DIETARY MANAGEMENT OF DIABETES IN A WHITE-CHEEKED GIBBON (*NOMASCUS LEUCOGENYS*) AND MANDRILL (*MANDRILLUS SPHINX*)

Adam Reppert, MS, RD, CDCES

Nutritional Services Department, Fort Worth Zoo, 1989 Colonial Parkway, Fort Worth, TX 76110, USA.

Abstract

Diabetes is a chronic disease that affects various species of animals, with pathogenesis often influenced by modifiable factors (*e.g.* obesity, excessive or inappropriate diet) and non-modifiable factors (*e.g.* age, genetics). Treatment of diabetes thus typically includes dietary management to reduce or regulate energy and macronutrient (carbohydrate, fat) content. Based on similar pathophysiology of diabetes in non-human primates as in humans, similar nutritional interventions may be employed for captive non-human primates with diabetes, with modifications based on species-specific and individualized considerations. Dietary modification using human diabetes recommendations (MacLeod *et al*., 2017; ElSayed *et al*., 2023), including overall reduction of total carbohydrates to 45-65% of diet by energy, replacement of carbohydrates with more protein and fat, and reduction in meal size with increase in feeding frequency, was successfully employed for management of diabetes in a male white-cheeked gibbon (*Nomascus leucogenys*) and female mandrill (*Mandrillus sphinx*) at the Fort Worth Zoo. These changes were made with consideration of training needs and competing management goals of weight gain or maintenance in both animals and of chronic colitis in the gibbon, as well as individual food preferences. Monitoring and evaluation of changes included weight changes, urine glucose and ketones, and, in the gibbon, serum glucose and fructosamine. While urine markers were not sensitive enough to detect changes in glycemic status, serum fructosamine values in the gibbon revealed acceptable stability (lack of progression) of glycemic status without the need for addition of medication.

Literature Cited

MacLeod J, Franz, MJ, Handu D, Gradwell E, Brown C, Evert A, Reppert A, and Robinson M (2017) Academy of Nutrition and Dietetics nutrition practice guideline for Type 1 and Type 2 diabetes in adults: nutrition intervention evidence reviews and recommendations. *J Acad Nutr Diet* 117(10):1637-1658.

ElSayed NA, Aleppo G, Aroda VR, Bannuru RR, Brown FM, Bruemmer D, Collins BS, Hilliard ME, Isaacs D, Johnson EL, Kahan S, Khunti K, Leon J, Lyons SK, Perry ML, Prahalad P, Pratley RE, Seley JJ, Stanton RC, Young-Hyman D, and Gabbay RA on behalf of the American Diabetes Association (2023) Facilitating positive health behaviors and well-being to improve health outcomes: Standards of care in diabetes – 2023. *Diabetes Care* 46(Suppl. 1):S68-S96.