

THE IMPORTANCE
OF SOCIAL RELATIONSHIPS

CHAPTER 8 IN HORSES

Summary

SUMMARY

Feral horses are social animals, which have adopted early predator detection and flight as their prime defence mechanisms. They rely on survival strategies centered on the formation of cohesive social bonds within their family or bachelor bands. Many problems in the husbandry of social animals in general, and of horses more in particular, are due to the fact that the limits of their (social) adaptive abilities are exceeded. Although it is likely that coping capacities of domestic horses have changed during domestication - as a result of selective breeding - in some aspects, evidence also suggests that the fundamental social characteristics of horses have remained relatively unchanged. Field studies in (semi)natural environments are an excellent way to study the social life of horses. They may provide the scientific knowledge necessary to elucidate the social needs of domestic horses kept under human supervision.

In this thesis, social structure, social strategies and social interactions are investigated in groups of Icelandic horses kept in captivity (the Netherlands) and in (semi)natural environments (Iceland). Thereby, it is investigated whether individual horses use interventions as an instrument to influence their social network. In the last field study two additional small groups of animals were introduced in a resident group, to investigate familiarity as a social variable. Finally, the importance of positive social interactions as an ethological need in domestic horses are evaluated. The results of this thesis provide science based arguments to predict the horse's possibility to cope with the social factors in modern husbandry systems (isolation or overcrowding) in order to improve optimal welfare of horses in captivity.

After a general introduction (**chapter 1**), a literature review is presented on sociality among feral horses and the role of social bonds in different feral equine social organisations (**chapter 2**) and the impact of sociality in captivity. During the last decades, the main use of horses changed from predominantly labour, to sports, leisure and pleasure. It is argued that types of interactions between humans and horses as well as husbandry practices reflect differences in the human approach towards horses: a) the co-operative approach and b) the human-dominance & equine-submission approach. Most management practices are driven by (dominant) human requirements and costs limitations, but often ignore basic equine needs. In modern horse husbandry systems there is a tendency towards either too little (confinement with physical social isolation) or too much social contact (overcrowding) which both can lead to chronic stress. In general, chronic stress can induce various forms of abnormal behaviour. It has been shown for instance, that up to 30% of horses in the western world suffer from abnormal behaviour related to various less optimal husbandry practices, or to human-horse (mis)communication. In this chapter, it is argued that increased social contact between horses may be essential in order to prevent the development of abnormal behaviours. Although dissatisfaction with the possibilities of social interaction, free locomotion and foraging behaviour has stimulated the design of group housing systems, competition for scarce resources (food, salt, water, resting places) may lead to unwanted side effects like increased aggression and displacement. It is concluded therefore, that knowledge on the social dynamics within these systems is needed and should be integrated

with knowledge on species-specific characteristics of social behaviour of horses in more natural environments.

In **chapter 3**, a study was designed to find a simple set of behaviours which reliably reflect dominance. Dominance relationships between individuals of a herd were analysed and special attention was paid to the position of a gelding within such a herd. Five relevant behaviours were distinguished which adequately describe dominance relationships. They include four offensive behaviours using the head and one submissive behaviour: avoidance. Avoidance behaviour appeared to be the most reliable single predictor of dominance-submission relationships. Aggression with the hind legs however, was used both offensively and defensively and appeared therefore, not suitable as a predictive parameter for dominance relations. On the basis of these five behaviours, a (nearly) linear dominance hierarchy could be described within the herd. The mares and geldings were interspersed in the rank order of the total group, with five mares ahead of the first gelding. The rank order position of the animals was significantly correlated with age and residency, but not with height. This means that the rank position of a horse was more likely the result of its social experience, than of strength or mass. For geldings the rank order was completely linear and correlated with the age at which they were castrated confirming the social experience theory.

