

Management of horses showing stereotypic behaviour, owner perception and the implications for welfare

S. D. McBRIDE, L. LONG

A telephone survey was conducted of 100 racing stables, 100 riding schools and 100 competition establishments (8427 horses in total) to determine what management practices were being applied to horses showing stereotypic behaviour, and to determine the underlying reasons for them by assessing the perceptions and opinions of the people working with the horses. The results indicated that horse owners are concerned about stereotypic behaviour, first, because it reduces the performance of the animal (31, 30 and 27 per cent of the owners of racing stables, riding schools and competition establishments respectively), secondly, because it has adverse clinical effects on the horse (52, 55 and 56 per cent), and thirdly, because it reduces the monetary value of the animal (45, 59 and 31 per cent). The belief that these behaviours are learnt or copied also affects the management of affected horses: they are not allowed on to the premises by 4, 32 and 17 per cent of owners of racing stables, riding schools and competition establishments, respectively; attempts are made to remove the causal factors of the stereotypy by 35, 43 and 36 per cent; the behaviours are physically prevented by 77, 67 and 79 per cent, and the affected horses are kept separate from other horses by 39, 30 and 48 per cent.

QUESTIONNAIRE-BASED studies on stereotypic behaviours in horses have focused largely on the overall incidence and management practices associated with them. The most recent studies have reported the incidence of weaving, crib-biting and box-walking among horses in the UK as 9.4, 7.5 and 3.8 per cent, respectively, among dressage horses; 9.5, 8.3 and 3.6 per cent among event horses; and 3.9, 3.1 and 5.5 per cent among endurance horses (McGreevy and others 1995b).

Additional information may, however, be gained by using questionnaire-based studies on specific welfare issues. The misconceptions of horse owners derived from anecdotal evidence about the causes and effects of stereotypic behaviour have resulted in specific management practices being imposed upon the affected animals, practices which may potentially be detrimental to their wellbeing. For example, the isolation of a horse in an attempt to manage a stereotypy is known to elicit a stress response (Alexander and others 1988, Bagshaw and others 1994) and more recently it has been demonstrated that devices such as crib-straps and anti-weave bars, used to prevent crib-biting and weaving, also elicit a stress response (McBride and Cuddeford 2001). The aims of this study were first, to find out what management practices are being imposed upon horses showing stereotypic behaviour, and secondly, to determine the underlying reasons for these practices by assessing the perceptions and opinions of the people working with them.

MATERIALS AND METHODS

Study design

A telephone survey was conducted of 100 racing stables (flat and National Hunt), 100 riding schools and 100 competition establishments (show jumping, dressage and eventing) selected randomly from the British Equine Directory (1996/97). The stereotypies were defined as crib-biting/wind-sucking, weaving, and box-walking, and the respondents were first asked to confirm that they could clearly identify these behaviours. They were then asked the following questions:

- (1) How many horses are kept on the establishment and how many are considered to perform stereotypic behaviour?
- (2) Are horses that perform stereotypic behaviour permitted onto the premises?

(3) Are horses that perform stereotypic behaviour physically prevented from doing so by the use of crib-straps, anti-weave bars or by any other means?

(4) Are horses that perform stereotypic behaviour kept separately, with no visual contact with other horses?

(5) (a) Have any management changes been made since the onset of the stereotypic behaviour in an attempt to reduce it?

(b) Have these changes been successful?

(6) Do you believe that stereotypic behaviour is learnt from other horses?

(7) Do you believe that stereotypic behaviour is inherited?

(8) Do you believe that stereotypic behaviour reduces the performance level of the animal?

(9) Do you believe that stereotypic behaviour is detrimental to the horse itself?

(10) Do you believe that stereotypic behaviour reduces the value of the horse and, if so, by approximately how much?

Data analysis

The null hypothesis that the prevalence of each response was independent of discipline (racing stables, riding schools and competition establishments) was tested by using chi-squared analysis (Genstat for Windows 4.1; Lawes Agricultural Trust).

RESULTS

The 300 managers interviewed were responsible for a total of 8427 horses, of which 3454 were racehorses, 3037 were from riding schools and 1936 were from competition yards. Of the 100 establishments in each discipline, 80 of the racing stables, 58 of the riding schools and 55 of the competition yards had at least one stereotypy-performing animal. The prevalences of weaving, crib-biting and box-walking were 2.5, 3.7 and 1.1 per cent, respectively, among the racehorses; 2.1, 1.5 and 0.3 per cent among the riding school horses; and 3.9, 2.5 and 0.5 per cent among the competition horses (Table 1). Chi-squared analysis indicated that these prevalences were not independent of discipline ($P=0.002$), that is, the type of establishment had an effect on the number of horses performing stereotypic behaviour.

