

## The impact of paddock design on the behaviour of the domestic horse (*Equus caballus*)

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The design of a captive environment should facilitate the expression of the natural behavioural repertoire of the species concerned. The domestic horse (*Equus caballus*) is a social, herd dwelling species that is often housed in isolation from conspecifics or kept in groups in paddock enclosures. Although the latter allows for social interaction and does not restrict movement per se, it may not promote natural activity patterns or group cohesion. The aim of the current study was to assess the impact of two different paddock designs on the behaviour of a stable group of horses (n=6: 2 mares, 4 geldings).

The paddock designs tested were adjacent and grassed similarly, but configured differently. A central paddock (75 x 75m) designated NT, was surrounded by a track 1.6-5.5m wide, designated T. The horses were turned out in their group into T or NT for 3 consecutive days. Their behaviour was recorded for one hour three times each day (10.00, 13.00, 16.00 hrs). Within each observation period of one hour focal sampling was used, each individual horse being observed for a 10 minute period. They were then moved to the other enclosure type for a further 3 consecutive days, followed by a repeat of each condition. When turned out the horses were fitted with a global positioning system device (Garmin Forerunner 305) to monitor distance travelled and speed for the period 10.00-17.00 hrs. The mean percentage of time spent in each behavioural state (standing alert, standing resting, walk/trot, grazing, lying, social interaction) during the periods observed was calculated. Behaviour during social interactions was classified as either affiliative (approach, follow, friendly contacts, mutual grooming) or agonistic (approach and retreat, bite, chase, head threat).

The horses travelled significantly further in T than in NT (paired samples t-test:  $t(5) = 11.74$ ,  $p < 0.001$ ) and moved significantly faster (Wilcoxon signed rank test:  $z = -2.21$ ,  $p = 0.03$ ).

See Table 1. When the percentage of time spent in each behavioural state in T and NT was compared some significant differences were found. A significantly higher percentage of time was spent active (walking /trotting) in T than in NT (paired samples t-test:  $t(5) = 5.74$ ,  $p = 0.002$ ). Standing alert was only recorded in T (paired samples t-test:  $t(5) = 3.48$ ,  $p = 0.02$ ). A significantly higher percentage of time was spent grazing in NT than in T (paired samples t-test:  $t(5) = -3.58$ ,  $p = 0.016$ ). Significantly more social interaction occurred in T than in NT (paired samples t-test:  $t(5) = 5.93$ ,  $p = 0.002$ ). See Figure 1. In T, 91% of social interactions were affiliative and 9% agonistic, whereas in NT 29% were affiliative and 71% agonistic. No difference was found in the percentage of time spent standing resting or lying down in T and NT.

The benefits of housing horses in groups as opposed to individually have been demonstrated in previous studies. In addition to better satisfying the behavioural needs of the horse it has been found that group housed horses adapt more easily to training and display less undesirable behaviour than those housed individually (Rivera et al. 2002; Søndergaard and Ladewig 2004; Visser et al. 2008). However, individual housing is frequently selected by horse owners in preference to group housing to avoid the risk of injury during agonistic encounters. Fureix et al. (2012) suggest that management practices may well contribute to aggressiveness in horses and that the conditions under which we keep horses should be reviewed. The findings of the present study indicate that the design of the enclosure in which groups of horses are kept affects the nature of social interactions. The T paddock design resulted in reduced intra-group aggression. However, this paddock design also reduced the time spent grazing and increased vigilant behaviour. Although the results demonstrate that a paddock system including tracks

may facilitate group cohesion and more natural movement patterns, the long-term impact on behaviour and welfare requires further investigation.

**Key words: Horses, social behaviour, management, housing, paddock**

#### **References:**

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