

FINAL REPORT



Studying the Impact of Lighting on Stabled Horses

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RESULTS: Researchers learn how to study sleep quality in horses and the effects of stable lighting.

SUMMARY: Morris Animal Foundation-funded researchers at Hartpury University, United Kingdom studied how different lighting systems affected the behavior, circadian rhythm (body clock) and well-being of stabled horses.

THE PROBLEM: Sleep is critical to the well-being of animals and can be greatly affected by the animal's environment. Little is known about how variations in lighting may interfere with sleep-wake cycles of stabled horses and if lighting impacts their sleep quality and, in turn, their overall health and behavior.

THE PROJECT: Researchers evaluated the impact of two lighting systems – fluorescent lighting and a customized circadian LED lighting system – on the quality of sleep and circadian rhythm (body clock) in 10 stabled horses. The team collected data on frequency of blink rates, sleep behavior and clock gene expression through analysis of hair follicles.

PROJECT FINDINGS: Although behavioral profiles differed for each horse, researchers did not detect any statistically significant differences in blink rate or sleep behavior. The team believes this is due in part to the good standard of horse care in the study population but also is due to the large variation between individual horses. They also did not detect any statistically significant differences in clock gene expression between the two lighting conditions, although the profile under red/white light was more pronounced for one clock gene measured.

This was basic research which can be useful in considering the influence of lighting and the need for a routine that enables exclusive light and dark periods for stabled horses. Under the red-light system, the team was able to detect strong clock gene rhythmicity in an equestrian center where lights are turned off and horses are undisturbed at night. This contrasts with previous findings of no rhythms in these genes in a study conducted at a racehorse yard where horses experience light disturbances overnight.

POTENTIAL IMPACT: Results of this study have contributed to how adjustments to stable lighting might be used to promote healthy sleep patterns and optimize equine wellbeing. From an applied perspective, during the winter months late night checks can become problematic in terms of lighting. The red-light system used in this study provides an environment during the dark period where it is possible for humans to see whilst enabling the horse to achieve a normal sleep pattern without disturbing their circadian rhythm. Next steps will look at how a red-light system could be used in a therapeutic setting or in competition horse yards where horses are kept in different stables with variable lighting.

Thanks to the generous sponsors of this study!