

The Effect of Enrichment on Activity Level of Riding School Horses Housed in a Combination Barn.

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Introduction: As the number of people riding and owning horses have increased over the years, more and more horses are being housed at livery yards; typically in stables that measure between 9 m² and 13 m². This restricts the horse from displaying certain natural behaviours, due to restricted space and isolation, which can have a negative impact on welfare. The use of combination barns (a type of group housing, where the horse can choose to be inside or outside) are seen as an improvement in welfare and environmental enrichment can also be used to improve welfare by encouraging certain behaviours. The objectives of this study were to measure time budgets of and the distance travelled by horses housed in a combination barn when provided with enrichment, and to compare to the same measures when no enrichment was provided.

Material & Methods: Eight gelded riding school horses were housed, in previously established pairs, in the combination barn on the Brackenhurst Campus of Nottingham Trent University. The combination barn comprises inside space of 26.5 m² bedded with chopped rape straw, with free access to wood chipped outside space of 180 m². Having been acclimatized for 48 hours, each pair were then recorded via video footage (DVR365 system) and GPS units (Garmin Edge 500) for a total of 16 hours (2x 8 hours overnight) with enrichment followed by a repeat without enrichment. The enrichment used was the horses usual hay ration placed in several locations in the outside part of the combination barn, rather than placed in two locations on the inside of the combination barn as it usually is. Videos were analysed with an ethogram to determine the frequency of foraging (eating, sniff/ lick/ chew, drinking) and locomotor event behaviours displayed, whilst distance travelled was downloaded directly from the GPS Units. Data were analysed using IBM SPSS Statistics 22, with data found to be non-parametric by a Kolmogorov-Smirnov and so tested using a Wilcoxon Signed Rank Test.

Results: Horses travelled significantly ($P=0.0019$) further when enrichment was provided compared to when no enrichment was provided (median distance \pm standard deviation; 1.75 ± 0.21 km and 1.35 ± 0.18 km respectively). No significant difference was found in frequency of behaviours displayed between the two conditions.

Discussion & conclusions: Horses in this study travelled further over a period of 16 hours when enrichment was provided. This is in agreement with Hoffman (2012), who found when horses were provided with enrichment their activity increased by 47%. However, it is recognised that factors such as weather, time of year and nature of the pair of horses may affect findings. It is uncertain if the results of this study are due to order effects, horse preference between outside or inside environments, or enrichment, or a combination of these factors. However, locomotor behaviour is typically restricted by individual housing and this may contribute to reduced welfare. This area warrants further investigation as it could be an inexpensive way of increasing locomotion in housed horses, and thus improving their welfare.

References: Hoffmann, G., Bentke, A., Rose-Meierhöfer, S., Berg, W., Mazetti, P. and Hardarson, G. (2012). Influence of an active stable system on the behavior and body condition of Icelandic horses. *Animal*, 6(10), pp.1684-1693.