

Fecal isotopes as indicators of weaning and diet in wild Bornean orangutans

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Orangutans have a 7.6 year average inter-birth interval, the longest of any mammal. Suckling occurs throughout that interval, until the birth of the next offspring, but it is unclear how important milk consumption is during that period, as we cannot assess the actual intake amount. Measurement of stable carbon isotope ratios ($\delta^{13}\text{C}$), stable nitrogen isotope ratios ($\delta^{15}\text{N}$) and nitrogen content of feces (%N) provide evidence of the transition between breast milk to solid food. Here we present pilot data on these isotopic ratios from matched fecal samples of mothers and offspring ($n=43$), collected from wild orangutans in Gunung Palung National Park, Borneo, Indonesia. We found that the youngest infant (2.3 yrs) had the highest $\delta^{15}\text{N}$ values overall, indicative of a higher percentage of animal products (milk) in the diet. Older juveniles (5.8 yrs) did not consistently show higher $\delta^{15}\text{N}$ than their mothers. This may indicate variation in suckling frequency or the amount of breast milk consumed per suckling session. Adolescents (10-13 yrs) showed significantly (GLMM, $p < 0.007$) lower $\delta^{15}\text{N}$ than samples taken from the same day on their mothers. This is surprising given that they were eating similar diets. We thus compare the isotopic signature of the plants consumed to examine the sources of this variation. We conclude that analysis of fecal samples collected from wild orangutans can be used to assess the relative importance of breast milk in the diet, but caution that isotopic excretion may also be effected by differences in the isotopic content of the diet.

Funders: NSF (BCS-1638823, BCS-0936199); National Geographic; USFish/Wildlife (F15AP00812, F13AP00920, 96200-0-G249, 96200-9-G110); Leakey; Disney Wildlife Conservation; Wenner-Gren; Nacey-Maggioncalda; Orangutan Conservancy; Conservation-Food-Health; Woodland Park Zoo; Holloman Price; AZA; Ocean Park Conservation; USAID; Arcus