Ration basics: prepartum negative-DCAD recommendations

by Dr. Elliot Block, Senior Research Fellow and Director of Technology, Arm & Hammer Animal Nutrition

Evidence shows that feeding a ration with negative dietary cation-anion difference (DCAD) of -8 to -12meq/100g ration dry matter for the last three weeks prior to calving is an excellent strategy. That is because it can help prevent a rapid decline in blood calcium around calving and improve cow health and performance in the subsequent lactation. This approach helps reduce metabolic challenges like hypocalcaemia (clinical and subclinical). This is beneficial because cows with hypocalcaemia often experience a depressed immune response and are also susceptible to reduced skeletal and smooth muscle function. This predisposes cows to displaced abomasum, metritis, mastitis and other challenges.

Interestingly, when it comes to DCAD, lower is not necessarily better. Recent research conducted at the University of Florida has found that it is not necessary to reduce ration DCAD levels in prepartum diets beyond -12.

DATA DETAILS

The study shows that pushing DCAD levels beyond -12 did not show any positive effects on cow health and performance, meaning it only becomes an added expense. During the study, the researchers fed prefresh Holstein dairy cows a ration with a negative DCAD of either -7 meq/100g ration DM or -18 meq/100g ration DM for either the last 21 days or 42 days of gestation. They found that feeding a more negative DCAD diet – regardless of duration – adversely affected key metabolic and performance parameters of blood base excess and dry matter intake. Specifically, data showed that reducing the level of negative DCAD from -7 to -18 meq/100g ration DM:

- Reduced prepartum dry matter intake by 1.4-2.2kg per day.
- Induced a more exacerbated metabolic acidosis prepartum.

"The negative DCAD diet reduced dry matter intake prepartum as expected," explains Dr. José Santos, research foundation professor, University of Florida Department of Animal Sciences. "That is an anticipated response based on all the literature available."

Ultimately, the data suggest that there is no apparent reason why you should feed a negative DCAD diet more than -12meq/100g ration DM and DCAD of -8 to -10 appear to do the same job.

DOES TIMING MATTER?

These latest data reinforce previous research and indicates that dairies can feed negative-DCAD diets longer than 21 days without any negative effects. Again, no differences in energy corrected or fat corrected milk was observed in the cows fed the negative DCAD diet for the 42-day dry period.

In the long run, all cows benefited from the negative-DCAD diet, regardless of how long it was fed. The data offer compelling evidence that dairies that are unable to group cows separately or feed multiple rations during the dry period can still benefit from a negative-DCAD ration.

References are available upon request

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Target ration DCAD levels, not urine pH results

by Dr Ruby Wu
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There has been much attention paid lately to monitoring urine pH levels as a measure of transition cow health. In some instances, however, urine pH monitoring has become the focus of the nutrition management program rather than the desired outcomes related to health associated with rations adequately formulated for Dietary Cation-Anion Difference (DCAD).

Instead of debating how high or low urine pH levels should be, or what fluctuating urine pH levels mean, your program must aim beyond that. There is a larger concern: What are you really trying to accomplish when formulating rations for DCAD?

The number one purpose of feeding a negative DCAD diet prior to calving is to have healthier cows along with higher start-up milk and peak yields. When rations are properly formulated for negative DCAD more of the total blood calcium becomes available in ionised form, which reduces the risk of clinical and subclinical hypocalcaemia (SCH) and other metabolic diseases associated with transition cows and SCH, as well as improves start-up and peak milk. Reducing transition health challenges by lowering prepartum ration DCAD accomplishes this aim. Plus, this strategy helps elevate reproductive performance and cow productivity in the following lactation.

As for dealing with the minutiae of urine pH monitoring – it should be of lesser concern than the overarching objectives of improved animal health and performance. Still, it makes sense to develop and follow a specific protocol to obtain the most useful results. Once urine pH is less than 6.8, the job of acidifying cows is done!

