

HOOF MINERALOGICAL ANALYSIS: A TECHNIQUE FOR EVALUATING VITAMIN AND MINERAL STATUS OF RETICULATED GIRAFFE (*GIRAFFA CAMELOPARDALIS RETICULATA*)

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Abstract

Cheyenne Mountain Zoo (CMZ) is home to the largest herd of reticulated giraffe at any zoo accredited by the Association of Zoos and Aquariums, and it is a proud leader in giraffe care and reproductive success within that community. From 2013 to 2018, an increasing number of giraffe in the herd displayed potential signs of mineral deficiencies, specifically in calcium. In response, CMZ made a significant diet change in April 2018 from a regionally-milled product, Hubbard Feeds High Fiber Herbivore pellet, to Mazuri[®] Wild Herbivore Hi-Fiber Diet. Evaluation of ungulate nutritional status through hair samples, as well as qualitative evaluation of hoof growth as an indicator of mineral status, has been used for free-ranging animals (Flynn *et al.*, 1997). A study on morphological, chemical-physical, and mineralogical characteristics of horse hooves (Sargentini *et al.*, 2015) validated mineral analysis of hoof trimmings. The present study seeks to validate this technique in giraffe and use it to track animal nutritional status after the 2018 diet change. CMZ collected and analyzed hoof trimmings and blood samples from three giraffes, via positive reinforcement training, over a period of one year. Both hooves and serum were analyzed for concentration of minerals (Ca, P, Mg, K, Na, Fe, Zn, Cu, Mn, Mo, S, Co, Cl, Se) and vitamins (A and E), to verify whether hoof analyses reliably reflect serum analyses. A comparison to animals consuming a similar diet long-term was also conducted by collecting hoof and blood samples from two institutions (Dickerson Park Zoo and Columbus Zoo) that have been feeding Mazuri[®] Wild Herbivore Hi-Fiber Diet for > 2 years. Analysis of hoof trimmings may serve as a valuable non-invasive tool for the assessment of nutritional status of giraffe under human care.

Literature Cited

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