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DAIRY NUTRITION PLUS™

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USE MONITORING TO GET HER OFF TO A GOOD START

Cows that transition without clinical or subclinical disease, and that eat well, tend to produce more milk and stay in the herd longer. However, not all transitions are successful. Research shows that 35% of all dairy cows have at least one clinical disease event (metabolic or infectious), and approximately 60% have at least one subclinical disease event during the first 90 days in milk (LeBlanc et al., 2006; Ribeiro et al., 2013).

"The vast majority of the transition problems we face in commercial dairies are a consequence of poor dry-cow management, especially the ones happening within the first two weeks of lactation," says Luciano Caixeta, assistant professor, Veterinary Population Medicine Department at the University of Minnesota. "When we see more metritis, more displaced abomasums, more mastitis; it is a consequence of something that happened in the past." Looking back can help determine why, but improving transition cow success requires more than just looking back.

Establishing a monitoring program that is specific to your dairy can help identify the bottlenecks that exist and reduce disease incidence during the transition period, says Caixeta. Monitoring can be eyes on cows, technology such as rumination monitoring or a series of checklists; it can be whatever you are comfortable using. But you must use it. Collecting data without acting on it is a waste of time and money. Good monitoring programs enable you to be proactive instead of reactive.

MONITORING DEFINED

Monitoring programs should be practical, useful and tailored to the general goals of the dairy. A good monitoring program allows you to: 1. Detect unintended disruptions in performance under current management conditions; 2. Measure the impact of an implemented intervention or management change; 3. Motivate management or employee behavioral change on the dairy; 4. Make sure that performance matches expectations.

When selecting monitors look for ones that: 1. Have a minimum delay between cause and effect (lag); 2. Do not mask recent changes when using historical data (momentum); 3. Detect differences across the population (variation); 4. Do not contain misleading information or bias (Fetrow et al., 2006b) and have the sensitivity and specificity to detect and identify the problem. A robust monitoring program requires a combination of monitors.

New technologies, such as rumination monitoring, have been used quite effectively by some dairies. But the technology is expensive and not a good fit for every dairy. Having eyes on transition cows every day can identify cows that struggle. No matter what form of monitoring system you prefer, "carefully monitoring the transition dairy cow while considering all factors affecting health and performance enables prompt intervention to address rising problems and enhances cow health, well-being and productivity in a timely manner," says Caixeta.

AREAS TO MONITOR

Let's start with the dry cows. Follow best management practices backed by research. Control energy intake in far-off dry cows; minimize stress; avoid excessive weight change; provide clean and comfortable beds; use a DCAD diet to manage calcium homeostasis; and manage long-days dry closely. Low DCAD diets, when used to induce a mild metabolic acidosis, are very effective at reducing the incidence of clinical and subclinical hypocalcemia.

Avoid overcrowding in both dry and fresh-cows pens. Adhere to these guidelines for stocking density in 4-row barns: Far-off cows 100% (1 bed/cow); Close-up Holstein cows 80%; Close-up Jersey cows up to 100%; Fresh cows 80%. (In 6-row barns, stocking density will be less during these critical times as bunk space becomes the limiting factor.) Cows need access to fresh feed, clean water and clean and comfortable beds. Use heat abatement strategies and avoid prolonged standing times.

Caixeta recommends using the following monitors during the dry period.

- Check urine pH on a regular basis (weekly if possible). Goal average urine pH of 6.0 to 7.0.
- Keep track of pen counts to avoid overcrowding.
- Assess dry matter intake, feed delivery, particle length and consistency of the ration delivered.
- Monitor days dry.
- Provide cows with clean, comfortable, appropriately-sized beds.

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USE MONITORING TO GET HER OFF TO A GOOD START

Fresh-cow monitoring allows you to determine if cow performance matches expectations. This step is very useful to judge the return on investment of any additives or technologies used. If you try a new product to benefit transition cows, you must check if the expected benefit was received. If not, it may indicate an underlying management problem(s) is sabotaging cow performance, explains Caixeta. Recommended monitors for fresh cows include:

- Keep track of pen counts to avoid overcrowding.
- Assess DMI and consistency of feed delivery.
- Monitor days in the fresh pen.
- Make sure that cows have clean, comfortable and sanitary beds.
- Monitor and treat metabolic and infectious diseases.
- Record and investigate postpartum disease occurrence.
- Track changes in body condition score (goal ≤0.75 BCS).
- Keep lock-up times to under 45 minutes/day.

