

# HYPOTHALAMIC-PITUITARY-ADRENAL AXIS RESPONSE TO CHRONIC SOCIAL STRESS IN RED DEER STAGS (*CERVUS ELAPHUS*).

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To determine the effect of chronic social stress on hypothalamic-pituitary-adrenal axis (HPA axis) activity and function, 6 red deer stags (2 yrs) were introduced into unfamiliar groups of stags (6 groups of 5 animals) every second day for a total of 12 days.

HPA axis activity and function were quantified in the 6 treatment animals prior to and following the repeated mixing treatment. HPA axis activity in animals at pasture was determined by measuring plasma cortisol concentrations in blood samples collected over 24 h (72 x 20 min samples) using a remote blood sampling device (DracPac). HPA axis function was determined in the same animals at pasture by measuring plasma cortisol responses to remote bolus infusions of ACTH (0.04 iu/kg) and CRH (0.25 ng/kg).

HPA axis activity as assessed by mean 24 h cortisol concentrations, declined significantly ( $p < 0.05$ ) from an average concentration of  $12.9 \pm 0.8$  ng/ml to  $5.3 \pm 1.3$  ng/ml following the application of the repeated mixing stressor. Significant changes were also observed in HPA axis function following the repeated mixing stressor with peak concentrations of cortisol in response to ACTH and CRH challenge declining significantly ( $p < 0.01$ ) from  $42.1 \pm 2.8$  ng/ml and  $20.8 \pm 1.3$  ng/ml prior to mixing to  $32.6 \pm 2.6$  ng/ml and  $11.2 \pm 1.7$  ng/ml after mixing, respectively.

The HPA axis response to chronic social stress in red deer stags is characterised by a lowering of basal cortisol concentrations (hypocortisolemia) and a reduction in the responsiveness to ACTH and CRH.