The Effective Control and Prevention of Crib-biting in intensively managed Horses

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Word Count: 969

Introduction

Crib-biting and wind-sucking are the most detrimental stereotypic behaviours in intensively managed horses (Nagy *et al*., 2009; McCall *et al*., 2009; Parker *et al*., 2009). Once established, crib-biting is difficult to stop but can be inhibited by the use of a collar or by surgery (modified Forssell's procedure) (Nagy *et al*., 2009).

Horses may develop such behaviours as a strategy to cope with acid build-up in the hindgut (Freire *et al*., 2009). Acid build-up is caused by fermentative acidosis during digestion (Freire *et al.*, 2009). Because horses may be attempting to limit acid build-up and preventing this behaviour may cause increased stress (Nagy *et al*., 2009; Freire *et al*., 2009), prevention of crib-biting is an important welfare issue for intensively managed horses.

Ad libitum feeding effectively reduces crib-biting but it is not feasible for intensively managed horses (McCall *et al.,* 2009). Research into different amounts of dietary grain and frequency of feeding are essential for developing a method of reducing diet-associated stress (Freire *et al*., 2009; McCall *et al*., 2009).

Discussion

Nagy *et al*. (2009) studied the effect of a feeding stress test on crib-biting horses. The stress test consisted of placing feed in front of the horses, but out of reach; titbits were given three times during the test period. The experiment involved 40 horses: control (n=9), crib-biters (n=10), collared crib-biters (n=10) and surgically treated horses (n=11). The horses were stress-tested once in the clinic and heart-rate variability was monitored. Behaviour was observed in their own stables, to maintain a familiar and comfortable environment.

The stress test triggered crib-biting in all crib-biting horses and some collared and surgically treated horses (Nagy *et al.,* 2009). Oral activities were significantly higher in crib-biting horses and increased in collared and surgically treated horses (Nagy *et al*., 2009). There was no significant difference in heart-rate variability. The results suggest that cribbing may not be associated with stress, but indicates that cribbing is more probably associated with the action of food delivery. This supports the ideas presented by McCall *et al*. (2009).

Single exposure to the stress test is a major limitation, as coping strategies are defined as a consistent reaction over time (Nagy *et al*., 2009). Another limitation was the inability to test the effectiveness of collars or surgery. Horses arrived at the clinic collared and the frequency of crib-biting increased significantly after collar removal, suggesting post-inhibitory rebound (Nagy *et al*., 2009; McGreevy & Nicol, 1998). A period of acclimatisation to the clinical environment would be more effective in establishing baseline behaviour and, therefore, increasing the accuracy of the test.

McCall *et al*. (2009) studied the effect of hourly feeds of concentrated diet on crib-biting horses. The treatment groups consisted of frequently fed horses receiving 0.19 kg of concentrate hourly (n=5) and a control group (n=5) fed twice daily. Food was delivered by a specialised automatic system. Number of crib-bites and cribbing-bout durations were recorded at 30 and 60 days. At 30 days, a greater number of crib-bites and longer bouts of cribbing were recorded for the frequently fed horses than for the control group (McCall *et al*., 2009). However, at 60 days there were no significant differences between the two groups (McCall *et al*., 2009). The results indicate that feeding more frequently does not decrease cribbing behaviour and suggests that the amount of feed may be more important in controlling cribbing in mature horses (McCall *et al*., 2009).

Environmental change and the specialised feed-delivery system may have affected the results (McCall *et al*., 2009). Cribbing arousal was associated with food delivery, hence the regular hourly deliveries by a novel method may have contributed to the initial increased activity (McCall *et al*., 2009). This may explain why at 60 days, significant differences ceased, since delivery had become less arousing (McCall *et al.*, 2009). Once again, longer adjustment periods would be beneficial in establishing baseline behaviours and eliminating confounding environmental factors.

Freire *et al*. (2009) investigated the effects of different amounts of dietary grain on feed digestibility and the behaviour of intensively managed horses. Five parameters were studied: oro-caecal transit time (OCTT), heart rate, digestibility, plasma cortisol concentrations and behaviour. The sampling groups were cribbers (n=6), weavers (n=5) and control horses (n=6). Two grain diets were tested: moderate-grain (35%) and high-grain (50%). Horses were fed each diet for 8 weeks.

High-grain diets reduced explorative behaviour but did not affect stereotypic behaviour (Freire *et al*., 2009). High-grain diets were also consumed over a longer period than moderate-grain diets, which is consistent with a previous study by Clegg *et al*. (2008). This may be an adaptation to reduce the delivery time of starch into the hindgut (Freire *et al*., 2009; Clegg *et al*., 2008). There was no significant difference for any of the physiological parameters. The results support the proposition that horses change their feeding habits to cope with low-forage or high-grain diets (Freire *et al*., 2009; Hothersall & Nicol, 2009).

The major limitation of the study is the relatively low difference in grain concentration between the two diets (Freire *et al*., 2009). It would advantageous to repeat the experiment, using a high-grain diet and a roughage-only, fat-based diet or processed-grain diet (Freire *et al*., 2009). Processed grain has undergone some starch breakdown and so may improve starch digestibility and, in turn, reduce excessive fermentative acidosis (Freire *et al*., 2009).

Conclusion

Preventing crib-biting in intensively managed horses is an important animal welfare issue (Nagy *et al*., 2009). If crib-biting truly is a stress-coping strategy, it would be best to prevent the establishment of, or the need for, crib-biting. As acid build-up due to fermentative acidosis may trigger the development of crib-biting, further research into the ideal concentrate grain diet or the use of processed feeds would be beneficial in achieving this goal.

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