Impact of housing management in horses using hair cortisol as a biomarker

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INTRODUCTION

• Horses are typically housed in individual stalls or in similar groups with respect to age and sex in an effort to avoid possible injury from aggressive interactions [1] [2].
• Confinement and social isolation may contribute to the activation of the stress response [2].
• Chronic stress causes an elevated baseline of HPA activity [3].
• Prolonged effects of the hormones in the stress system can lead to health issues and disorders [3].
• Traditional cortisol measurements give acute and short-term circulating levels of cortisol. Utilizing hair cortisol will allow a reflection of long-term cortisol concentrations [4].

OBJECTIVE

• Determine if there is an effect of housing on long-term hair cortisol in horses transitioned from outdoor group housing to individual housing in box stalls.
• Determine if there is a correlation between cortisol and HR, behavior, and reactivity.

MATERIALS & METHODS

• 11 Quarter Horses (3.59 ± 1.36 yr) consisting of five mares and six geldings housed at The Ohio State University equine facility.
• Two periods were analyzed: school years 2017-2018 and 2018-2019; Months of October – March.
• Hair cortisol was analyzed at The Ohio State University College of Nursing with an ELISA.
• Five of the period 2 horses were used in novel object and sensory sensitivity tests.

RESULTS & DISCUSSION

• Results indicate that whether these horses were housed in outdoor conditions with conspecifics or inside in individual box stalls, the hair cortisol concentrations were not significant (p > 0.05).
• In contrast with fecal cortisol studies in which the short-term cortisol response was analyzed, horses showed an increase in cortisol concentrations while housed in total isolation and a trend of increased cortisol concentrations as social isolation increased [5].
• In agreement with a previous study utilizing plasma cortisol, the hair cortisol concentrations of these horses in the novel object and sensory sensitivity tests did not always reflect the animal’s behavioral responses [6].

CONCLUSION

• Housing types utilized in this study for these horses does not change their long-term cortisol concentrations.
• Physiological measurements do not always reflect a horse’s behavioral response and should all be utilized in studies attempting to indicate markers of chronic stress.

REFERENCES