While some find monitoring peak milk helpful, this measure suffers from considerable lag time. Peak milk can help you identify which cows transitioned well and which did not. But it should not be used as a stand-alone trait to indicate problems. It is just one more indicator in your overall monitoring program. (For more details on recommended practices for transition cows, please see the chart below.)

The transition period is challenging for cows and producers. Good records, paying attention to cow comfort, proper nutrition and listening to your cows are tools to help maintain cow health and achieve expected production performance. Establishing routine and consistent systems to collect and analyze herd records is essential for healthy transitions. Work with your veterinarian and nutritionist to identify the monitors that are specific to the problem(s) that occur on your farm. Remember, too many monitors can lead to information overload and inaction.

Work together as a team, follow best management practices, use reliable data and act on that information. These steps can help minimize transition-cow problems and provide early and effective intervention for the problems that do occur.

RECOMMENDED PRACTICES AND GOALS

RECOMMENDATION	GOAL
Removal of old feed from bunk	Daily
Availability of feed	≥23 hours/day
Feed push up	Every 4 hours
Feed refusals	3 to 5%
Eating space	≥24 in/cow
Water availability	≥ 4 linear in/cow
Pre-partum DMI	
Primiparous	≥22 lbs/day
Multiparous	≥26 lbs/day
Post-partum DMI	
Primiparous	≥34 lbs/day
Multiparous	≥42 lbs/day
Social groupings	Separate parity groups
Cow comfort parameters	
Hock scoring	>80% cows w/hock lesions
Body condition score	
At dry off	2.75 to 3.5
At calving	2.75 to 3.5
At peak milk (~60 DIM)	2.5 to 3.25
Cow behavior	>60% cows lying, chewing cud 2 hours after feeding

FROM THE MATERNITY PEN

Comfy Cows Have Fewer Stillbirths

New research from the Ohio State University, presented at the ADSA conference last summer, shows that the lying time of pregnant cows before calving impacts the number of stillbirths. In the study, Extension Dairy Veterinarian Gustavo Schuenemann and collaborators evaluated 402 primiparous and 650 multiparous cows from three commercial dairies for lying time starting 14 days before expected due date until 14 days postpartum. Each cow was fitted with an electronic data logger on her hind leg to track lying time.

Multiparous cows that had a stillborn calf (born dead or died within 24 hours of birth with normal gestation length) had shorter lying times (716 minutes/day). In comparison, multiparous cows that had live calves had longer lying times (762 minutes/day)—more than 45 minutes/day difference. Primiparous cows that had a stillborn calf also had reduced lying time, just 570 minutes/day. Primiparous cows that had live calves averaged 625 minutes of lying time per day—nearly an hour more lying time was associated with successful delivery. For both multiparous and primiparous cows, longer average daily lying time was associated with more successful live births.

Researchers also collected blood samples seven days before expected due date and at calving to evaluate non-esterified fatty acids (NEFA) and calcium levels. Multiparous cows with stillbirths had elevated NEFAs and nearly twice the incidence of hypocalcemia (defined as ≤0.8 mg/dL) as multiparous cows that had live births. In primiparous cows, NEFA levels did not differ between cows with stillbirths or live births. But the incidence of hypocalcemia at calving was 15% in primiparous cows with stillborn calves and 9% in primiparous cows with live calves.

The results suggest that consistency of lying time is associated with prepartum energy and calcium status at calving of dams; and thus are critical for calf survival.

CONSULTANTS CORNER

Amino Acids Affect Reproduction, Too

PHIL CARDOSO
University of Illinois

Going from dry to freshening to pregnant again, all while staying healthy and reaching peak milk, requires cows to overcome an onslaught of challenges. Metabolic adaptations and endocrine changes must occur in symphony or cow health and performance suffer. Decreased dry matter intake, negative energy balance, infectious and metabolic disorders, and milk production that increases faster than energy intake in the first four to six weeks after calving are all roadblocks to healthy transitions and getting cows pregnant again.