The answers received to questions 2 to 10 are presented in Tables 1 to 4.

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PAPERS & ARTICLES

TABLE 1: Answers given by respondents from 100 racing stables, 100 riding schools and 100 competition establishments to questions 2, 3 and 4

| Question | Racing stable | | Riding school | | Competition | |
|---|---------------|----|---------------|----|-------------|----|
| | Yes | No | Yes | No | Yes | No |
| (2) Are horses that perform stereotypic behaviour permitted onto the premises? | 96 | 4 | 68 | 32 | 83 | 17 |
| (3) Are horses that perform stereotypic behaviour physically prevented from doing so with the use of crib-straps, anti-weave bars or by any other means? (percentage of establishments keeping stereotypic animals) | 77 | 23 | 67 | 33 | 79 | 21 |
| Means of prevention (percentage of establishments restricting stereotypic behaviour) | | | | | | |
| Crib-strap | 63.5 | | 56.5 | | 54.9 | |
| Anti-weave bar | 68.9 | | 71.7 | | 74.6 | |
| Hanging a brick/bottle in the doorway (weaving) | 2.7 | | 4.3 | | 2.8 | |
| Tie up box-walkers | 1.4 | | 0 | | 1.4 | |
| Place bales in stables to prevent box-walking | 0 | | 0 | | 1.4 | |
| Remove crib-biting surfaces or paint surfaces with distasteful substance | 12.2 | | 2.2 | | 1.4 | |
| Use electric wire in stable to prevent crib-biting | 5.4 | | 0 | | 0 | |
| (4) Are horses that perform stereotypic behaviour kept separately from other horses? (percentage of establishments keeping stereotypic animals) | 39 | 61 | 30 | 70 | 48 | 52 |

DISCUSSION

The recalculated prevalence values (taking into account premises that refused horses showing stereotypic behaviour) for weaving, crib-biting and box-walking were 2.6, 3.8 and 1.2 per cent, respectively, among the racehorses; 3.2, 2.1 and 0.4 per cent among the riding school horses; and 4.7, 3.0 and 0.6 per cent among the competition horses. The values for the competition establishments were lower than those previously reported for the UK, which for weaving, crib-biting and box-walking were 9.5, 8.3 and 3.6 per cent, respectively (eventing), and 9.4, 7.5 and 3.8 per cent (dressage) (McGreevy and others 1995b) but comparable with the values previously recorded for racehorses: 2.8, 4.2 and 1.1 per cent in 1033 horses (Prince 1987); 4.0, 4.0 and 1.7 per cent in 2946 horses (McGreevy and others 1995a); and 5.0, 2.8 and 1.5 per cent in 644 horses (Redbo and others 1998).

The highly significant ($P<0.001$) difference between groups refusing affected horses on to the premises (question 2: 4, 32 and 17 per cent for the racing stables, riding schools and competition establishments, respectively) could be interpreted as due to differences between the purposes for which the horses are kept on the different establishments, for example, the racehorse trainers may consider the performance of the animal more important than the presence of stereotypic behaviour. However, at least as many of the racehorse trainers considered that a stereotypy would reduce the performance of a horse as did members of the other two groups (31,

30 and 27 per cent for the racing stables, riding stables and competition establishments, respectively) suggesting that other factors must be involved. In this respect, more riding schools believed that stereotypic behaviour was learnt and that the monetary value of affected animals was reduced, than did the other two groups. These beliefs by riding school owners could have been responsible for the greater refusal rate of affected animals on to their premises (Table 1).

Seventy-four per cent of all the establishments actively attempted to prevent stereotypic behaviour (Table 1) with devices such as the crib-strap and anti-weave bar. Although the function of stereotypic behaviour is unclear (McGreevy and Nicol 1998a, McBride and Cuddeford 2001), there is evidence that it may allow the animal to reduce stress and 'cope' with its environment (Lebelt and others 1998). Preventing the behaviour might therefore block this coping mechanism, thereby placing the animal in state of continual stress and having detrimental effects on its welfare. Even if the 'coping hypothesis' of stereotypy is incorrect, it has recently been shown that the use of the crib-strap and anti-weave bar induces a stress response in horses (McBride and Cuddeford 2001), so that the use of these devices is still potentially detrimental. Similarly, increasing a horse's confinement, either by hanging bricks or bottles in the doorway to prevent weaving, or by tying up box-walkers, or by placing bales in stables to prevent box-walking or by using electric wire to prevent crib-biting (Table 1) are all techniques which potentially reduce the quality of the horse's environment.

