

STUDIES ON THE EFFECT OF DIETARY SODIUM FLUORIDE ON SERUM MINERALS AND ALKALINE PHOSPHATASE ACTIVITY IN BUFFALO CALVES

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ABSTRACT

An experiment was carried out to evaluate the effect of high dietary fluoride intake on serum minerals and alkaline phosphatase activity (ALP) in male murrah buffalo calves of 6-8 months age. Eight calves (4 in each group) were selected from the Murrah herd according to their body weight. A normal farm ration was fed in control group while in another group sodium fluoride was added to the ration so as to make ration containing 60 ppm fluoride on dry matter basis. The animals were fed for a period of 3 months and a metabolic trial was conducted at the end of study. The study revealed that dietary fluoride caused significant decline ($P < 0.05$) in serum Ca and Zn on day 90 but serum ALP activity increased significantly ($P < 0.05$). However, serum Fe and Cu remained unaffected. The data suggest that 60 ppm fluoride has an adverse effect on serum minerals and ALP activity in buffalo calves.

Key words: Alkaline phosphatase activity, fluoride, minerals, buffalo

Domestic animals are prone to fluorosis due to the ingestion of high fluoride containing water, pasture, grass, mineral supplements and fodder grown near industrial polluted areas (Wheeler and Fell, 1983). Several researchers have reported osteodental fluorosis in buffaloes and cattle (Shupe, 1980, Choubisa, 1999). In addition to pathological changes in bone and teeth, high fluoride level also interfere the biochemical constituents in serum, some of which may be of diagnostic significance. Fluorosis also interferes with metabolism of Ca and P in the body (Underwood, 1977). Fluorine is a cumulative poison and reports (Krook and Maylin, 1979, Crissman *et al.*, 1980) indicate that even the recommendation of safe level of dietary fluoride does not protect the animal against severe chronic fluoride poisoning. Adequate information is available on clinical aspects of fluorosis. However, information is scarce regarding the subclinical changes at higher levels of fluoride fed for a short period resulting in absence of clinical manifestation in buffaloes. The present communication describes the influence of high

fluoride intake on serum minerals and ALP activity in buffalo calves.

MATERIALS AND METHODS

Eight, male Murrah buffalo calves of about 6-8 months age were randomly divided into two groups of 4 each on the basis of their body weight (92-115Kg). Both the groups were fed a normal farm ration consisting of concentrate mixture and roughage (chopped green jowar and wheat bhusa in 1:1 ratio) to meet their nutrient requirements as per ICAR (1985) recommendations. Clean tap water was provided *ad libitum*. All the animals were examined regularly for their health throughout the experimental period.

Concentrate mixture (CM) in both the groups was common and comprised of maize (25 parts), barley (10 parts), deoiled mustard cake (15 parts), wheat bran (15 parts), mineral mixture (2 parts) and common salt (1 part) having 20% crude protein and 70% total digestible nutrients. NaF (chemical grade) was added in the concentrate mixture of group II, in required quantity (132.60 mg) so as to make F concentration of 60 ppm on

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