EFFECTS OF SUPPLEMENTATION OF DIETARY ANTIOXIDANTS AND CHELATED TRACE MINERALS IN PERIPARTURIENT DAIRY COWS AND SUBSEQUENT RESPONSE TO INTRAMAMMARY BACTERIAL CHALLENGE

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ABSTRACT

Experiments were conducted to investigate the effects of supplementation of synthetic dietary antioxidants and chelated trace minerals in periparturient dairy cows and subsequent response to intramammary bacterial challenge. During the peripartum period, supplementation over National Research Council requirements may not be beneficial to multiparous cows, although signs of antioxidant status and health improvement were seen when primiparous cows were supplemented. Treatments did not affect dry matter intake. Milk yield was not different over time between treatments in primiparous cows; however, the control group showed slightly increased milk production in multiparous cows. Multiparous cows subjected to the combination of dietary antioxidants and organic trace minerals had increased rabies antibody titers in response to vaccination, suggesting an enhanced adaptive immune response. During an experimental Escherichia coli mastitis, supplementation may not be beneficial to primiparous cows, although production variables were improved when multiparous cows were supplemented with inorganic trace minerals. Dry matter intake and milk production were inversely related to somatic cells score. Milk quality was altered in the infected quarter and to a lesser extent, in control quarters. Feed efficiency declined after bacterial infusion. In conclusion, response of primiparous and multiparous animals varies among parities under different situations of stress.