORNER

Cows Need 21 to 28 Days in Prepartum Group

BY JOSÉ SANTOS, University of Florida



Decades of research has identified how much of individual nutrients prepartum cows need and how best to formulate and deliver that diet during the last few weeks of gestation, but the optimal number of days to feed prepartum diets has not been clearly defined. Nor do we know if the number of days spent in the prepartum group should be the same or different for nulliparous (having their first calf) and multiparous cows. New research from the University of Florida provides some answers.

The observational and epidemiological study tracked performance of 18,657 cows on 2 California dairies over multiple years. Cows with a gestation length shorter than 256 days, longer than 296 days or those that spent 0 days in the prepartum group were excluded. That left 18,021 cow records to analyze for associations between the number of days spent in the prepartum group with milk production, health, reproduction and survival. Results clearly demonstrate that the number of days in the prepartum group impacts milk production, cow health, reproduction and survival. The data also indicate there is a range of optimal number of days that cows should spend in the prepartum group.

Both farms grouped nulliparous and multiparous cows separately during the prepartum and lactation periods. All cows received a similar prepartum diet. The one difference was that multiparous cows were fed an acidogenic product to minimize the risk of hypocalcemia, which was not offered to nulliparous cows. After calving, all cows were fed the same early-lactation and lactation diets.

MILK YIELD

Increasing the days spent in the prepartum group from 7 to 28 increased daily milk yield by 3.3 lbs/day for nulliparous cows and by 7.7 lbs/day for multiparous cows. However, when days in the prepartum group increased from 28 to 42, milk yield decreased. The plateau for daily milk yield was reached when nulliparous and multiparous cows spent 24 and 25 days in the prepartum group, respectively.

In terms of total milk yield for the 300-day observation period, increasing days in the prepartum group from 7 to 28 increased total milk yield by 736 lbs for nulliparous cows and by 2,321 lbs for multiparous cows. Total milk yield reached a plateau when nulliparous and multiparous cows spent 21 and 24 days in the prepartum group, respectively.

HEALTH EVENTS

Interactions between days in the prepartum group and parity/diet were observed for retained placenta, metritis, lameness and morbidity. Incidence rates varied with the number of days spent in the prepartum group. For retained placenta, the smallest incidence was observed when cows spent 27 days in the prepartum group. For metritis, the smallest incidence for nulliparous and multiparous cows occurred with 9 and 26 days spent in the prepartum group, respectively. The smallest incidence of lameness in nulliparous and multiparous cows occurred with 9 and 25 days spent in the prepartum group, respectively. Morbidity during the first 90 days in milk was smallest in nulliparous cows with 9 days in the prepartum group compared to 23 days for multiparous cows.

Days in the prepartum group also impacted reproduction. At 300 DIM, the proportion of pregnant cows was greatest when the days spent in the prepartum group was 19. And in terms of survival, culling decreased as days in the prepartum group increased until reaching a nadir at 20 days for both groups.

For most of the responses evaluated, a quadratic association with days in the prepartum group was observed. These data suggest that there is an optimal number of days cows should spend in the prepartum group that is somewhere between 21 and 28 days. Any greater, or fewer days in the prepartum group might have detrimental impacts on postpartum performance.

[Vieira-Neto et al., 2021. J. Dairy Sci. 104:5964-5978](#)



BEYOND BYPASS

Corn Plus RPL Can't Beat SBM and SoyPlus

New research shows that adding rumen protected lysine to lactating cows' diet can help regain some of the milk yield and milk protein lost when all dietary protein comes from corn. Protein sources, such as corn gluten meal and dried distillers grains with solubles (DDGS), contain less lysine than soybean meal.

Researchers at the University of Wisconsin compared lactating cows' performance when diets with similar protein content but different sources of supplemental protein were fed, including one with rumen protected lysine (RPL). The supplemental proteins evaluated include: all soy (10.6% soybean meal and 21.1% SoyPlus); half soy, half corn (5.3% soybean meal, 10.6% SoyPlus, 8.4% DDGS and 8.4% corn gluten meal); all corn (16.8% DDGS and 16.8% corn gluten meal); and all corn plus RPL (all corn diet plus 125 grams/day of RPL). The RPL was top-dressed immediately after the TMR was fed each morning. Cows were milked twice daily.

Results show that dry matter intake was highest for cows fed the all soy diet at 61.1 lbs/day. In comparison, cows fed the all corn diet and the corn plus RPL diet consumed about 2 lbs/day less feed. In terms of milk yield, cows fed the all corn diet produced the least amount of milk, 97.7 lbs/day, compared to an average of 101 lbs/day for the other 3 diets. Cows fed the all soy diet had the highest milk protein percentage, 3% yielding 3 lbs of milk protein per day. Milk protein percentage for cows fed the all corn diet was 2.9% compared to 2.97% for cows fed the half soy half corn diet and 2.94% for cows fed the all corn plus RPL diet.

Adding RPL to the all corn diet did recover some of the milk and protein lost from feeding an all corn diet. But it was still short of the production results seen when cows were fed the all soy diet using soybean meal and SoyPlus.

[Lobos et al., 2021. J. Dairy Sci. 104:6620-6632.](#)



PO Box 68 · 406 1st Street
Ralston, IA 51459



**PLEASE MAKE SURE TO SIGN
UP FOR THE E-NEWSLETTER**
Visit LandusCooperative.com today!

QUALITY CORNER

Consistency and Quality Drive Everything We Do

Soybean harvest is underway in Iowa! With each harvest comes a different bean crop, and this year's crop yields look good. But rest assured, your Landus Animal Nutrition team is on the job continuously analyzing current crop conditions and making adjustments accordingly, to ensure that the SoyPlus you rely on for results remains the same, load after load, rail car after rail car. Our team reviews the moisture content of beans, sourced locally from Iowa fields and hitting our production lines, in real time to ensure consistency in each and every shipment. Regardless of the composition of the incoming bean, the product leaving our facility will always provide top results for your operation.

