

VALIDATION OF URINARY C-PEPTIDE MEASUREMENTS AS A POTENTIAL MARKER OF ENERGETIC CONDITION IN MACAQUES

C. Girard-Buttoz^{1,2}, M. Heistermann³, J.P. Higham⁴, S. Wedegaertner¹, D. Maestriperi⁴, A. Engelhardt¹

¹Jr. Research Group Primate Sexual Selection, Dept. of Reproductive Biology, German Primate Centre, Goettingen, Germany, ²Georg-August University, Goettingen, Germany, ³Dept. of Reproductive Biology, German Primate Centre, Goettingen, Germany, ⁴Institute for Mind and Biology, University of Chicago, Chicago Il, USA

Presenter's Email: cgirard-buttoz@dpz.eu

Behaviour and reproduction are strongly influenced by energetic condition, and accurate energetic assessment is crucial for many primate studies. Current methods for determining energy intake and expenditure are often time-demanding, inaccurate or unsuitable for field studies. As such, a non-invasive, reliable and easily applicable method for assessing individual energetic condition is needed. C-peptides, a by-product of insulin production, are a good marker of energetic status. The use of urinary c-peptide (UCP) levels as a measure of body condition and energy balance has recently been validated for great apes; whether this method is also suitable for other primates remains unclear. We tested the suitability of UCPs as markers of energetic condition for catarrhine field studies using captive macaques at the German Primate Centre, and free-ranging macaques on Cayo Santiago, by: 1) investigating the relationship between body-mass-index (BMI, calculated as $\text{body weight (kg)} \div \text{crown-rump length (m)}^2$) and UCPs; 2) conducting a food reduction experiment with daily monitoring of animal body weight and UCP levels; and 3) assessing field conditions (soil/faecal contamination and extended sample thawing). We found a positive relationship between BMI and UCP levels in adult macaques and a negative relationship in non-adults which can be potentially explained by growth-related feeding differences. UCP levels were low during food reduction, and higher following termination of food reduction. UCP levels decreased dramatically after contamination with faeces and extended thawing periods. We conclude that UCPs have potential as markers of adult macaque body condition if contamination and thawing of samples can be avoided.

Keywords: behavioural ecology, body condition, metabolism, field studies