

DCAD FAQs

Q: What is DCAD balancing?

A: Dietary cation-anion difference (DCAD) balancing is a complex concept that has simple, yet profound effects on herd performance and health. DCAD measures the levels of four macrominerals in the diet: positively charged cations, potassium and sodium, and negatively charged anions, chloride and sulfur. By adding these charges together the ration DCAD is determined. DCAD affects blood buffering capacity and acidity in a cow's blood.

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| Cations (sodium + potassium) | Anions (chloride + sulfur) | = | DCAD |
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Q: How do I know what DCAD level is best for my cows?

A: Ration DCAD levels will depend on the cow's stage of lactation.

For fresh and lactating cows, a positive DCAD level between +35 and +45 milliequivalents per 100 grams of dry matter is optimal to improve dry matter intake and milk and component production. Higher DCAD levels are especially effective during heat stress conditions, when cows naturally reduce feed intake and have further problems with low blood bicarbonate and rumen acidosis. Potassium is the main regulator of sweat glands, which means higher levels are needed during heat stress to maintain peak performance.

A negative DCAD is desirable for the three weeks prepartum. This increases blood calcium levels prior to freshening. Lowering DCAD to -8 to -12 meq per 100g ration dry matter helps increase blood calcium, which helps prevent milk fever, reduces udder edema and can lead to fewer retained placentas and displaced abomasums.

Q: Why do transition cows need a special diet?

A: A prefresh ration should be an intermediate step between a high-fiber, low-energy dry cow diet and a low-fiber, high-energy lactating diet. The diet should transition the rumen and prepare rumen microbes for the changing diet, while providing key nutrients to avoid metabolic disorders common at calving. This step is important to maintain cow health and enhance productivity in early lactation.

Diets must provide the cow with essential nutrients and rumen microbes necessary to produce bacterial protein efficiently. This creates an optimal rumen environment that enhances dry matter intake and feed efficiency, preparing prefresh cows for early lactation diets. BIO-CHLOR® Rumen Fermentation Enhancer is a palatable source of chlorides that creates a negative DCAD, research-proven to prevent costly metabolic disorders.

Q: Will balancing for DCAD in my transition ration really make a difference?

A: Metabolic disorders, especially milk fever, can dramatically reduce productivity and profitability in early lactation cows. This has a multiplier effect throughout lactation, with lower peak production and decreased total milk production throughout the lactation.

On-farm results on three large commercial dairies showed cows fed a negative DCAD ration three weeks prepartum:

- ◆ **Decreased incidence of metabolic disorders.** One herd saw incidence of retained placentas drop as much as 90.0%. Milk fevers also declined to less than 1%.
- ◆ **Increased early lactation milk production.** Milk fat rose from 3.96% to 4.31%, an increase of 0.35%. This totaled 0.44 lbs. more than the control group per cow per day.
- ◆ **Improved their economic impact.** Decreasing metabolic disorders and improving milk production both lead to a more positive financial margin for the dairy producers.

Q: Why should I be concerned about blood buffering and acidity (or pH of the blood)?

A: High-producing dairy cows tend to have a high level of acid buildup in their blood, due to high-energy diets and high metabolic production of acids as feed is transformed into milk. Under modern feeding practices, cows do not generate as much salivary bicarbonate—the major blood buffer—since rations are more focused on energy-rich feeds rather than forages that provide higher buffering levels. This, along with the high metabolic rate, results in depleted blood buffer levels so cows cannot neutralize all of the acids they produce.

Q: How can I raise DCAD levels?

A: To raise ration DCAD above levels forages can provide, feed DCAD Plus® Feed Grade Potassium Carbonate, a high-quality potassium source that doesn't include the counter-productive effects of sulfur or chloride.

During hot summer months, it is clear cows respond positively to a combination of sodium and potassium. Heat-stressed cows lose potassium through sweat and milk, often making them deficient in this thermo-regulating nutrient. Three studies at Texas A&M University showed that each 0.1 percentage increase in potassium led to almost one pound per day more milk.

Q: What's so special about potassium?

A: Potassium is present in milk in greater quantities than even calcium. Therefore, high-producing cows are often deficient in this critical nutrient. Potassium also appears to play an important role in insulin production, protein metabolism and in controlling the cows' "cell pumping." Because high-producing cows lose potassium through the normal everyday functions of milking and sweating, delivering adequate levels without adding chlorides or sulfates that can reduce ration DCAD is critical.

Research shows cows fed a positive DCAD ration through DCAD Plus supplementation:

- ◆ **Improved milk production.** Cows in the treatment group increased fat-corrected milk production by 8.58 lbs. per cow per day when compared to the control group.
- ◆ **Produced more fat.** Milk fat rose from 3.96% to 4.31%, an increase of 0.35%. This totaled 0.44 lbs. more than the control group per cow per day.

Q: Does feeding buffers help increase DCAD?

A: Ration DCAD levels will depend on the cow's stage of lactation.

If the buffer being fed is sodium bicarbonate, or sodium sesquicarbonate, it does help increase the DCAD level. You can determine the amount of impact the buffer will have on DCAD by checking the minimum sodium guarantee, as not all buffers carry the same guarantee.

In addition, it is vital that overall nutrient requirements provide the proper balance of both potassium and sodium. It is also important to supplement magnesium in rations when feeding extra potassium, and, subsequently, to monitor potassium fertilization levels on farms.

Q: Where can I learn more about balancing DCAD levels?

A: To determine DCAD levels in your herd, forage testing is critical. By testing forages for macrominerals you can easily calculate your ration DCAD. Contact your nutritionist or ARM & HAMMER® representative for help as you balance ration DCAD levels.

