

Dietary fiber and nutritional quality of the foods of Bornean orangutans (*Pongo pygmaeus wurmbii*) in Gunung Palung National Park, West Kalimantan, Indonesia

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Wild Bornean orangutans experience fluctuations in the availability of their preferred food, fruit. During periods of low fruit availability, orangutans rely on fallback foods which are expected to be higher in fiber and generally lower in free simple sugars. However, it is not clear whether there is a consistent relationship between fiber content and the content of other nutrients. Here, we examine acid detergent fiber (ADF) content of 101 plant foods consumed by orangutans in Gunung Palung National Park, West Kalimantan, Indonesia, and the correlation between ADF and other important plant macronutrients. Samples were collected during full-day behavioral follows between 1994-2001. Samples were analyzed in triplicate through a reflux apparatus, which quantified ADF proportion by weight. An ANOVA revealed significant differences between ADF concentrations of different plant parts ($F(5)=20.89$, $p < 0.001$). Post-hoc analyses ($\alpha = 0.005$) determined that bark had a significantly higher ADF concentration than pulp and seeds ($p < 0.001$), leaves had a significantly higher ADF concentration than seeds ($p < 0.001$), and whole fruit had a significantly higher ADF concentration than pulp or seeds ($p < 0.001$). We found a negative correlation between free simple sugar concentration and ADF ($R = -0.63$, $p < 0.001$). However, there was no significant correlation between ADF and protein ($R = -0.14$, $p = 0.17$) or lipid ($R = 0.134$, $p = 0.19$) content. Our findings corroborate work showing that bark and leaves are particularly high in ADF. However, they underscore the fact that determining dietary quality is complex, and that food items that are high in fiber may still be good sources of non-carbohydrate energy.

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