What causes stable vices or stereotypies?

Suzanne Millman, PhD

Horse owners frequently use the term “vices” to refer to anything that a horse does that we find to be undesirable. Some vices are normal behavioural responses, despite the fact that they are annoying. For example, a “barn sour” horse that is reluctant to leave the property or pasture is displaying normal social behaviour for a herd species; it is safer to hang out with your equine buddies. Other vices appear to be abnormal or pathological behaviour responses, such as wood chewing and eating bedding or manure. Unfortunately the term vices also holds implicit moral overtones (Vices & Virtues). Hence the horse is often labelled as a “bad” horse, negatively affecting how treatment is employed. I discourage use of the term in favour of “undesirable behaviour” and/or encourage use of more descriptive terminology (i.e.: wood chewing).

Stereotypic behaviour is the scientific term used for a specific category of undesirable behaviour and refers to behaviour patterns that are repetitive and unvarying in form and do not appear to serve a purpose or goal. Horse enthusiasts will likely recognize some of these strange behaviour patterns, such as crib-biting, wind-sucking, head nodding, weaving, tongue rolling, tongue chewing, etc. They are problematic for horse owners, since they can reduce performance, reduce the value of the horse, and can be destructive to both horse and stable. Stereotypies are also seen in other confined animals, such as bar-chewing by laboratory rodents and pacing by captive carnivores at zoos or circuses. A decent body of scientific literature is developing about stereotypies, but it is necessary to look across species to develop an understanding of the biological mechanisms underpinning these behaviour patterns.

In general, stereotypies are likely to develop when an animal’s behavioural needs are not being met. We usually do a good job providing for the nutritional and veterinary needs of our horses, but activities they evolved to perform are often taken for granted. In the wild, horses spend sixteen hours per day foraging- looking for food, manipulating food, selecting which items to eat and which to avoid. Since they evolved to live in a herd, social interactions are also high priority- determining the social order, maintaining relationships with individuals within the group through grooming, playing, relying on the vigilance of others, and just hanging out together. Even though horses are fed an adequate diet and are not in danger of predators, they are highly motivated to forage and socialize. When they do not have outlets for these behaviour patterns, stereotypic behaviour is more likely to develop.

Research has shown that horses are less likely to develop stereotypies (1) when they are provided with at least 6.8 kg of forage (hay) each day, (2) when they have opportunity to socialize with other horses in neighbouring stalls through windows or over partitions, (3) are bedded with straw. Interestingly, the amount or type of exercise that the horse receives does not seem to affect development of stereotypies, nor does the provision of “toys”. An exception is the “foodball” which dispenses food as the horse pushes it around the stall, satisfying motivation to forage. Oral stereotypies, such as cribbing, are associated with feeding of concentrate or grain. It appears that grain feeding affects gut

acidity and prevalence of gastric ulcers, both of which are correlated with cribbing behaviour.

The relationship between stress and stereotypic behaviour is not straightforward. Some researchers suggest that stereotypies develop as “coping mechanisms” when horses are unable to resolve conflict, such as desire to graze when no forage is available. However, measurements of stress, including plasma hormones such as cortisol, endorphins and heart rate, have been difficult to interpret. Some researcher found stress levels to be higher in animals performing stereotypies, some found them to be lower and some found no differences. To complicate the issue, stereotypies may initially develop during periods of stress or anxiety, but over time stereotypies become “hard-wired” activities that are separated from their original causes. In other words, a horse may originally develop weaving in response to social conflict when it is separated from its companions, but as it becomes older and the stereotypy is more firmly established in the horse’s behavioural repertoire, a weaving horse may show this behaviour even when social companions are present. It becomes a type of “default” behaviour that can be triggered by a number of factors, not just social isolation. It may also become harder to “turn off” this behaviour by distracting the horse with other activities. Some of you may have seen a cribber that standing in a pasture of lush grass, cribbing on the wood fence!

We are beginning to gain an understanding of how stereotypies develop. A recent prospective study that followed 225 Thoroughbreds and part-Thoroughbred young horses over four years showed that more than one-third of the horses displayed abnormal behaviour patterns. Cribbing was performed by 10% of the horses and tended to develop at 20 weeks of age, shortly after weaning. Weaving and box walking were less common (5% and 2% respectively) and developed later (60 weeks and 64 weeks respectively). One-third of the horses were wood chewing at 30 weeks of age. Although wood chewing is not necessarily a stereotypy, since this depends on how uniform and repetitive the patterns are, horses that develop cribbing almost always begin with wood chewing.

Stereotypies were more likely to develop in foals from socially dominant mares rather than low and middle rank mares. It is not clear if this represents a genetic effect or an effect of reactivity, stress or anxiety response. Importantly, weaning method was a significant risk factor for development of stereotypic behaviour. Foals that were weaned on pasture or in a paddock were less likely to develop stereotypies later than foals that were confined at weaning in a stall or barn. Opportunities for grazing during weaning appear to be beneficial. Weaning is a significant time of stress due to dramatic changes in diet and social environment (separation from primarily social companion and mediator in times of conflict with other horses in the herd). Research on weaning stress in beef cattle has shown that fence line weaning, where calf can see and interact with their dams in neighbouring pastures, is beneficial. Also, devices that prevent nursing while allowing foals to interact socially with their dams are worth exploring. Nose guards have been used successfully in beef calves for this purpose by Haley & Stookey at University of Saskatchewan.

Unfortunately we know less about treating stereotypies. Methods of physical restraint or pharmaceutical intervention are ethically questionable as these methods prevent the behaviour, but do not address underlying causes. Hence, they run the risk of increasing the anxiety and frustrating. Experimental evidence shows that use of a crib collar to prevent the behaviour causes motivation build up, since horses will display even more cribbing behaviour when the collar is removed than they did initially. In situations where stereotypies cause injury, restraint may be justified with the guidance of a qualified animal behaviour specialist who can assist in addressing the causal factors and mitigating the distress and anxiety produced by prevention.

Although there is a pervasive belief that stereotypies are learned or imitated by other horses, there is no evidence, direct or circumstantial, to support this belief. Environments that cause stereotypies to develop in one horse are likely to cause the behaviour in other horses in the same barn, since the underlying causes of foraging opportunities and restrictive stall designs affect all inhabitants. Experiments exploring whether horses can learn a task or can gain information about the location of a food source by watching the actions of a trained horse have indicated that social learning does not occur in horses, although other species such as primates, pigs and even chickens perform well in these experiments. It is important to emphasize that stereotypic behaviour is not contagious since this factor affects treatment (also see my comments about the term “vices” above). Horses displaying stereotypies are often unwelcome in boarding stables and are often relegated to a deserted corner of the barn, a location that is likely to exacerbate the problem.

If you wish to discuss this topic further, please contact me. Since I am developing a research project to explore effectiveness of treatment options for horses displaying stereotypies, I would be grateful for information about potential participant horses that perform stereotypies.

Kind regards,

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Suggested readings:

Cooper, J., McGreevy, P., 2002. Stereotypic behaviour in the stabled horse: causes, effects and prevention without compromising horse welfare. In: Waran, N., (Editor), *The Welfare of Horses*. Kluwer Academic Publishers, pp. 99-124.

Nicol, C.J., 1999. Understanding equine stereotypies. Equine Veterinary Journal, Supplement 28:20-25.

Waters, A.J., Nicol, C.J., French, N.P., 2002. Factors influencing the development of stereotypic and redirected behaviours in young horses: findings of a four year prospective epidemiological study. Equine Veterinary Journal 34:572-579.