

© 2016 Universities Federation for Animal Welfare  
The Old School, Brewhouse Hill, Wheathampstead,  
Hertfordshire AL4 8AN, UK  
www.ufaw.org.uk

*Animal Welfare* 2016, 25: 325-329  
ISSN 0962-7286  
doi: 10.7120/09627286.25.3.325

## **Relationship between behavioural diversity and faecal glucocorticoid metabolites: a case study with cheetahs (*Acinonyx jubatus*)**

LJ Miller<sup>\*†‡</sup>, CB Pisacane<sup>‡</sup> and GA Vicino<sup>§</sup>

<sup>†</sup> Chicago Zoological Society, Brookfield Zoo, 3300 Golf Road, Brookfield, IL 60513, USA

<sup>‡</sup> Institute for Conservation Research, San Diego Zoo Global, 15600 San Pasqual Valley Road, Escondido, CA 92027, USA

<sup>§</sup> Collections Husbandry Science, San Diego Zoo Global, PO Box 120551, San Diego, CA 92112, USA

\* Contact for correspondence and requests for reprints: lance.miller@czs.org

### **Abstract**

---

*The ability to monitor the welfare of animal collections in zoological institutions is critical to the mission of these facilities. Historically, zoos have utilised negative indicators of welfare, such as stereotypic behaviour to examine and monitor collection animals. However, absence of stereotypic behaviour or negative indicators of welfare does not indicate that an animal is thriving. The goal of the current study was to continue efforts to validate behavioural diversity as an indicator of welfare using cheetah (*Acinonyx jubatus*) as a model species. Behavioural and faecal glucocorticoid metabolite data were collected on 18 cheetah at the San Diego Zoo Safari Park over a period of three months to explore the relationship between behavioural diversity and adrenal hormones related to the stress response. Results suggest that behavioural diversity can be utilised as an indicator of animal welfare to monitor animal collections within zoological facilities. However, additional research with other species should be conducted to better understand behavioural diversity as a positive indicator of animal welfare. We hope this manuscript will increase discussion surrounding behavioural diversity as well as increase efforts to validate it as an indicator of welfare.*

---

**Keywords:** *Acinonyx jubatus, adrenal activity, animal welfare, behavioural diversity, cheetah, faecal glucocorticoid metabolites*