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The Old School, Brewhouse Hill, Wheathampstead,
Hertfordshire AL4 8AN, UK
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Development of an evidence-based welfare approach for cheetahs (*Acinonyx jubatus*) under human care

B Fischer[†], M Flint[‡], K Cole[†] and KA George[†]*

[†] College of Food, Agricultural, and Environmental Sciences Center for Human-Animal Interactions Research & Education, Department of Animal Sciences, The Ohio State University, 2029 Fyffe Court, Columbus, OH 43210, USA

[‡] College of Food, Agricultural, and Environmental Sciences Center for Human-Animal Interactions Research & Education, College of Veterinary Medicine, Department of Veterinary Preventive Medicine, The Ohio State University, 1920 Coffey Road, Columbus, OH 43210, USA

* Contact for correspondence: Fischer.747@osu.edu

Abstract

*Societal concern for animals under human care has influenced our approaches to advance animal welfare in a variety of contexts. The Animal Programs Department at the Columbus Zoo and Aquarium sought partnership with the Center for Human-Animal Interactions Research & Education (CHAIRE) at The Ohio State University to develop a holistic welfare approach for the animals within their department using a focal species, the cheetah (*Acinonyx jubatus*). A one-year project using the Five Domains Animal Welfare Model collected data over six 60-day periods to evaluate long-term cortisol production and behavioural observations of cheetahs under changing environmental factors. Species and individual histories were incorporated with behavioural observations and hair cortisol production, giving a holistic view of welfare. Cortisol and behavioural data were analysed using linear models to compare cheetahs at population and individual levels. Participation in a cheetah run activity, housing occupancy, and 60-day period were found to influence all behaviours within the population and stereotypic behaviour also differed within individual cheetahs. No differences in hair cortisol concentrations were found for the group, but further analysis revealed differences within individuals throughout the study. No correlation of stereotypic behaviour and cortisol levels were found. This study created a welfare assessment protocol that can be used within zoological institutes and was the first to measure cortisol concentrations in hair in cheetahs.*

Keywords: animal welfare, behaviour, cheetah, hair cortisol, human care, zoo