

NEW INSIGHTS INTO THE NUTRITIONAL ECOLOGY OF WILD GORILLAS: IMPLICATIONS FOR CAPTIVE MANAGEMENT

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Abstract

Over the past decade there have been a number of studies on wild gorilla (*Gorilla spp.*) nutrition and we now have a more comprehensive database on the nutritional composition of wild gorilla foods including macronutrients, fatty acids, amino acids and minerals. I will review these findings and discuss a new approach to examining the diets and feeding patterns of gorillas and other primates called the geometric framework of nutrition. I will illustrate how this framework can be used to assess the nutritional priorities of gorillas, and to examine the differences in the nutritional properties of gorilla foods. Gorillas in the wild eat a diverse diet, but just consume a few of these foods on a regular basis. They eat high fiber fruits and leaves, with very low amounts of fat. Mountain gorillas that have a leafy diet prioritize the acquisition of energy and eat leaves that are high in protein. Their diets are about 42% neutral detergent fiber, 18% crude protein and 3% fat. Wild diets lack sodium and gorillas seek it, but other minerals are plentiful. I will discuss how we can use our knowledge from wild gorilla feeding and nutritional ecology to assess the new diet regimes being implemented in zoos and provide insights into the reduction of feeding related problems in captivity.

Relevant Publications

1. Rothman JM, Nkurunungi JB, Shannon B and MA Bryer High altitude diets: implications for the feeding and nutritional ecology of mountain gorillas. For inclusion in: Gursky S, Nanda G High altitude primates. Springer Series Developments in Primatology, *in press*
2. Wasserman MD, Taylor-Gutt A, Rothman JM, Chapman CA, Milton K, and DC Leitman (2012) The estrogenic plant foods of red colobus monkeys and mountain gorillas in Uganda. *American Journal of Physical Anthropology* 148:88-97.
3. Rothman JM, Raubenheimer D, and CA Chapman (2011) Nutritional geometry: gorillas prioritize non-protein energy while consuming protein surpluses. *Biology Letters* 7:847-849.
4. Rothman JM, Dusinger K, and AN Pell (2009) Condensed tannins in the diets of primates: a matter of methods? *American Journal of Primatology* 71:70-76.
5. Rothman JM, Chapman CA, and AN Pell (2008) Fiber-bound protein in gorilla diets: implications for estimating the intake of dietary protein by primates. *American Journal of Primatology* 70:690-694.
6. Rothman JM, Dierenfeld ES, Hintz HF, and AN Pell (2008) Nutritional quality of gorilla diets: consequences of age, sex and season. *Oecologia* 155:111-122.
7. Rothman JM, Plumptre AJ, Dierenfeld ES, and AN Pell (2007) Nutritional composition of the diet of the gorilla (*Gorilla beringei*): a comparison between two montane habitats. *Journal of Tropical Ecology* 23:673-682.

8. Rothman JM, Van Soest PJ, and AN Pell (2006) Decaying wood is a sodium source for mountain gorillas. *Biology Letters* 2: 321-324.
9. Frey JC, Rothman JM, Pell AN, Nizeyi JB, Cranfield MR, and EA Angert (2006) Fecal bacterial diversity in a wild gorilla (*Gorilla beringei*). *Applied and Environmental Microbiology* 72:3788-3792.
10. Rothman JM, Dierenfeld ES, Molina DO, Shaw AV, Hintz HF, and AN Pell (2006) Nutritional chemistry of foods eaten by gorillas in the Bwindi Impenetrable National Park, Uganda. *American Journal of Primatology* 68:675-691.