

2nd International Conference on **Animal & Dairy Sciences**

September 15-17, 2014 Hyderabad International Convention Centre, India

Effect of replacing inorganic zinc with a lower level of organic zinc (zinc propionate) on performance, biochemical constituents and mineral status in buffalo calves

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Zinc is a component of more than 300 metallenzymes and thus an important trace mineral for livestock affecting all phases of production. It is also one of the most deficient mineral in soil, feeds, fodders and animals in many geographical regions of India and World. The trace minerals in majority are supplemented in animal diets as inorganic forms (sulphates or oxide salts), which suffer from high rates of loss due to dietary antagonism resulting in low production and thus these mineral salts are supplied in excess to meet their requirement. However, an excess of supplemental inorganic minerals leads to waste and environmental pollution. Organic source of trace minerals have higher bioavailability and thus could be supplemented at lower levels, reduce excretion and environmental pollution. Thus the present study of 150 days duration was carried out to investigate the effects of replacing inorganic (ZnSO_4) with at lower level of organic zinc (Zn propionate) on growth performance, biochemical constituents and mineral status in buffalo calves. Twelve buffalo calves with an average body weight of 193.3 ± 19.63 kg (14-24 months), were randomly allotted to a control (80ppm Zn from ZnSO_4) and experimental (60ppm Zn from Zn-propionate) diet. The calves grew with an average daily gain of 514.6 and 541.7 g, with dry matter intake of 4.96 and 5.12 kg/d, respectively on inorganic and organic zinc and were comparable. The fortnightly body weights, dry matter and nutrient intake, efficiency of nutrient utilization, mineral (Zn, Cu, Mn, Fe) concentration in serum of calves fed Zn-propionate (60ppm) was comparable to those on ZnSO_4 (80ppm). The serum total protein and globulin concentration improved with organic Zn supplementation. Supplementation of Zn-propionate significantly ($P < 0.05$) increased alkaline phosphatase activity and superoxide dismutase activity by 23%, compared to ZnSO_4 , both being markers of Zn status in animals, indicating higher bioavailability of Zn from Zn propionate. Serum total protein ($P < 0.01$) and globulin ($P > 0.05$) concentration improved with organic Zn supplementation. The study indicated that organic Zn could be included at lower levels i.e., at 75% of inorganic mineral supplementation in buffalo calves.

Biography

D Nagalakshmi has completed her Masters and PhD in Animal Nutrition from Indian Veterinary Research Institutue, Bareilly, India. She is having 15 years of teaching and research experience and presently working as Professor and Head, Department of Animal Nutrition in College of Veterinary Science, Korutla in Andhra Pradesh. She has received many National and State Awards for her contributions in field of Animal Nutrition. She has published more than 80 papers in reputed Journals and is referee for many reputed Journals.

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