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The Effects of Nano Selenium on Performance and Immune System of Suckling Holstein Dairy Calves

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Abstract

The aim of this research was to consider the effects of Nano Se (NS) supplemented on colostrum and milk during first 30 days of life based on the performance and skeletal growth and also it effects on hematological parameters, blood Se concentration, total antioxidant status (TAS), glutathione peroxidase activity (GPX) and serum immunoglobulin G (IgG) in suckling Holstein calves. Therefore, twenty four newborn calves were randomly assigned with the following treatments C= control (no supplementation and selenium derived only from milk and concentrate); NS 0.2=0.2 mg of Nano Se/animal per day to the colostrum at first day and then to milk; and NS 0.3=0.3 mg of Se/animal per day to the colostrum at first day and then to milk. The blood concentration of Se was higher in the NS 0.2 and NS 0.3 treated animals than in the control animals ($P = 0.05$) at 30 days of age. TAS was higher in NS 0.3 treated animals compare to NS 0.2 and control animals at 30 day of trial ($P = 0.05$). GPX activity during the 30 days of the 30 days of the research was higher in animals receiving NS supplementation compared to the control animals during the 30 days of the experiment ($P = 0.05$). And also serum IgG was higher in the NS 0.2 and NS 0.3 treated animals Compared to the the control animals ($P = 0.05$) at 0 and 3 days of age. No difference was observed in the DMI, WG, WH, HG and BL among treatments regimes when the calves were 0, 15 and 30 days old. Feed conversion (FCR) was more efficient in NS treated animals than in control animals during the 30 days of age. There were no significant differences in platelet cells, hemoglobin, red blood cells, white blood cells, packed cell volume, neutrophils and lymphocytes among treatment regimens at 0, 15 and 30 days of age. Selenium supplementation also did not act as a growth promoter but did improve TAS status, GPX activity, serum IgG and blood Se concentration in treated animals with NS during this phase of compromised health.

Keywords: Ghlutathione peroxidase activity, immune system, performance, total antioxidant status

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