While a lot of research has focused on dry-cow and close-up nutrition, there is still much to learn on what can be done nutritionally to help cows be ready to conceive and sustain a healthy pregnancy.

Most cows experience some level of negative energy balance during transition. And during times of negative energy balance, cows must make "metabolic decisions" about where to direct scarce resources. In early lactation those nutrients are directed to milk production instead of to the next pregnancy (Friggens, 2003). Research during the last two decades has revealed many links between nutrition and reproductive function in ruminants. Nutrition, or lack of nutrients, affects the ability of hormones, the immune system and the chemical signaling pathways to do their jobs during transition.

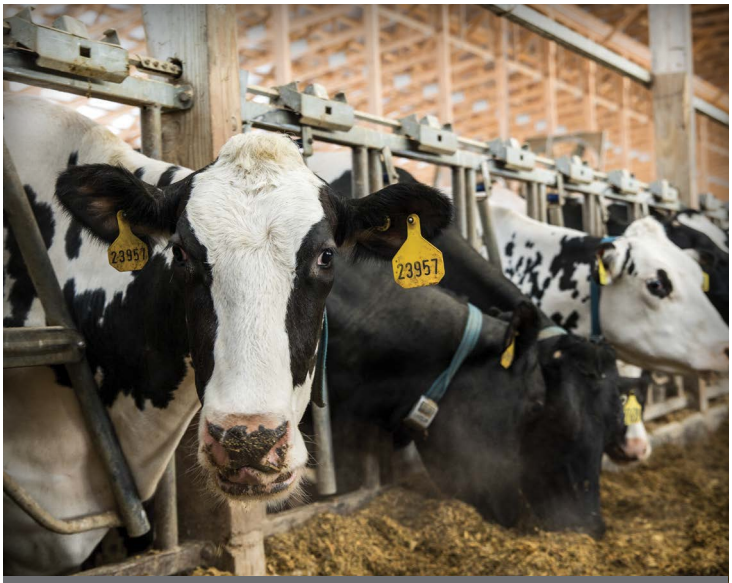
So the question becomes how can we provide cows with more nutrients that are available to use for reproduction? It's not just a matter of feeding more energy. Too much energy can trigger subacute ruminal acidosis. It's about finding the nutrients that can be used for reproductive functions.

Amino acids are the building blocks for all proteins. And so far methionine, lysine and histidine have been identified as the first three limiting amino acids for milk yield. But there is so much more to learn about amino acids in dairy cow nutrition. Perhaps amino acids will play a role in improved reproductive success.

In reproduction, from fertilization until days 25 to 28 when the embryo attaches to the uterine wall, the embryo is free-floating. During this time the embryo depends on uterine secretions for energy and amino acids. Recent research by Acosta et al., (2016) showed that the embryos from cows supplemented with rumen protected methionine (RPM) during the final stages of follicular and early embryo development (to day seven after breeding) had more lipid accumulation—more than twice the amount. This extra lipid accumulation could potentially be used to provide additional energy for the developing embryo.

In addition, research by Toldeo et al., (2015) found that cows supplemented with additional RPM had higher pregnancy rates following the same double ovsynch protocol and insemination practices. In multiparous cows fed supplemental RPM, pregnancy loss from day 28 to day 61 was just 6.1% compared to 19.6% pregnancy loss for control cows. There was no difference in pregnancy loss for primiparous cows during the same time period.

Methionine supplementation of cows seems to impact the preimplantation embryo in a way that enhances its capacity for survival. There is strong evidence that the extra lipid accumulation serves as energy for the developing embryo and reduces early pregnancy losses in multiparous cows. While there is still more to learn, this new area of research with amino acids may help improve reproductive performance of dairy cows.



