

Investigating Adrenal Responses to Transport and Subsequent Acclimation to a New Environment in Orangutans

Overview of Research

Orangutan transport is a necessary means for the SSP to allow for proper population management and fulfillment of breeding recommendations. While transport is usually a somewhat stressful experience to an individual, the intensity of the stress will depend on a variety of factors, such as age, gender, history, temperament, and previous transport experience. Transport itself is a rather short-lived stressor. A normal stress response during and after transport should therefore be represented by a relatively brief spike in physiological indicators of adrenal activity. In addition to transport stress, there is also the stress associated with a new environment, quarantine, and adapting to new routines, keepers, and enclosure mates.

Physiological response to transport and translocation have been extensively studied in farm animals (Le Neindre et al. 2001), but very little data exists for transport stress of zoo and wild animals. In a study of transport stress in tigers Dembiec et al. (2004) found a significant difference in the intensity and length of the physiological stress response depending on previous transport experience. Experienced animals showed a shorter, less intense period of “stress” hormone (i.e. fecal glucocorticoid) elevation than “naïve” individuals. It is to be expected that age, temperament, previous transport experience, and whether or not animals had been acclimated to transport through training, could all play a major role in transport stress response in orangutans.

Aims of Project/Methodology

In this study we plan to physiologically monitor SSP orangutans being transported between AZA accredited zoos in 2013 and 2014 to identify possible correlates of the intensity of stress responses during and after transport and during adaptation to a new environment. We are aiming to monitor 10-15 orangutan translocations via fecal glucocorticoid analysis prior, during, and after transport. Fecal glucocorticoid monitoring is a well-established method for detecting changes in adrenal activity (Mostl and Palme 2002; Millspaugh and Washburn 2004).

The fecal collection schedule for each individual is as follows: 10 weeks of every other day sample collection (35 samples) pre-transport, and 20 weeks of every other day collection (70 samples) post-transport. On the day of transport, a sample is to be collected from each defecation for 24 hours (samples to be collected from the crate as soon as it's feasible). Details on collection protocol are attached.

Fecal samples will be handled and disposed of in accordance with our lab's standard operating procedure. Any samples that do not contain proper labeling, have thawed out longer than 24 hours, or have been contaminated with water or defective cooling packs

during shipment will not be included in analysis. Fecal collection materials and protocols will be shipped to each institution prior to collection.

In addition to fecal collection, personality assessments and behavioral/event notes will be completed by each institution.

We would like to request all samples be sent to the Brookfield Zoo according to the shipment instructions below. Once the samples arrive, we will analyze them in our Endocrine Lab using EIA (enzyme immunoassay) protocols to measure fecal glucocorticoid metabolites (“stress” hormones). Hormone data on all study animals will be compared across individuals with regard to age, gender, temperament, history, previous transport experience, and whether pre-transport training was conducted.

Shipping Instructions

Fecals need to be shipped FedEx Overnight on dry ice or cold packs—boxes containing Styrofoam inserts are ideal. The Brookfield Zoo will cover the costs of shipment: FedEx account # 1044-6104-2. Please contact us prior to shipment to establish when we can receive the samples and track the shipment. Please only ship Monday-Wednesday to ensure samples will arrive on a weekday in case there is any delay during shipment.

Contact Info:

Jocelyn Bryant, M.S. (Endocrinology Lab Manager)

Phone: 708-688-8843/8831

Jocelyn.Bryant@CZS.org

Shipping Address:

Jocelyn Bryant

Brookfield Zoo

Endocrinology Lab

3300 Golf Road

Brookfield, IL 60513

Project Significance and Acknowledgement

Orangutans are particularly sensitive to relocation and acclimating to new exhibits. Negative affect can permanently impact behavior as well as longevity (Weiss et al. 2011). Bornean orangutan, *Pongo pygmaeus*, is listed as “endangered” and Sumatran orangutan, *Pongo abelii*, as “critically endangered” on the IUCN Red List of Threatened Species (IUCN 2012). It is imperative we discover better management practices to improve translocation stress. Ultimately, increased knowledge from this study may help with preparation for orangutan transport as well as general management decisions surrounding transport.

Results will be shared with the SSP through a final report, publication in a pertinent journal, and presentations at SSP and AZA meetings as well as any other relevant venues. Any drafts will be provided to you for review prior to submission for publication and all reports and publications will be sent to collaborators. The SSP and collaborating institutions will be acknowledged in any report, publication, or presentation given on this study.

References

Dembiec DP, Snider RJ and AJ Zanella. 2004. The effects of transport on tiger physiology and behavior. *Zoo Biology* 23:335-346.

IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Downloaded on **15 February 2013**.

Le Neindre P, Terlouw C, Boivin X, Boissy A and J Lensink. 2001. Behavioral research and its application to livestock transport and policy: a European perspective. *Journal of Animal Science* 79(E Supplement):E159-E165.

Millspaugh JJ and BE Washburn. 2004. Use of fecal glucocorticoid metabolite measures in conservation biology research: considerations for applications and interpretation. *General and Comparative Endocrinology* 138:189-199.

Mostl E and R Palme. 2002. Hormones as indicators of stress. *Domestic Animal Endocrinology* 23:67-74.

Weiss A, Adams MJ and JE King. 2011. Happy orang-utans live longer lives. *Biology Letters*, published online June 29, 2011 doi: 10.1098/rsbl.2011.0543.