What do We Know about Natural Diets and how do We Know it?

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Editorial

The care and feeding of primates in captivity, by the human or other, seems based on a somewhat limited scientific basis. Observation of pathologies or limitations that have been related to nutritional or metabolic "misadventures" perhaps has been the foundation [1,2], at least in earlier times for design of "optimal diets." That has changed from recommendations related to "four basic food groups" to the today's more extensive recommendations for humans. But, what is appropriate for our relatives? Diet has been subject to great interest across many fields. Teeth have been examined to separate carnivore from herbivore and frugivores, with some identified as belonging to omnivores. Of course, even herbivores and frugivores occasionally consume meat, so identifying normal diet is more complicated. Semantics may play a role as insectivores are consuming non-plant materials, so are they carnivores?

One approach to identifying dietary proclivities is to examine gastric contents. For an animal captured in the wild, that of course, may simply identify the result of foraging in the environment in which that particular animal was found. Examination of the fossil record for stomach contents is also challenging. Are the contents typical or agonal? Do they represent normal dietary intake or have they been altered by the conditions that led to the animal's death? One approach might be to compare gastric with rectal content. This might prove interesting, especially in mummies, but first requires documentation that the gastro-fecal content in extant animals is actually indistinguishable or how it varies.

Observation of animals in the wild provides a perspective of their normal diet, dependent on course on avoidance of the Heisenberg uncertainty principle – that the observation itself does not alter their behavior [3]. This has proven challenging for some of the more elusive primates. Environmental impact requires consideration. Removal of an animal from its natural habitat to a new environment, no matter how well designed, exposes them to new threats [4]. As menagères were so enthusiastically received by the public, zoological parks were established to provide greater opportunities for city citizens to experience nature. One such park was in London, where even with attention to animal welfare, 50% of 19th century London Zoo residents developed a nutritional disorder, osteomalacia/rickets from vitamin D deficiency [5-7] strength to withstand both gravity and muscle activity. The matter was more complicated than simple ingestion of the vitamin. Simply replacing vitamin D did not correct the problem, as it was commercially available in the D2 form [8,9]. The ingested vitamin had to be transformed into an active form (D3) and the initial step takes place in the skin, catalyzed by sun exposure [6,10] – a limited commodity in 19th century London. This problem especially affected, but was not limited to platyrrhines and catarrhines, although the latter can apparently utilize D2 [11-13]. 500 IU vitamin D3 was required [8,14]. Vitamin D deficiency is not the only cause of rickets. Calcium/phosphate dietary imbalances and phosphate depletion can also produce this disorder as can kidney disease [15,16], emphasizing the importance of attention to appropriate nutrition [17].

References


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