In **chapter 4**, social relationships within a mare-gelding group of Icelandic horses were studied in Iceland, and possible relationships between preferred bonding and kinship relations were investigated. Because of the advantage of 24 hrs light in Iceland, we were in the unique position to study these relationships continuously. In addition to dominance relations (see chapter 3), special attention was paid to affiliative behaviours (allogrooming and play) and proximity relations in order to be able to describe preferred bonds. The results show that social structure in the domestic herd was dominated by affiliative behaviours. The horses preferred to bond within the same sex-age class and were also in close proximity of those 'friends'. Two subgroups, based on close affiliative and proximity relationships, could be distinguished: adult mares in one group, adult geldings, sub adult mares and geldings and yearlings in the other group (foals were not included in the analysis). Adult mares did not play at all, while sub-adult mares played significantly less than all male groups. The closer the adult mares were in rank, the more they also allogroomed each other. Kinship was related to all affiliative behaviours as well as proximity. It is speculated that the relative high allogrooming rates between adult mares (compared to feral horses), low aggression rates and the increased social interaction frequencies of sub adults are related to the absence of adult stallions.

It appears both from chapter 3 and chapter 4 that the role of adult mares in the domestic herd differs from that of adult geldings and sub-adult animals and foals (mares are more often high ranking and less opportunistic in their mutual relationships than geldings). In **chapter 5** different social roles of adult mares were analysed and related to differences in their reproductive state. Most adult mares foaled during the study, but each year also barren control mares were present. There were significant changes in the social behaviour and interactions of mares after foaling, both compared to their own behaviour pre-partum and

to that of barren control mares. Irrespective of the seasonal effect, allogrooming frequencies dropped significantly more in post partum mares compared to control mares. Individual differences in allogrooming frequencies were remarkably consistent across the non-consecutive study years, provided the mares were in the same reproductive state. Post partum mares and their foals, separated off in a distinct spatial subgroup. Familiarity appeared to be a more important factor than kinship in the selection of a preferred partner. Since in the study presented in chapter 4 no unfamiliar animals were present, the data in this study could not be partially calculated with a correction for either kinship or familiarity.

Finally the social dynamics of mare–gelding herds were assessed through the analysis of interventions (**chapter 6**). In this study, an intervention is defined as the behavioural action of one animal (the intervener) who actively interferes in an ongoing interaction between a dyad with the apparent aim of altering that interaction (verified by post-hoc analyses of disturbed and undisturbed interactions). Many interventions took place during dyadic affiliative interactions between two other horses. Interventions in allogrooming or play were performed significantly more often when at least one member of the initial interaction was a preferred partner of the intervener. The stronger the preferred association in allogrooming was between the intervener and members of the initial dyad, the higher the chance the intervener would displace one initial member and continue allogrooming with the other. Interveners from the smaller introduced groups (relative unfamiliar from the resident herd) intervened significantly more often when one of their group members allogroomed with an unfamiliar animal, possibly because it might be of high importance to safeguard reliable social relationships within the small introduced groups.

In **chapter 7** the main findings of **chapter 2-6** are evaluated, placed in a wider context and assessed in terms of the social needs of the horse. In addition, the implication of these results for equine welfare under husbandry conditions, is discussed. It is concluded that social life of domestic horses is dominated by preferred bonds which are established and maintained by allogrooming, play, proximity and dominance interactions. Individuals regulate their social network by means of interventions in interactions between other members of the herd, which in itself is complex.

To assess the implications of these findings for horse husbandry, several steps are taken. Firstly, it is argued that the execution of affiliative behaviours may be rewarding in itself. Secondly, it is investigated whether the execution of affiliative behaviour is not only self-rewarding but also whether it can be classified as an ‘ethological need’. ‘Ethological needs’ are behaviours which are so important for the animal that husbandry systems that lack the possibilities to execute such behaviours will cause chronic stress. Taken together, it is concluded that allogrooming as well as play satisfy the criteria for an ‘ethological need’.

Finally, the implications are discussed of the results obtained in chapter 2-6 combined with the outcome of the ‘ethological need discussion’ on modern western horse husbandry. It is concluded that all horses need physical social contact, but that horses, which lack appropriate social learning experiences during ontogeny, may be hampered in their social functioning later in life. Solutions for problems, including dominance problems, in individual social housing (chapter 7 figure 3) and group housing are presented.

In conclusion, domestic horses live in complex social organisations. Dominance relationships are related to social experience. Horses have consistent affiliative relationships in allogrooming, play and proximity and safeguard their own social network by means of interventions. Allogrooming and play can be considered as an 'ethological need' which can cause chronic stress when horses are deprived from the possibility to execute these behaviours. Thus, the performance of social interactions is a necessity for domestic horses which notion should be reflected in modern husbandry and management systems.







