Do stabled horses cope?

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Do stabled horses cope?

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While abnormal behaviour in intensively-managed animals causes concern in human onlookers, the consequences of these behaviours for the animals themselves are now being investigated.

Introduction

Horses are regarded as a familiar part of many agricultural idylls but their role as a farm animal has become questionable. If we compare the life of a stabled riding horse with that of other farm species, some differences are obvious. Unlike most cows, pigs, and sheep, horses are not kept with a view to productivity in terms of meat or milk production and therefore are often on limited food rations. Furthermore, horses are housed on their own while having especially close contact with Man. This is why they are more often these days described as a ‘companion animals species’. Unfortunately they do not fit very well into this category either, since they do not share living space with humans as do true companion animals like cats, dogs, and caged birds. Their contact with humans is largely restricted to being groomed, fed, and ridden. What is more, when we stable horses, we tend to limit their access to food and equine company. This can have important repercussions for their welfare.

Behaviour and welfare

Caged lions that repeatedly pace up and down their enclosures raise public concern about welfare in zoos. On a less exotic scale, similar behaviours are performed by horses and ponies throughout the country. Generally known in horse lore as ‘stable vices’ and given specific descriptive labels such as box-walking (pacing repeatedly around the stable), weaving (swaying from side to side on one spot), wind-sucking, and crib-biting (both repetitive oral behaviours), these seemingly irreversible behaviour changes tend to cause more embarrassment than concern. Despite this, questions regarding ‘stereotypies’, as these behaviours are more correctly described, have been fielded by behaviourists and vets for decades. The majority of equestrian authors tend to use the blanket term ‘boredom’ to explain how these behaviours arise, and the remainder imply that it is the fault of the horses themselves. However, the days of dismissive attitudes to behavioural anomalies in horses and ponies would appear to be numbered. Therefore, while there are still those who regard the ‘private life’ of their stabled horses as being unimportant as long as it does not cause poor performance, others have begun to question the merits of traditional stable management that gives rise to radical departures from the time-budgeting of wild horses.

Natural horse behaviour vs. stabled horse behaviour

Although the only true wild horses are in captive populations, we can use their behaviour and that of feral...
horses as guidelines for what could be regarded as normal equine behavioural organization. Of the major groups of behaviours, the one which occupies the bulk of any free-range horse is grazing. Indeed, the search for choice grazing spots and the ingestion of forage occupies up to 16 hours of the horse’s day. In the domestic situation, feeds are more concentrated to give performance horses readily digested energy resources. Foodstuffs are also dried to make them easier to store and handle. The increase in concentrated parts of the diet relative to feral menus is balanced by a reduction in fibrous components. At the same time, bulky foods which make a considerable contribution to gut-fill are avoided in racehorses, because they are thought to compromise lung-volume, and therefore, racing performance. As a result, the daily ration given to a stabled horse can be consumed rapidly, often in less than 3 hours.

Other factors that arise in intensively-managed horses include restricted space and reduced social contact. Whereas horses have evolved to be very sociable animals, many owners feel that their charges should be given solitary quarters to make bullying less likely and to generally facilitate grooming, feeding, and tacking-up.

Studies

Recent research at Bristol University’s veterinary school has aimed to determine the prevalence of abnormal equine behaviour in the UK, and to identify management factors associated with stereotypies. Further, it was designed to determine what, if any, physiological differences are associated with stereotypies and to examine the physiological and behavioural consequences that accompany attempts to prevent them.

The first approach was to develop an understanding of equine stereotypies by surveying a large group of Thoroughbred racehorses. These horses have finely honed pedigrees and are often described as being ‘highly-strung’, which is a reference to their heightened sensitivity to stimuli e.g. they are more easily startled than less finely bred individuals and have more ticklish skin. It is more accurate to describe these animals as being ‘more reactive’; something that one would expect in animals which have been bred to race from a standing start and therefore require a minimum of cues to tell them to run. It has been said that the more reactive the horse is, the more likely it is to show maladaptive behavioural responses to being stabled. Although this theory has not been tested in horses, evidence from studies of bank voles that became stereotypic in laboratory conditions suggests that it is well-grounded.

