

# HOW DOES A NEGATIVE DCAD DIET WORK TO PREVENT MILK FEVER?



By Dr. Elliot Block, PhD, PAS, Diplomate ACAS  
Research Fellow

## Feeding a negative DCAD diet is a strategic nutritional strategy to prevent milk fever. The key to its success is all down to altering the cow's blood pH.

Simply put, a negative DCAD diet is achieved by feeding more anions than cations in the diet. If more anions than cations enter the blood from the digestive tract, blood pH will decrease due to less blood buffers available.

With the reduction in blood pH, the bones become more responsive to parathyroid hormone (PTH) and can quickly mobilise bone calcium stores when they need to. When this mechanism is already 'switched on' at calving, there is no lag between the sudden increase in calcium requirements and what is available in the blood.



The level of calcium in cow's blood is typically around 10 grams, but a cow will lose 23 grams producing 10 litres of colostrum, creating a shortfall of 13 grams. The bones have a soluble pool of calcium surrounding them, which can typically provide between 6 and 10 grams of calcium. However, **thanks to the unique action of PTH and reduced blood pH, the amount of calcium available here increases by 6 to 8 grams.**

Dr. Elliot Block, Research Fellow with Arm & Hammer, and a well-respected researcher in the field of negative DCAD diets, says: "We know how to prevent clinical and sub-clinical milk fevers and we've known it for decades. Negative DCAD diets remain the safest way to achieve transition cow health and performance."

Some of Dr. Block's early research pioneered negative DCAD diets for preventing milk fever. Leclerc and Block (1989)<sup>1</sup> showed a strong relationship between lower dietary DCAD and a more positive concentration of blood calcium, which was strongest from 12 hours before to 12 hours after calving.

Dr. Block concludes that "Negative DCAD is not a new approach but we have refined our understanding over the last 40 years. However, **no nutritional intervention can overcome poor management and that remains a large focus for navigating a successful transition period.**" ■



**Dr. Elliot Block** joined Arm & Hammer Animal Nutrition as Field Technical Services Manager in 1999 and changed roles to Research Fellow (R&D) in 2019 where he has been leading the Research and New Product efforts. Elliot received his B.S. degree from Cornell University and his M.S. and Ph.D. degrees from The Pennsylvania State University. His areas of expertise are: Animal Nutrition and Physiology with research topics ranging from nutrient partitioning, development of DCAD concepts and application, Pro- and Pre-biotic applications in health.

His 45 year career started as Professor of Animal Nutrition at McGill University in Montreal, Canada where he was also part-time member of the Faculty of Medicine as Director of the McGill Nutrition and Food Science Centre. Elliot then came to Arm & Hammer at the end of 1999.

### Reference:

<sup>1</sup> Leclerc H, Block E. 1989. Effect of reducing dietary cation-anion balance for prepartum cows with specific reference to hypocalcaemic parturient paresis. *Can J Anim Sci* 1989;69:411.

**NEXT IN THE SERIES:** We'll discuss the most suitable feeds for achieving negative DCAD diets.



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