

Posters

Effect of dietary selenium sources on selenium and glutathione peroxidase concentrations and immune function in beef cattle

Noureddine Jinane, MSc -veterinary sciences¹; **Younes Chorfi**, PhD, assistant professor¹;

Yvon Couture, Visiting professor¹; **Alain Fournier**, Agronomist²

¹Faculty of Veterinary Medicine, Montreal University, Saint-Hyacinthe, Quebec, Canada, J2S 7C6

²Agriculture, Fisheries and Food of Quebec (MAPAQ), Québec, Canada, G1K 7Y7

Introduction

In dairy cows, several studies have mentioned that selenium (Se) improves immune function mainly through antioxidant enzymes that likely protect immune cells from oxygen-derived radicals. However, in beef cattle few studies have been conducted to evaluate the effect of Se on the immune system. The aims of this study were to determine the effects of source (organic or inorganic) Se supplementation on Se and glutathione peroxidase (GSH-Px) concentrations in beef cows and their calves and on immune variables of the calves.

Materials and Methods

Two groups of cows were given 3 mg of either organic or inorganic Se in a mineral supplement daily starting 12 weeks before calving and continued until weaning. The third group of cows received no supplemental Se in the diet and their calves were divided into two subgroups; one group of calves received an injection of sodium selenite (0.087 mg/kg) after birth, and the other did not. Serum Se and whole blood GSH-Px, respectively, were measured by HPLC-UV and a kinetic-enzymatic technique. Immune variables of calves were evaluated with commercial kits for phagocytosis, respiratory burst, and CD4:CD8 ratio and radial immunodiffusion for total IgG concentrations.

Results

In cows and calves, Se supplementation significantly ($P < 0.02$) increased serum and colostrum Se concentrations, and the organic Se supplement increased Se concentration to a greater extent than the inorganic Se supplement. However, Se concentrations in milk were significantly ($P \leq 0.0007$) increased only for the cows that received the organic Se. Selenium supplementation increased GSH-Px concentrations in cows ($P \leq 0.04$) and their calves ($P \leq 0.0004$); calves that received organic Se had a higher ($P \leq 0.0004$) GSH-Px concentration than did calves that received the inorganic Se. Calves that received the Se injection had a transient increase ($P < 0.0001$) in serum Se concentration. The immune variables evaluated in calves did not differ significantly ($P > 0.01$; not significant after Bonferroni adjustment) throughout the study.

Significance

Our results indicated that Se supplementation improved Se concentration in colostrum, milk and serum and blood GSH-Px concentrations in cows and their calves, but did not have any significant effect on the evaluated immune variables in calves.