Stalmaat

Groepshuisvesting

Hartmann et al., 2012: The authors argue that the domestic environment should, whenever possible, offer horses the opportunity to socialize with other horses. This can best be achieved by keeping horses in groups. There may not be one best method that should be chosen in practice, because factors such as available space, feeding regime or individual horse characteristics must be taken into account. However, this review has revealed that, despite the ample work done in other species related to keeping animals in groups, there is insufficient scientific data on horses. This lack of knowledge may hinder objective decisions in practice that could optimize management and thereby ultimately improve and safeguard horse welfare and human safety. Keeping horses in mixed age groups has clear advantages, especially for young horses.

Fureix et al., 2012: Observing groups of horses in paddocks of about 100 m2 per horse up to 75,000 m2 per horse, Jorgensen et al. (2009) reported that horses with the smallest space allowance showed the highest mean number of aggressive interactions (4.6 h−1) as compared to all other batches (1.3 h−1). Furthermore, it has been suggested that there is a major impact of roughage availability on the prevalence of agonistic behaviours. Aggressive interactions dropped by half when foraging opportunities were provided in the paddock (Benhajali et al., 2009). Favouring pastures over paddocks when possible, ensuring roughage availability, multiplying the sources of food and ensuring a reasonable density are interesting ways of lowering the risks of aggressions. Data are still missing on the ideal group composition and little is known about the impact of group size but it is likely that a limited size (4–6 in feral families) promotes a more harmonious social life.

Henderson, 2007: Herds also maintain peace through respect of personal space (generally about 6-10 ft) within which they will allow only those with whom they have an intimate relationship (Davidson, 2002). Thus successful group turnout must provide sufficient space so that horses are not constantly threatened, and/or threatening, to protect personal space.

Rose-Meierhöfer et al., 2010: Wild horses cover an average distance of 6 km per day (Zeitler-Feicht, 2001*),* depending on seasonal pasture conditions, grass quality, climatic conditions, and the distance between watering places. A similar behavior can be found in group housing of horses in open barns. It was observed that horses in open barns with paddock walk 1.2 km per day, whereas horses in boxes cover a distance of merely 0.17 km per day. In open barns with different functional areas and higher feeding frequencies, walking distance per day could be increased to 4.8 km (Frentzen, 1994). Therefore, group housing systems have positive effects on the activity of horses (Jørgensen & Bøe 2007). Increased space with leafy paddock or pasture also helps to increase the activity per day. However, an expanded sand-paddock (540 m^2 instead of 270 m^2 for six horses) has no influence on activity behavior (Hoffmann et al., 2009). The highest space restriction with the strongest negative effect on activity behavior can be found in individual stabling in boxes (Brehme & Rose, 2007).

Visser et al., 2008: It is concluded that sudden isolated stabling is stressful to young and naïve horses, resulting in a high prevalence of stereotypies and abnormal behaviours. This study also provided some support for the notion that social stress in horses may be associated with a blunted adrenocortical response to CRF challenge.

Christensen et al., 2011: Little is known about how repeated regrouping affect horse behaviour and welfare, and it is unknown whether horses may adapt to regrouping. In this study, we aimed to investigate the effects of an unstable group structure, caused by weekly regroupings, on behaviour and frequency of injuries in young horses. In conclusion, we found that group instability, caused by weekly regroupings, led to an increase in the level of agonistic interactions among young, well-socialized horses that were all familiar with each other prior to the study. The frequency of agonistic interactions immediately after regrouping did not decrease as the six-week experimental period progressed and thus the horses did not appear to adapt to regrouping. Although it appears beneficial to keep horses in stable groups, weekly regroupings did not increase the risk of injury in young horses. Although the general level of agonistic interactions was low, some horses appeared to be particularly aggressive and individual characteristics and relationships between group members should be taken into consideration when horses are regrouped.

