

STUDY OF CALCIUM METABOLISM IN CAPTIVE ELEPHANTS BY MEANS OF FEEDING TRIAL

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Abstract

Hypocalcemia in elephants is a concern that needs attention. Cases of calcium-responsive dystocia have been reported anecdotally and the number of bone fractures in hospitalized working elephants in Thailand is relatively high.^{2,3} A feeding trial in 4 Asian elephants at the Rotterdam zoo showed that an increase in the calcium concentration of the roughage resulted in a significant rise in blood calcium levels.^{1,4} The results of a follow-up study in 5 European zoos, including 12 Asian elephants and 6 African elephants are discussed in this presentation. Blood calcium levels taken during periods in the summer in which normal food was replaced by a calcium-rich diet and a vitamin D-rich diet were compared. The study was repeated in the winter in order to determine the influence of UV light on blood calcium levels. The following parameters were measured in heparinized plasma and/or whole blood: ionized calcium, total calcium, phosphate, 1.25(OH)₂vitD, and 0.25(OH)vitD. In addition, the plasma levels of markers for bone formation (bone alkaline phosphatase--BAP), and for bone resorption (N-terminal of telopeptide of collagen I--NTx), were measured to find out whether the induced changes in ionized calcium, total calcium and phosphate could be related to an increase/decrease of mineral exchange between blood and bones.

Results indicate that Asian elephants depend more on dietary calcium concentration than African elephants. The latter species, however, seems to profit more from vitamin D supplementation in the food.

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