In the survey, trainers were asked to state how many horses, of each age-group, showed abnormal behaviour and then to answer 28 questions that defined the way in which they housed and fed their horses. Results involving 4468 horses in training showed the prevalence of stereotypies to be 10.8 per cent. This confirms the findings of smaller surveys in other countries and helps to underline the fact that these behavioural patterns are common.

Analysis of the data identified which husbandry factors were associated with peaks in the prevalence of abnormal behaviour in racehorses. These management factors included small amounts of daily forage (less than 6.8 kg) and stable-designs that limited the amount of communication that is possible between neighbouring horses. This association is somewhat predictable because one would expect horses to behave normally, if they have plenty of food and company. However, when interpreting the results of surveys, it is important not to arrive at cause-and-effect conclusions. For example, until long-term (longitudinal) studies, that include some form of intervention, demonstrate a fall in the prevalence of abnormal behaviour after the introduction of novel environmental restrictions, one cannot be certain that isolation stabling causes stereotypies. Although the surveys have shown a link, we have to bear in mind that the horses may have had the behaviours before they were ever stabled.

It is important to avoid jumping to conclusions from the results of a cross-sectional, rather than longitudinal, study. This is because one could erroneously attribute the effect to the incorrect cause, thus generating misinformation. For instance, because some horse owners believe that copying is a serious possibility, they isolate their stereotypic horses, in which case isolation would be a response to rather than a cause of stereotypic behaviour. However, as far as the food-ration findings are concerned, it seems unlikely that trainers would limit their horses’ forage-allowance because they detected a rise in the incidence of unwelcome behaviour (McGreevy et al., 1995a).

When they had also examined abnormal behaviour on Thoroughbred studs, the Bristol group had data on over 11 000 horses. Using these data, they were able to show that the prevalence of stereotypies rises with age. Therefore, it seems likely that few horses are ever ‘cured’ of these behaviours. This implies that once these behavioural anomalies are established, they persist despite attempts to improve any potentially causative deficiencies in the horses’ management. This process is known as behavioural ‘emancipation’ because the behaviours have become detached from their initiating causes. Furthermore, this implies that environmental enrichment programmes should be implemented prophylactically rather than therapeutically. A smaller study involving members of the British Horse Society showed that, in dressage and eventing horses, time spent in the stable was positively associated with peaks in prevalence of abnormal behaviour (McGreevy, French, and Nicol, 1995b).
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Figure 1 The young horse on the right is crib-biting (photo by courtesy of Caroline Bower).

X-rays

The stereotypy that trainers found most frustrating was crib-biting (figure 1), which was reported in 5.5 per cent of the racing Thoroughbred population. A crib-biting horse repeatedly seizes fixed objects with its incisor teeth and pulls back, while making a characteristic grunting noise thought to signify the passage of air into the digestive tract. This was the behaviour the group decided to concentrate on because it could be manipulated experimentally, and has been traditionally linked to various forms of ill-health including flatulence and a failure to maintain body weight. They began by radiographing horses as they performed the behaviour. The results of the study challenge the view that crib-biters actively ingest air, because there was no movement of the tongue as one would expect in true swallowing. Instead, each horse showed an explosive distension of the oesophagus which prompted no peristalsis (McGreevy et al., 1995c). Observations of crib-biting horses in this study revealed very little primary oesophageal peristalsis. Much of the air left the proximal oesophagus between crib-bites by returning through the cranial oesophageal sphincter into the pharynx. This may explain why tympanic colic (an occasional cause of abdominal pain that is associated with wind or flatulence) is not seen in all crib-biting horses.

What happens when we prevent stereotypies?

Having recruited 12 local crib-biters, the researchers were able to demonstrate that after horses have been prevented from crib-biting by wearing a tight collar (see figure 2, cribbing collars are designed to make crib-biting uncomfortable) for 24 hours they perform more of the stereotypy than they had before the day of prevention. This suggests that, when crib-biters are prevented from stereotyping, it seems likely that their motivation to perform the behaviour rises. Furthermore, this may explain why other short-term aversion methods, such as electric shock treatments and long-term approaches involving surgical removal of muscles and nerves, prove so unsuccessful. The motivation to crib-bite remains so high in many horses that they often devise new ways of sending air into their oesophagi and the grunting resumes.