Kusunose et al., 1986: An experiment was carried out to examine the effects of the group size on the behavior and spacing pattern of pastured yearling horses. Thoroughbred yearling herds composed of one to twelve horses were pastured in fields of 2.4ha each for 7 hours a day. The route of locomotion and the grazing behavior were recorded continuously. Pictures were taken with four cameras at 15-minute intervals to measure the distances among individual horses.
The distance of locomotion was the longest (8000m to 15000m) when only one horse was pastured. With over three horses per herd they were nearly the same among herds (3000m to 6000m). The ratio of grazing time was the lowest (about 0.5) when only one horse was pastured in the field. The mean duration of grazing bouts (with the neck lowered) was prolonged linearly as the group-size increased up to four horses per herd. The mean distance among individuals increased from 5m (two horses per herd) to 30-50m (12 horses per herd), as the group-size increased. The mean distance to the nearest neighbor, however, was constant, irrespective of group-size. The distribution of distances among individuals was inclinded toward the left side when herds were composed of two to six horses each. The distribution was complex in a herd of 12 horses, as if it was combined with any other distribution.

Box grootte
Raabymagle & Ladewig, 2006: The results showed that the duration of sternal recumbency was significantly longer in the large boxes ((2.5 x height of the horse)²m²) than in the small boxes (1.5 x height of the horse)²m²) (P = .002). Furthermore, box size exerted an influence on the frequency of the rolling behavior shown before getting up, but box size was not the only factor affecting this behavior. The longer time spent in recumbency in the larger box could be interpreted as a sign of greater comfort for the horse (Belling, 1990; Houpt, 1980; Dallaire, 1986; Hale & Huggins, 1980). More time spent in recumbency probably means increased sleeping time as well. More sleep may improve conditions for animals, especially animals that are exposed to a high level of stress or training, such as horses used in sport competitions (Belling, 1990). Although the difference found in our study was statistically significant, it is questionable whether it is enough to have any welfare implications for the horses.

Ligcomfort
Ransom & Cade (2009): Grooming behavior occupies a relatively small but important part of the daily time budget of feral horses and is often observed as rolling.

Hansen et al., 2007: To analyse whether rolling behaviour was caused by individual housing in a box or whether it is a behaviour occurring also under free range conditions, we observed a group of 43 horses kept on pasture throughout the day and night. Of the 43 horses observed, the rising procedure was seen in 41 horses, and 25 of these horses (60.9%) performed the rolling behaviour at least once. A total of 135 rising episodes were observed, and 41 followed the performance of a rolling behaviour (30.4%). We conclude that the behaviour is a kind of comfort behaviour but that further studies are necessary to explain its function. It appears that the rolling behaviour is some kind of comfort behaviour. Stretching is a sign of well-being and possibly rolling is a variant of stretching. Rolling could be a way for the horses to decrease stiffness and thereby gain well-being and satisfaction because, like stretching, it is performed after sleeping and resting. Stretching is assumed to be a feedback from stiffness and the phenomenon is seen in response to a period of asymmetry in position just like when the horses have been resting in sternal recumbency (Fraser, 1989).

Matsui et al., 2009: We assessed whether rolling damage by grazing horses could be reduced by constructing areas assigned for rolling. A group of horses were enclosed in a paddock with and without rolling areas made of dry soil, sand, and straw. Their behavior was recorded for 1 week in the paddock without any treatment (control paddock). Then the horses were moved to another paddock with the rolling areas (rolling paddock). After a 3-week familiarization period, horses were observed for 1 week. In the rolling paddock, the frequency and time spent rolling were significantly greater in rolling areas than in nonrolling areas. Horses significantly preferred the soil rolling area than sand and straw ($P < .05$). Although rolling was considered the most relevant body care behavioral element, the effects of the substrate in rolling areas on other body care behavioral activities, such as mutual and self-grooming, also were investigated. The frequency and duration of mutual grooming and the duration of self-grooming decreased significantly in the rolling paddock compared with the control paddock ($P < .05$). Hence, offering a rolling area encourages horses to roll in these areas and keeps the pasture in good condition; therefore, grazing time can be increased, with less reliance on supplementary feed.

