Summary:
The extreme and unpredictable fruiting pattern of Southeast Asian rainforests has led to a number of energy-conserving strategies in Bornean orangutans. Recent studies have demonstrated that during episodes of fruit scarcity, orangutans decrease caloric intake and travel distance and enter negative energy balance, as evidenced by ketosis. Yet, we lack a basic understanding of how negative energy balance impacts overall health in wild primates. Studies on several model organisms have shown that nutritional intake, energetic stress, inflammation, and protective host immunity are inextricably linked, and when an animal is malnourished, the immune response is significantly impaired. Here, I summarize current research from the Tuanan orangutan research station on the relationships between macronutrient balancing and urinary indicators of health. Specifically, I examine the link between nutrient balancing and energy balance, inflammation, and oxidative stress in orangutans. Our findings suggest that orangutans are adapted to a feast and famine ecology and that episodes of caloric reduction may actually be beneficial. Our results add to the growing literature on the nutrition-behavior-health link to the current global obesity epidemic in humans populations around the world.