Continuing to use crib-biters, the group considered what physiological differences may exist between stereotypers and normal horses. The body system most likely to be affected by oral activity seemed to be the digestive system. It was felt that differences in this system could be the key to the unthriftness (the jargon term used to describe horses that are underweight), which is reputed to accompany crib-biting. The Bristol scientists assessed total gut transit time with radiopaque polythene particles, which were developed for related studies in human subjects. Another human technique that the researchers have successfully adapted for equine use involves orally-administered sulphasalazine, which is broken down by microbial action in horses' large intestines to release sulphapyridine that can be measured in the plasma. The appearance of sulphapyridine in plasma...
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Figure 2  Horse wearing a proprietary cribbing collar (photo by courtesy of John Conibear).

can be used as an index of oro-caecal transit time.

These techniques showed that, in horses that were fed hay as part of their daily ration, crib-biting is related to a shorter oro-caecal transit time than normal horses. However, horses on ‘complete’ diets, i.e. with no forage component, showed a positive correlation between crib-biting and total gut transit time. This suggests that there is a triangular relationship between diet, gut activity, and crib-biting. It is even possible that horses choose to crib-bite after a concentrated meal in order to improve gut motility. During this part of the project, the researchers found that unthriftiness in crib-biters is not related to these changes in gut motility but may occur, if levels of nutrition are critical, because these horses expend energy performing the behaviour while spending less time resting and nourishing themselves.

The consequences of prevention of crib-biting were of interest because they help to clarify the possible function of stereotypies. It seemed likely that, as well as digestive changes, a stress response would accompany such a period of deprivation, especially since ethologists have suggested that stereotypies enable animals to generate their own pain-killing chemicals, called ‘endorphins’, in order to cope with unacceptable environments. Using projection-free loose-boxes that provided nothing for the horses to seize with their teeth, the researchers compared short-term deprivation of crib-biting with the temporary withdrawal of forage while withdrawing hourly blood samples.

Intriguingly, neither deprivation of crib-biting or of food was associated with a stress response. However, when the horses were deprived of both food and the opportunity to crib-bite, they showed a dramatic rise in the plasma stress response. The stress caused by the absence of both of these oral behaviours may indicate that crib-biting can replace feeding activity and vice versa. The link between foraging and crib-biting that was highlighted by this study helps to explain why restricted feeding is a management factor associated with an increase in abnormal behaviour in racehorses. Crib-biters deprived of food and crib-biting also showed a significant reduction in oro-caecal motility, implying that normal gut function in these animals depends on their being given ad libitum access to food and to suitable crib-biting substrates. Crib-biters deprived of the opportunity to stereotype, eat more than normal horses, suggesting that they have greater ‘oral needs’ (greater need to perform behaviours involving their mouths). Plasma cortisol levels in crib-biters were higher than normal horses under a variety of treatments. This suggests that they are particularly stress-susceptible.

Conclusion

Crib-biters may wear their teeth down and are thought to have a slight predisposition to tympanitic colic. Crib-biters’ guts apparently undergo relative stasis when deprived of food and the opportunity to crib-bite. This should be borne in mind when owners elect to use cribbing collars while also limiting hay. Because they seem to work by making the behaviour too uncomfortable to perform, cribbing collars are likely to cause greater stress response in fasting horses than the projectionless boxes used in the Bristol study. Higher baseline levels of cortisol found in crib-biters may relate to their being more reactive generally, and therefore more susceptible to the deleterious effects of sub-optimal environments.

Fundamentally, this work has helped to illustrate the link between the way in which we manage our equine companions and the abnormal behaviour patterns that some of them go on to show. With this information, we can begin to use the onset of abnormal behaviour as a tool to identify areas of intensive management that are too far removed from natural equine environments. Furthermore, owners who choose to prevent affected horses from performing stereotypies should bear in mind that they may be taking away the mechanism that some stabled horses use to cope with the limitations of intensive management.
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References

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