Agonistic and affiliative interactions in group housed riding horses (*Equus caballus*)

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Group housed horses at a stud farm/riding stable in Belgium were observed on 17 days between 21 February and 25 April 2008, totalling 54hr25min of detailed data. The original group consisted of 8 Irish Cob mares, 1 Warmblood mare, 1 Arabian gelding and 2 Arabian mares. The group had been established in December 2007. During the course of the study 5 horses were removed from the group and 2 foals were born. 3 highly pregnant mares were housed adjacent to the group for part of the period. Horses were regularly used for lessons. Available surface area differed with the group on pasture at the end. Continuous all occurrence sampling of 10 agonistic and 2 affiliative behaviours was carried out for all group members present.

Overall the group showed a frequency of 44.75 agonistic interactions per hour and 11.25 affiliative per hour. Of those agonistic interactions 46.3% were threats while 47% were less active interactions (displacement, being avoided), leaving only 6.7% more aggressive interactions (mainly biting, some kicking and chasing).

The effect on acting agonistically was not significant for age (p=0.1591) and borderline significant for density (p=0.0627). The analysis of the frequency of affiliative interactions showed there is no significant effect of age (p=0.1865) or density (p=0.7923). Agonistic and affiliative interactions were not significantly correlated (p=0.72). Affiliative behaviour a horse received showed a borderline effect (p=0.0787) on agonistic behaviour, as did the interaction between received agonistic and affiliative interactions (p=0.0725). Received agonistic interactions had a borderline negative effect (p=0.0656) on affiliative behaviour.

A dominance hierarchy was calculated based on agonistic interactions using Empirical Bayes' estimates based on Poisson regression with random effects. Agonistic behaviour expressed to other horses was significantly effected by relative rank (p=0.0243). Overall horses tended to be 3.7 times more aggressive towards lower ranking horses compared to higher ranking horses. Affiliative behaviour shown to other horses was not significantly influenced by the rank of the social partner (p=0.7915). Some individuals did show a significant effect whereby they showed more affiliative behaviour towards lower ranking individuals.

This study was a small project to look at a practical situation of riding horses being kept in group housing. The frequent changes in group composition and available surface made it possible to look at agonistic and affiliative interactions in such circumstances. This is useful as instability in group composition is often used as main reason not to keep horses in social groups. The results from this study showed a borderline effect of density on agonistic behaviour. In reality it was also influenced by practical details, like a narrow paddock with only 2 hay crates on the smallest surface. Rank in a dominance hierarchy, based on agonistic behaviour, had a significant effect on the agonistic behaviour expressed towards higher or lower ranking horses. No injuries or escalating fights were observed. This study shows it is possible to keep a group of riding horses in a social context without excessive aggression.

Key words: horse, group housing, social interactions

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