

could be used, or the heating switched off completely during the day time which would result in a reduction of energy used and money saved. The results from this study have large ramifications for wasting less energy and implementing systems which would be more environmentally friendly and cost effective, whilst still meeting the welfare needs of the animals.

Further info: Vicky Melfi. Email: vicky.melfi@paigntonzoo.org.uk

---

12<sup>th</sup> BIAZA Annual Symposium on Zoo Research – Highly commended talk

### **The development of an enzyme immuno-assay to non-invasively measure adrenal activity in the okapi (*Okapia johnstoni*), black rhino (*Diceros bicornis*) and Asian elephant (*Elephas maximus*)**

Rebecca Watson, Katie Edwards, Sue Walker, Chester Zoo, Coralie Munro, University of California Davis and Janine Brown, Smithsonian Conservation Biology Institute Centre for Species Survival

There are many problems associated with health and reproduction that are often related to adrenal activity. Endocrinology can be used to assess adrenal activity and lead to measures which resolve such problems. This study has developed an enzyme immuno-assay to non-invasively measure adrenal activity in okapi faeces, Asian elephant faeces, black rhino faeces and black Rhino urine. In order to establish an accurate and repeatable method, a range of factors were manipulated to produce a high quality assay. Nunc maxisorp II and immulon II plates were both tested, as well as the direction and amount of light during incubation, plate loading temperature, substrate reagent temperature and the addition of a non-specific IgG. The assay has been validated both chemically, using a parallelism and interference assessment, and biologically through individual responses to a challenging event. The optimum assay conditions include room temperature substrate reagents and dark incubation. This enzyme immuno-assay to measure glucocorticoids provides a comprehensive method which can be utilised for a potentially vast range of species.

Further info: Sue Walker. Email: s.walker@chesterzoo.org

---

12<sup>th</sup> BIAZA Annual Symposium on Zoo Research – Winner, best poster

### **A Madagascan mixer**

Jackie Noble and Kathy Baker, Newquay Zoo

The use of mixed species exhibits in zoological collections is now a common way to mimic a natural environment. A successful mixed exhibit provides an enriched environment for all species involved. Specific goals may include increased activity levels, as the species interact directly (through social interaction or avoidance) or indirectly (through olfaction of scents left by a contra-specific). Some negatives involved in mixed-species exhibits may include aggression resulting in injury, inhibited reproduction, disease transmission, or nutritional problems. Furthermore, the species chosen must not disturb each other, especially during times of rest, as this may cause stress. In order to ensure a mixed species exhibit is successful, it is necessary to monitor polyspecific introductions. At Newquay Zoo a Madagascan exhibit was completed in March 2010. This included a mixed species enclosure housing *Eulemur coronatus* (1.1) and *Mungotictis decemlineata* (1.1), a combination of species not documented in any other zoological collection. The novelty of the crowned lemur/ narrow striped mongoose exhibit meant it was important to document the introduction and any behavioural changes that occurred as a result. The crowned lemurs were introduced to the enclosure on 19/03/2010 and observations began the following day. At this time the narrow-striped mongooses were housed in quarantine, due to restrictions this meant data could not be collected on this species. Therefore only the behaviour of the crowned lemurs was observed for the duration of this study. The behaviour and enclosure use of the male and female crowned lemurs was evaluated using 30-minute instantaneous focal observations. Scent marking was recorded as event behaviour and tallied throughout the observation. There were four conditions during this study; 1 - pre-introduction of the mongooses, 2 - 'disruption' period, 3 - introduction, and 4 - post introduction. Recorded behaviours were separated into general categories; solitary active, social active, solitary inactive, social inactive and out of sight. Most notably solitary active behaviours increased from Condition 1 to Condition 4 for both the male (Mean  $\pm$  Standard Error Mean) (21.86%  $\pm$  2.15799 to 35.97%  $\pm$  4.38466) and female (21.86%  $\pm$  2.36018 to 35.97%  $\pm$  3.76281). Enclosure use was analysed using the spread of participation index (SPI). The SPI decreased from pre-introduction to post introduction for both the male (0.963  $\pm$  0.1804 to 0.803  $\pm$  0.04115) and female (0.950  $\pm$  0.02382 to 0.842  $\pm$  0.03526). This indicated that both lemurs used the enclosure to a greater extent as the study progressed. The average scent mark count per observation increased from Condition 1 to Condition 4 for the male (6.98  $\pm$  1.12538 to 8.92  $\pm$  1.30153) and female (0.05  $\pm$  0.04714 to 2.12  $\pm$  0.80330). The significance of the aforementioned values is yet to be determined. Randomisation tests will be carried out and the findings will be available by July 2010. After further analysis, if crowned lemurs spend significantly more time carrying out active behaviours, significantly increase enclosure use and rate of scent