

# Taking more moderate approach to DCAD diet recommended

By TIM BROWN\*

**T**HE benefit of feeding a negative dietary cation-anion difference (DCAD) diet to closeup dry dairy cows is undisputed. However, recent industry-led trends toward more extreme acidification have opened up the debate about the best approach and have left producers questioning how to get the best results.

DCAD is not one size fits all. Different approaches work for different farms. Some farms strive to stay within the bounds of metabolic acidification established over years of research. Some farms opt for more extreme metabolic acidification. Both can find success.

However, for dairies seeking a simple, safe approach to DCAD, a moderate approach should be recognized as a well-researched option that means less risk, less management and healthy transitions.

Taking a moderate approach to DCAD means inducing a healthy state of mild, compensated acidosis. This is indicated by maintaining a group average of urine pH readings in the approximate range of 6.0-7.0. Within this range, herds will experience the majority of the benefits that come from DCAD, with minor management required.

To understand why moderate DCAD means easier management and less intense monitoring of urine pH levels, it's important to understand what happens when a negative-DCAD diet is fed and what those pH measurements are a reflection of.

When a negative-DCAD diet is fed, strong anions (chloride and sulfate from the diet) are making the blood more acidic. The kidneys protect the blood from this metabolic change that has been induced, and as the kidneys work quickly to remove acidity from the blood for excretion from the body, the urine becomes more acidic.

In order to stay within a healthy range

of mild, compensated acidosis, enough acidosis must be created to improve calcium flux (increased movement of calcium out of the bones and into the blood), but not so much that you risk interfering with other important metabolic functions.

The only suitable method for measuring this level on the farm is urine pH, but it is *only* an indirect reflection of acid-base status, and it is *only* useful over a narrow range.

Constable et al. (2009) shows that urine pH is only a good indicator of acid-base status when pH is between the levels of 6.3 and 7.4. These pH levels are consistent with moderate DCAD recommendations. Within this range, urine pH readings will give the most accurate reflection of what is actually happening in the blood. When you start pushing pH lower with a more negative approach, urine pH becomes a less reliable tool.

Now, with that moderate approach, urine pH readings will also be subject to much greater variability than with an extreme approach, but this is not a bad thing. Inconsistent pH readings do not mean that a moderate DCAD program is not working the way it should, just as consistent pH readings with an extreme approach are not a reflection of success.

Urine pH can be expected to vary in response to differences in anion consumption with a moderate approach. A whole host of factors will affect intake: body type and condition, heifers versus mature cows, stocking density, daily temperature fluctuation, etc. Those factors will be reflected in individual pH readings in a moderately acidified herd.

However, when cows are extremely acidified, urine pH will tell us *only* that she is extremely acidified, but it will not reflect any differences in anion consumption. That's because at this extreme level, the kidneys are removing acid from the blood as fast as they can, and urine pH, as a result, remains as low as it can go. The kidneys have resorted to auxiliary methods of removing acid from the blood, and urine pH is no longer a good reflection of the degree of metabolic aci-

dosis.

Moderate DCAD does work, and in fact, the decades of research done to support the practice of DCAD have been conducted with a moderate approach. The recent push to take the proven practice to the extreme is industry led and has not yet been thoroughly investigated by controlled university research.

So far, the limited research comparing extreme and moderate DCAD does not indicate additional benefits to health or productive variables when extra anions are fed.

Lopera et al. (2018) supports the notion that mild compensated acidosis via a moderate approach to DCAD is enough to reap the benefits. That study examined two levels of acidification: one with an average urine pH of 6.46, and the other with an average pH of 5.62. The level of acidification had no impact on 42-day milk yield, incidence of retained placenta, metritis, puerperal metritis, mastitis, displaced abomasum or incidence of milk fever. There were no health or production benefits derived from the more extremely negative-DCAD diet.

DCAD does not have to be hard, and a moderate approach may be the perfect introduction to the profitable practice for producers new to it.

## References

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