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Influence of 25-hydroxyvitamin D3 and Calcium Chloride Bolus on Serum Calcium, Phosphorus and Magnesium Status of Multiparous Holstein Dairy Cow

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Abstract

Hypocalcemia is a metabolic disorder in cows that is associated with the incidence of several diseases in early lactation. The aim of this study was to determine the effectiveness of 25-hydroxyvitamin D3 supplementation before calving and postpartum calcium chloride bolus compared with bolus calcium chloride alone in cows receiving acidogenic diet in late pregnancy. Two hundred and forty multiparous Holstein dairy cows were assigned to one of three groups of 80 cows. Group 1 received daily 3 mg of 25-hydroxyvitamin D3 capsule starting a maximum of 5 days before the anticipated parturition date and administered 50 g Ca as a CaCl2 bolus at calving and 12 h later. Group 2 received 50 g Ca as a CaCl2 bolus at calving and 12 h later. Group 3 was fed the acidogenic diet. Serum concentrations of Ca, P and Mg were measured by conventional methods and 25-hydroxyvitamin D3 levels by HPLC. The results showed that serum 25-hydroxyvitamin D3 in the first group significantly increased after the vitamin D3 capsule administration. Pre-partum calcium level in group I was significantly higher than group II and group III and the postpartum level was higher in group I and group II than group III. Phosphorus values were significant at different times but were not affected by the interaction between group and time. Serum magnesium changes showed significant effect at different times but were not affected by different groups. This study showed that the administration of 3 mg of vitamin D supplementation for up to 5 days before parturition is effective in improved calcium homeostasis.

Key words: 25-hydroxyvitamin D3, Calcium Chloride, Hypocalcemia. Dairy Cow

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