BEYOND BYPASS

New Assay Could Improve Ration Accuracy

Ration formulation could soon take a big step forward. Researchers at Cornell University have developed a new assay named unavailable N (uN). The uN assay estimates the intestinal nitrogen indigestibility of non-forage feeds for ruminants and is a change from the acid detergent system currently used to determine bound, unavailable protein.

Diet formulation software, such as the Cornell Net Carbohydrate and Protein System (CNCPS), currently uses static or book values of intestinal digestibility of proteins and carbohydrates to predict the amount of metabolizable energy (ME) and metabolizable protein (MP) available. This often results in the MP and amino acid supply being over- or under-estimated, and animal performance not matching expectations.

The uN assay allows for the formulation of diets that are closer to cows' actual MP requirements and rumen ammonia balance. And when diets are formulated closer to cows' actual MP requirements, less crude protein is fed. That makes having the right amount of protein and amino acids in the diet crucial. The uN assay should improve accuracy between ration formulation and cow performance.

To investigate the accuracy and precision of the uN assay predictions, a study with 128 head of high-producing dairy cows was conducted. Two different blood meals (34% uN and 9% uN) were used to create a high uN (low digestibility) diet and a low uN (high digestibility) diet. Blood meal intake was approximately 2.3 lbs for each treatment, and dry matter intake (60 lbs) and N intake (667 grams) were similar for both treatments, but milk yield was significantly different. Cows on the high uN diet produced 4 lbs less milk per day than cows on the low uN diet.

Researchers concluded that the uN assay provides protein indigestibility predictions that are consistent with cattle responses and can be used to modify how CNCPS predicts protein digestibility, thereby improving the model's ability to identify the most limiting nutrient in cattle diets.

To learn more on this topic, please see "Development of an Assay to Predict Intestinal Nitrogen Indigestibility and Application of the Assay in High Producing Lactating Cattle: One Step Closer to Feeding a Cow like a Pig?"

http://www.dairynutritionplus.com/pdf-docs/VanAmburgh-Assay-uN.pdf

LANDUS COOPERATIVE

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

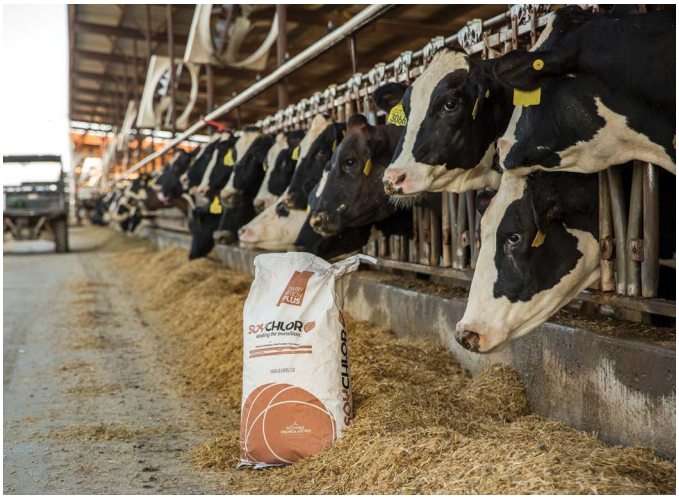
HAPPENINGS

Recent Webinar Shows Misinterpreted Research May Impact Dietary Calcium Recommendations

Last month the SoyChlor team hosted an exclusive webinar to explore a common question heard in the field: *What's driving the recent trend toward more extreme dietary calcium recommendations?*

The verdict? This recent trend pushing dietary calcium levels toward an extreme may be due to a misinterpretation of the research.

Many nutritionists and producers have been questioning the optimal amount of calcium in negative DCAD diets for prepartum dairy cows. Although research has not yet definitively determined the ideal value, several trials suggest that a moderate amount is enough. So where are the recommendations for extremely high calcium intakes coming from? It seems likely that research on metabolically alkalotic cows has heavily skewed the recommendations for feeding calcium to metabolically acidotic cows, but it's crucial to distinguish between metabolically acidified cows and metabolically alkalotic cows when reviewing the research.



Get answers to other questions about dietary calcium recommendations and access a recording of our latest webinar by visiting blog.dairynutritionplus.com for more information.