

Use of Hydrochloric Acid as a Source of Anions for Prevention of Milk Fever

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Diets that contain high amounts of K induce milk fever by alkalinizing the blood of the cow, reducing the ability of homeostatic mechanisms to maintain normal blood concentrations of Ca. The addition of anions to the diet induces metabolic acidosis, which counteracts the alkalinizing effect of the high cation diets commonly fed to cows. Currently, anions are usually added as anionic salts, such as CaCl₂ or MgSO₄, and the pH of urine is often monitored to assess the degree of metabolic acidification resulting from the addition of anions to the diet. An alternative source of anions is HCl. In Experiment 1, the addition of HCl to the diet of cows that were not pregnant and not lactating significantly reduced the pH of urine and blood within 24 h. After HCl was removed from the diet, the pH of urine returned to baseline levels within 48 h. In Experiment 2, the inclusion of HCl into the prepartum ration of Jersey cows entering the third or greater lactation significantly reduced the incidence of milk fever from 63% of control cows to 11% of the treated cows and also reduced the degree of hypocalcemia that was experienced by the cows during the periparturient period. Plasma Ca concentrations at 0.5 d after calving were 5.33 ± 0.52 and 6.69 ± 0.51 mg/dl in the control and the HCl-treated cows, respectively. In Experiment 2, the prepartum consumption of the ration with HCl was greater than the consumption of the control ration. In liquid form, HCl remains dangerous to handle and corrosive to machinery. Commercial preparations of HCl mixed into common feed ingredients as a premix could offer an inexpensive and palatable alternative to anionic salts as a means of controlling the incidence of milk fever in dairy cows.

Key Words: milk fever • hypocalcemia • hydrochloric acid

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