

Cortisol is not enough: A complex stress reaction in tethered goats

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Abstract

The purpose of this study was to assess the diversity of physiological stress responses elicited by tethering versus loose holding in the Swedish domestic goat (Capra hircus). Eight goats were randomly divided into two groups and the experiment was performed in a cross-over design. Six goats had implanted transmitters that registered heart rate and arterial blood pressure telemetrically and blood samples were taken on separate days. Heart rate increased around feeding both when the goats were held loose in pairs, and when they were tied up. When the goats were tethered, the heart rates and blood pressures were higher, and the concentrations of β -endorphin and oxytocin lower, compared to when held loose in pairs. In conclusion, housing and the company of another animal affect arterial blood pressure, heart rate, and the concentrations of β -endorphin and oxytocin in goats, but the cortisol and vasopressin concentrations did not differ between the treatments. The higher arterial blood pressure and heart rate, and lower concentrations of β -endorphin and oxytocin in tethered goats indicate that being tied up may be more stressful for the goats compared to being held loose. The use of single measures, eg cortisol concentrations, was not sufficient to give an accurate picture of the animals' response to the management system. This study demonstrates the importance of using a wide variety of physiological measures when evaluating stress in animal welfare research.

Keywords: animal welfare, β -endorphin, blood pressure, heart rate, oxytocin, vasopressin