Research Summaries II

"Dairy"

Moderator—Robert van Saun

Effects of Calcium Level on Hypocalcaemia and Associated Conditions in Dairy Cattle Fed Acidic Diets in the Late Dry Period

Phillip W. Jardon, *DVM, MS, MPVM*
Leon Weaver, *VMD*
Chuck Holmberg, *DVM, PhD*
Veterinary Medicine and Teaching and Research Center (VMTRC)
University of California, Davis (UCD)
Howard Hellman, *MS*
Practicing Animal Nutritionist
Hellman's Nutrition, Upland CA

Abstract

Recent research and field reports have shown a decreased incidence of milk fever and subclinical hypocalcemia when dairy cows are fed anionic salts. Researchers suggest feeding high levels of calcium when balancing for DCAD. Some producers have resisted adding more calcium to prepartum rations because of the fear it will cause more milk fever. The objective of this study was to determine if additional calcium supplementation is beneficial when feeding acidic rations prepartum. Two rations were compared with the same level of anionic salts, but different levels of calcium. From this study we are able to make some suggestions on calcium level and other aspects of using anionic salts to prevent milk fever.

Recent research and field reports have shown a decreased incidence of milk fever and subclinical hypocalcemia when dairy cows are fed acidic (anionic) rations. The acidity of a ration is measured by calculating the dietary cation-anion difference (DCAD), DCAD = (Na + K) - (Cl + S) meq/kg. Researchers suggest feeding high levels of calcium when balancing for DCAD. Some producers have resisted adding more calcium to prepartum rations because of the fear it will cause more milk fever. The objective of this study was to determine if additional calcium supplementation is beneficial when feeding acidic rations prepartum. One group received 150 grams calcium/head/day, and another group received 65 grams calcium/head/day. The rations were formulated to be equivalent in all nutrients except calcium, with a DCAD of -150 meq/kg.

For cows in lactation ≤ 3, the high calcium group (n = 110) showed a small trend (7% vs 11%) toward reduced milk fever compared to the low calcium group (n = 96). Retained placentas were higher in the high calcium group (23% vs 13%); however, since the end of the trial we have observed low retained placenta rates with high calcium diets. There was no difference in serum calcium, magnesium, or phosphorus concentrations on the three days before calving or the day after calving. The calcium magnesium and phosphorus levels the day after calving were 7.5, 2.7, and 5.8 mg/dl respectively. The dry matter intake was the same for the two groups (29.5 lbs). There was no difference in milk production or reproductive parameters.

Based on the results of this study, our clinical experience, and review of the literature we make the following recommendations for anionic salt usage: Calcium level should be high (greater than 150-180 grams). Phosphorus level should be relatively low (30-40 grams, definitely below 60 grams). This results in high Ca:P rations, but they are appropriate for close-up dry cows. Cows can consume up to 5 equivalents of anionic salts if a TMR is fed and fermented feeds are included, but an effort should be made to decrease the need for high levels of supplementation by using forages testing low in potassium and sodium. This will help maximize dry matter intake and decrease the cost of the mineral package. When using anionic salts dairy producers do not need to be afraid of high calcium feeds (like alfalfa) unless they test high in sodium or potassium. This allows for more flexibility in designing close-up dry cow diets. Urine pH can be used to monitor anionic salt diets. Rations properly balanced with anionic salts should be acidic (pH <7).