References

1. Belling TH. (1990) Sleep patterns in the horse. Equine Pract;12:22-7.
2. Benhajali, H., Richard-Yris, M.A., Ezzaouia, M., Charfi, F., Hausberger, M.,2009. Foraging opportunity: a crucial criterion for horse welfare? Animal 3, 1308–1312.
3. Brehme U., Rose S. (2007). Effect of different activity and space offers on the activity behavior of stallions. Agr Eng, 62, pp. 408–409
4. Christensen, J.W., Sondergaard, E., Thodberg, K., & Halekoh, U. (2011). Effects of repeated regrouping on horse behaviour and injuries. Applied Animal Behaviour Science, 133, 199-206.
5. Dallaire A. (1986). Rest behavior. Equine Pract;2:591-607.
6. Fraser, A.F., 1989. Pandiculation: the comparative phenomenon of systematic stretching. Appl. Anim. Behav. Sci. 23,263–267.
7. Frentzen F. (1994). Bewegungsaktivitäten und—verhalten in Abhängigkeit von Aufstallungsform und Fütterungsrhythmus unter besonderer Berücksichtigung unterschiedlich gestalteter Auslaufsysteme [The locomotion activity and behavior of horses depending on the system of stabling and feeding rhythm, and taking various loose runs into particular consideration] [PhD thesis] University of Veterinary Medicine, Hannover, Germany. Abstract.
8. Fureix C, Bourjade M, Henry S, Sankey C, Hausberger M (2012). Exploring aggression regulation in managed groups of horses Equus caballus. Applied Animal Behaviour Science, 138, Issues 3–4, 216–228
9. Hale LA, Huggins SE. (1980). The electroencephalogram of the normal “grade” pony in sleep and wakefulness. Comp Biochem Physiol 66:251-7.

10. Hansen, M.N., Estvan, J., & Ladewig, J. (2007). A note on resting behaviour in horses kept on pasture: Rolling prior to getting up. Applied Animal Behaviour Science, 105, 265-269.
11. Hartmann E, Søndergaard E, Keeling LJ (2012). Keeping horses in groups: A review. Applied Animal Behaviour Science, 36(2–4), 77–87.
12. Henderson, A.J.Z. (2007). Don't fence me in: managing psychological well being for elite performance horses. Journal of applied animal welfare science, 10(4), 309-329.
13. Hoffmann G., Bockisch F.J., Kreimeier P. (2009). Einfluss des Haltungssystems auf die Bewegungsaktivität und Stressbelastung bei Pferden in Auslaufhaltungssystemen [Influence of the husbandry system on the movement activity and stress exposure of horses in discharge husbandry systems] Landbauforschung-vTI Agr Forestry Res, 59, pp. 105–112
14. Houpt KA. (1980). Equine behavior. Equine Pract;2:8-17.
15. Jørgensen G.H.M., Bøe K.E. (2007). Individual paddock versus social enclosure for horses Horse behavior and welfare, EAAP publication, Wageningen, The Netherlands, pp. 79–83
16. Jorgensen, G.H.M., Borsheim, L., Mejdell, C.M., Sondergaard, E., Boe, K.E. (2009). Grouping horses according to gender—effects on aggression, spacing and injuries. Appl. Anim. Behav. Sci. 120, 94–99.
17. Kusunose, R., Hatekeyama, H., Ichikawa, F., Kubo, K., Kiguchi, A., Asai, Y., & Ito, K. (1986). Behavioral studies on yearling horses in field environments 2. Effects of the group size on the behavior of horses. Bull. Equine Res. Inst.; 23, 1-6.
18. Matsui, K., Khalil, A.M., & Takeda, K. (2009). Do horses prefer certain substrates for rolling in grazing pasture? Journal of Equine Veterinary Science, 29 (7), 590-594.
19. Raabymagle, P., & Ladewig, J. (2006). Lying behavior in horses in relation to box size. Journal of Equine Veterinary Science, Volume 26, Issue 1, Pages 11–17
20. Ransom & Cade (2009). Quantifying Equid Behavior - A research ethogram for free-roaming feral horses, U.S. Geological Survey Techniques and Methods 2-A9, 23 p.
21. Rose-Meierhöfer, S., Klaer, S., Ammon, C., Brunsch, R., & Hoffmann, G. (2010). Activity behavior of horses housed in different open barn systems. Journal of Equine Veterinary Science, 30 (11), 624-634.
22. Ruckebusch Y. (1975). The hypnogram as an index of adaption of farm animals to changes in their environment. Appl Anim Ethol;2:3-18.
23. Smith C. (1995). Sleep states and memory processes. Behav Brain Res;69:137-45.
24. Visser EK, Ellis AD, Van Reenen CG (2008). The effect of two different housing conditions on the welfare of young horses stabled for the first time. Applied Animal Behaviour Science, Volume 114, Issues 3–4, 521–533.
25. Zeitler-Feicht M. (2001). Handbuch Pferdeverhalten [Handbook horse behavior] Eugen-Ulmer-Verlag, Stuttgart, Germany.