TESTING PARAMETERS

When setting up a testing program, consider the following:

- Understand that there will be some fluctuations in urine pH due to the cow's biology. These variations are normal and no cause for alarm. Changes in urine pH can also be related to overcrowding, mixing and sorting challenges, feeding times or other management actions.
- Take samples at the same time to take some of the inconsistency out of your sampling program. If 80% of cows tested are not consistently within range, this should trigger further exploration beginning with overstocking, bunk management, mixing and sorting issues.
- Do not focus on getting and keeping urine pH levels to extremely low levels.

Breed	Targeted urine pH
Holstein	6.0 – 6.8
Jersey	5.8 – 6.5

FOCUS ON THE OUTCOME

There appears to be no justification for trying to achieve lower urine pH values based on postpartum health and production responses. Formulating rations with increasingly negative DCAD values only increases feed cost and can drive down feed intake. Dairies do not attain the performance payback they desire from this strategy; there are no compounding efficiencies or increases in health or milk production to be gained from further acidifying the blood. That noted, you may periodically record urine pH values below the target values during monitoring since some variation is normal based on the cow's biology and behaviour. But there is no reason to strive for consistently, extremely low urine pH values as a goal.

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What is in your farm's Microbial Terroir?

by Dr. Thomas Rehberger,
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If you are familiar with wine, you may have heard of terroir. It is what makes the wine of Napa Valley, California, unique from Sonoma County, California, and from one vineyard to the next. Terroir is loosely translated as a sense of place. It is the embodiment of the sum of the effects of a local environment on the characteristics of a product. Microbial Terroir is the unique microbiota that make up your farm's environment.

AGRICULTURE'S MICROBIAL TERROIR

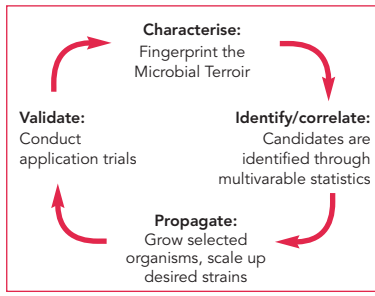
In the case of a dairy, its terroir would include housing facilities, feed, bedding, water, air and weather (temperature, humidity), as well as rodents or other transient visitors. It also includes micro-organisms (bacteria, yeast, moulds, viruses) found throughout the farm, meaning Microbial Terroir embraces virtually anything and everything that touches the farm and its animals. The various components that make up a farm's unique Microbial Terroir explain why the farm next door has different health challenges than yours, even though your systems may be remarkably similar.

APPLICATION ADVANTAGES

Producers are coming to understand that they can use the concept and technology of Microbial Terroir to uncover and better recognise the specific disease challenges on their farm, often stemming from strains of *E. coli, salmonella*, clostridia and others. For instance, 99.8% of all bovine manure samples analysed by our laboratory have tested positive for clostridia. In some cases, the farm was very aware of the problem, having struggled with haemorrhagic bowel syndrome (HBS) and other negative effects but did not know why or how to reduce the consequences. In other circumstances, the presence of clostridia was unknown, but the farm wrestled with digestive upsets and other subclinical health issues that lowered animal productivity.

APPLY THE UNSEEN

Using sampling protocols and advanced molecular biological techniques, we map out the complex Microbial Terroir that shapes – and enhances – the gastrointestinal (GI) tract of animals within your herd. We develop a customised solution from our database of proprietary *Bacillus* strains to effectively combat pathogens. The process is outlined below.



To accomplish this:
- Samples are gathered and analysed to assess bacterial challenges.
- Results are used to determine which strains of beneficial *Bacillus* strains will best address the harmful organisms found.
- Individualised solutions are developed and added to diets as a feed additive based on analysis results that address specific challenges.
- Continuous service and follow-up monitoring are implemented to facilitate long-term success.

Ultimately, these solutions help change the pathogen profile of a farm, lower harmful bacterial loads of animal GI tracts and enhance animal health and productivity.

To learn more, visit www.AHanimalnutrition.com

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