

# ANALYSIS OF FECAL GLUCOCORTICOID CONCENTRATION IN AFRICAN (*LOXODONTA AFRICANA*) AND ASIAN (*ELEPHAS MAXIMUS*) ELEPHANTS IN RELATION TO MANAGEMENT AND NUTRITIONAL FACTORS

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## **Abstract**

Identifying relationships between management and nutrition factors related to the physiological needs of elephants under human care is vital for improving husbandry and welfare standards. This study consisted of 130 African (*Loxodonta africana*) and 104 Asian (*Elephas maximus*) elephants housed in 65 separate facilities throughout North America. Fecal samples were obtained every other week for 12 months and analyzed for fecal glucocorticoid metabolite (FGM) concentrations by EIA. All management and housing data were collected by electronic survey methods. Repeated measures analyses were run to identify relationships between FGM and sex, environment (climate zone and season) and management (enrichment, animal contact, feed total, spatial experience, herd size, and other social group factors) factors. Analysis showed that African elephants had higher FGM concentrations at facilities where animals were fed more frequently ( $P < 0.05$ ). In addition, as the number of different social groupings an African elephant experienced at their facility increased, there was a positive correlation to FGM concentrations ( $P < 0.05$ ). However, as the number of elephants an individual had contact with during the day increased, significant decreases in average FGM level were exhibited by those individuals amongst the African population. In contrast, these same relationships were not duplicated for the captive Asian elephant population. Therefore, further investigation into differences in diet management and associated social interactions amongst the facilities may need to be conducted. These results may impact the future of husbandry and management practices related to captive elephant overall health and welfare.