

Narrative 12: (Zoo) animal behaviour

While aspects of animal behaviour had been a part of my zoo studies from early on

Clauss et al. (2002) Fütterungspraxis in der Haltung von Elchen. *Tierärztl Praxis G* 30:408-418.

I have expanded this more recently, using (often video-based) behavioural observations to investigate aspects of basic physiology

Guerra Aldrigui, ..., Clauss (2018) Effect of different feeding regimes on cecotrophy behaviour and retention of solute and particle markers in the digestive tract of paca (*Cuniculus paca*). *Comp Biochem Physiol A* 226: 57-65

Pucora, ..., Clauss (2019) Resting postures in terrestrial mammalian herbivores. *J Mammal* 100: 552-563

Polotzek, ..., Clauss (2023) Behaviour indicative of coprophagy in zoo-managed porcupine (*Hystrix indica*). *Mamm Biol* 103: 633-638

Bösch, ..., Clauss et al. (2023) They chew by night? Nighttime behaviour in a 'ruminating' primate, the proboscis monkey (*Nasalis larvatus*). *J Zool* (online) doi 10.1111/jzo.13128.

of general animal husbandry

Schiffmann, ..., Clauss et al. (2018) When elephants fall asleep: a literature review on elephant rest with case studies on elephant falling bouts, and practical solutions for zoo elephants. *Zoo Biol* 37: 133-145

Schiffmann, ..., Clauss (2020) Soft and persistent – The influence of sand-flooring and calves on the resting behavior of a zoo-kept African elephant (*Loxodonta africana*) group. *Zoo Biol* 39: 56-62

Frei, Clauss et al. (2021) Use of running plates by floor housed rats: a pilot study. *Lab Anim* 55: 521-530

Schiffmann, ..., Clauss et al. (2022) From left to right all through the night - characteristics of lying rest in zoo elephants. *Zoo Biol* 42: 17-25

and of feeding-related behavioural management

Michel, Clauss et al. (2021) Visitors feeding roughage to zoo herbivores: a new feeding concept offering species-appropriate animal enrichment and visitor attraction at the same time. *Zool Garten NF* 89: 1-16

Enemark, Clauss et al. (2023) The behavioral effects of feeding lean meat vs whole rabbit carcasses to zoo jaguars *Panthera onca*. *J Zoo Aquar Res* 11: 324-328

Friedmann, ..., Clauss (2023) Activity budget and behaviour of giant otters (*Pteronura brasiliensis*) at Parken Zoo, Eskilstuna, Sweden. *J Zoo Aquar Res* 11:356-365

Seyrling, Clauss et al. (subm.) Breaking the spell: changes in the behaviour of two zoo-kept tigers (*Panthera tigris*) after exposure to a distinct feast-and-fast feeding regime. *Zoo Biol* (under review)

This work was so far characterized by (i) 'manual' video evaluation (i.e., a person reads the behavioural data while watching the video), and (ii) a haphazard array / collection of video equipment burrowed / composed on a case-by-case basis, with specific technical challenges each time. In the future, we hope to establish a standard hardware and software pipeline of video recording and data processing.

The applied use of artificial intelligence (AI) in video behavioural evaluation is currently characterised by a dilemma: On the one hand, using AI for the evaluation of video recording of animals does not represent an academic challenge for researchers working in computer science any more. Its feasibility has been demonstrated repeatedly. On the other hand, artificial intelligence cannot be acquired as an 'off-the-shelf' solution, but must be set up and trained for each specific project – a task that is currently mostly beyond the capacities of those researchers simply interested in animal behaviour.

This dilemma leads to a situation where it seems hardly possible to attract cooperation on the use of AI for monitoring animal behaviour with computer scientists. This realization has led us to seek cooperation with other zoo research groups to make first steps towards establishing an AI setup; it is an aim to jointly develop AI approaches to zoo animal behavioural management (currently on sleep in elephants and ungulates).