

TIPS FOR MANAGING NEGATIVE DCAD PROGRAMS

INTRODUCTION

Feeding pre-fresh cows a negative dietary cation anion difference (DCAD) diet has been shown to prevent periparturient hypocalcemia (low blood calcium), reduce the incidence of postpartum metabolic diseases (Charbonneau et al., 2006, Goff, 2008) and improve milk yield (DeGroot et al., 2010; Sweeney et al., 2015). Measuring urine pH of prepartum cows and serum calcium concentrations of fresh cows have been shown to be valid on-farm measures for evaluating the effectiveness of this nutritional strategy. When inconsistencies and deviations from expected values in these readings are experienced, dairy producers often question the value of using a negative DCAD program. The following tips may be helpful in fine-tuning a fully-acidified, negative DCAD diet for more consistent and successful program results.

RATION FORMULATION

Formulate a palatable diet to encourage dry matter intake. Mixtures of anionic salts and other DCAD products can be unpalatable.

1. The target ration DCAD level for a fully-acidified DCAD program is -10 to -15 mEq/100 grams of dry matter. Verify that urine pH falls between 5.5 and 6.0.
2. Recommended amounts of chloride and sulfur should range between 0.8 and 1.0% and 0.4 to 0.47%, respectively.
3. In order to optimize serum calcium status, dietary calcium should range between 1.52 and 1.6% on a dry matter basis (180 to 190 grams per day).
4. Provide sufficient dietary magnesium. Dietary magnesium concentration should range between 0.45 and 0.50% of the diet dry matter.
5. The sodium concentration should range between 0.1 and 0.2% of the diet dry matter. Diets inadequate or excessive in sodium may lead to udder edema.
6. Restrict dietary potassium concentrations. The lower the dietary potassium concentration of the diet, the lower the amount of anions needed to properly acidify the cow.
7. Feed a dietary phosphorus concentration between 0.36 and 0.42% of the diet dry matter.
8. Don't forget about minerals in drinking water. A recent water analysis is necessary to account for those mineral sources and to calculate an accurate DCAD.

URINE SAMPLING

Urine pH is a valuable tool for monitoring acidification of prepartum dairy cows.

1. Urine pH should be determined mid-stream using pH paper. Capturing a sample with a container is highly discouraged unless pH is measured immediately. Urine pH will drift higher the longer carbon dioxide is allowed to diffuse out of it.
2. If using a pH meter, calibrate the instrument before using. A standard solution for calibration with a pH of 5.0 or 6.0 will work. Measure urine pH immediately. Letting samples sit, even in sealed containers, before measuring pH gives erroneously higher urine pH values.
3. Urine pH values for fully-acidified cows range from 5.5 to 6.0.
4. Cows need to be on a negative DCAD diet for at least 2 to 3 days before accurate urine pH values can be obtained.

MANAGEMENT CONCERNS

A negative DCAD diet can only work if cows are consuming what is formulated.

1. Make sure cows have sufficient bunk and water space. All cows need to be able to come to the bunk at the same time. This can make the greatest improvement in fresh cow health and performance. Allow 30 inches per cow to optimize dry matter intake (Nordlund et al., 2006). This may result in open headlocks or stalls, as the goal is to encourage consistent and adequate dry matter intakes.
2. Avoid unnecessary pen movements in order to minimize social stress and maximize dry matter intake in the periparturient period (Nordlund, 2009).
3. Make sure dry cow diets are pushed up frequently. Cows can only eat what they can reach.

TMR TROUBLESHOOTING

1. Verify the ingredients of the on-farm TMR. Using the wrong feedstuffs or amounts, inaccurate scale calibration, or residual feed in the mixer can contribute to higher urine pHs.
2. Investigate if there have been any recent forage changes. This can affect DCAD balance, based on the mineral content of the forages included in the diet.
3. Chopping forages greater than an average length of 2 inches can promote sorting based on an uneven mix. Water can also be added if the dry matter of the diet is above 50% to minimize sorting and increase dry matter intakes. It may be necessary to verify that the diet formulation on paper matches what's going in the bunk. A wet chemistry analysis of a representative sample of the TMR with a DCAD calculation is encouraged.

Use these recommendations to make negative DCAD diets successful.

Animate® is an efficacious, highly-palatable DCAD supplement (Schell et al., 2015; Sweeney et al., 2015). Fully acidifying periparturient dairy cows has been shown to mitigate the incidence of clinical and subclinical hypocalcemia, decrease the incidence of associated metabolic diseases and increase start-up milk production.

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