

# THE MINERALS THAT MATTER: HOW TO ACHIEVE NEGATIVE DCAD DIETS.



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**To create a negative DCAD diet for your transition cows, you need to provide more anions (negatively charged ions) than cations (positively charged ions). Traditionally, anionic salts are fed to reduce dietary DCAD level but there is an alternative.**

Although there are several DCAD formulas suggested by the literature, the generally accepted formula is:

$$\text{DCAD} = (\text{Na}^+ + \text{K}^+) + (\text{Cl}^- + \text{S}^{2-})$$

This represents the sum of Sodium and Potassium as positive cations, plus Chloride and Sulphur as negative anions. When formulating DCAD diets, it is important to know these values for all the feeds you'll be using to calculate the overall dietary DCAD value, not just the DCAD value from the additional minerals.

Various sources of mineral salts, or more commonly referred to as anionic salts, can be fed to lower the DCAD in transition cow diets. These all vary in strength as can be seen in the table below. The level of DCAD for is measured in weight

**Table 1.** DCAD level of Anionic Salts.

Anionic Salt	meq/kg DM
Ammonium chloride	18,700
Ammonium sulphate	15,150
Calcium chloride	13,600
Calcium sulphate (gypsum)	11,600
Magnesium chloride	9,900
Magnesium sulphate	8,100

of milliequivalents (meq), which is a combination of molecular weight and strength of the electrical charge it possesses (Valence). Chemistry lesson over! It is common to report values for DCAD on either a meq per 100 grams of dry matter or per kg of dry matter (DM).

All of these anionic salts can be purchased and used on farm as a 'straight' mineral feed and mixed into a TMR, but this does leave room for error. Dr. Joel Pankowski, Assoc. Director of Technical Services for the Americas at Arm & Hammer, says: "Remember that the benefit of a carefully formulated, negative DCAD transition diet relies on cows consuming the specified diet. Inconsistencies can occur for a variety of reasons so limiting opportunities where diets could differ will help ensure the cow gets what was formulated."

Moving away from straight anionic salts can also provide other benefits in the form of additional nutrients. Instead, Dr. Pankowski recommends Bio-Chlor<sup>1</sup> to achieve both metabolizable protein and DCAD targets via a single feed: "When using straight mineral salts, we're also diluting the nutrient density of a diet. But with Bio-Chlor, we're adding valuable protein in combination with the necessary source of anions to achieve our desired DCAD level so it's multipurpose."

Choosing the strongest source of anions would achieve the desired negative DCAD level with the smallest quantity. But, anionic salts are also very unpalatable and could reduce dry matter intakes if not mixed or formulated correctly. But that's another article... ■



**Dr. Joel Pankowski** joined the Arm and Hammer Technical Services Team in 2011. Currently, he leads and manages a team of Ph.D. and DVM Multi-Species Technical Service Managers that provide technical expertise to the Field Sales Team, Key Influencers and Producers in the Americas.

Joel received both his BS and MS degrees from The Ohio State University and then went on to earn his Ph.D. in Dairy Management from Cornell University. His areas of expertise are: reproductive management and health, quantitative dairy herd data analysis, transition cow management and fatty acid nutrition.

His 30+ year career has included a variety of technical and leadership roles with the Monsanto Dairy Business, CPG Nutrients, AGWAY, Inc., Land 'O Lakes Purina Feed, and Alpha Animal Health. Joel resides in Baldwinsville, NY with his wife, Tracy and they have 3 grown children (Stacy, AJ and Trevor).

#### Reference:

<sup>1</sup> Bio-Chlor has a DCAD level of -4,020 meq/kg DM.

**NEXT IN THE SERIES:** We'll discuss the importance of maintaining dry matter intakes for transition cow diets.



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