TABLE 2: Answers given by respondents from 100 racing stables, 100 riding schools and 100 competition establishments to questions 5a and 5b

| Question | Racing stable | | Riding school | | Competition | |
|---|---------------|------------|---------------|--------|-------------|----|
| | Yes | No | Yes | No | Yes | No |
| (5a) Have any management changes been made since the onset of the stereotypic behaviour? (percentage of establishments keeping stereotypic animals) | 35 | 65 | 43 | 57 | 36 | 64 |
| (5b) Have these changes in management been successful? (percentage of all establishments where management changes were made) | | | | | | |
| Methods | Tried | Successful | Unsuccessful | Unsure | | |
| Reduce the time spent stabled/increase turnout time | 49.3 | 37.0 | 8.2 | 4.1 | | |
| Provide toys in the stable | 12.3 | 5.5 | 6.8 | 0 | | |
| Increase exercise | 1.4 | 1.4 | 0 | 0 | | |
| Change the horse's stable regularly | 9.6 | 6.8 | 1.4 | 1.4 | | |
| Provide social contact for the horse including placing a companion animal in the stable | 9.6 | 6.8 | 2.7 | 0 | | |
| Exercise horse first when exercising a group of horses | 5.5 | 5.5 | 0 | 0 | | |
| Feed horse first when feeding all horses | 4.1 | 4.1 | 0 | 0 | | |
| Increase the amount of hay available in the stable | 6.8 | 4.1 | 2.7 | 0 | | |
| Place the horse in a box with views of a more animated environment | 2.7 | 1.4 | 0 | 1.4 | | |
| Use a chain across the doorway instead of closing the door | 1.4 | 1.4 | 0 | 0 | | |
| Increase the size of the stable | 5.5 | 2.7 | 1.4 | 1.4 | | |

TABLE 3: Answers given by respondents from 100 racing stables, 100 riding schools and 100 competition establishments to questions 6 and 7

| Question | Racing stable | | | Riding school | | | Competition | | |
|--|---------------|----|--------|---------------|----|--------|-------------|----|--------|
| | Yes | No | Unsure | Yes | No | Unsure | Yes | No | Unsure |
| (6) Do you believe that stereotypic behaviour is learnt from other horses? | 48 | 32 | 20 | 52 | 39 | 9 | 37 | 31 | 32 |
| | | | | P=0.002 | | | | | |
| (7) Do you believe that stereotypic behaviour is inherited? | 29 | 45 | 26 | 23 | 56 | 21 | 23 | 47 | 30 |
| | | | | P=0.415 | | | | | |
| Other reasons given for the development of stereotypic behaviour | | | | | | | | | |
| Boredom | 20.0 | | | 28.6 | | | 25.5 | | |
| Mismanagement/confinement | 0 | | | 5.4 | | | 14.9 | | |
| Stress | 4.4 | | | 8.9 | | | 6.4 | | |
| Habit | 6.7 | | | 0 | | | 2.1 | | |
| Temperament/nervous disposition | 15.5 | | | 23.2 | | | 14.9 | | |
| Foals copy dam | 13.3 | | | 0 | | | 4.3 | | |

The number of establishments that separated the affected horses from other horses is of similar concern (question 4) because social isolation has also been reported to induce a stress response in horses (Alexander and others 1988, Bagshaw and others 1994). Given that stress is one putative causal factor for the induction of stereotypic behaviour (Ladewig and others 1993), such management practices would serve only to reinforce the behaviour.

Question 5 considered the management changes introduced to remove the potential causes of stereotypic behaviour and the perception of the horse owner on how these changes affected the stereotypy. The most frequent change in management was increased turnout time (49.3 per cent), which was reported to have a high success rate (75 per cent). Increasing turnout time increases a horse's contact with other horses, the time it spends eating and potentially provides it with a more stimulating environment, factors that have previously been correlated with a low incidence of stereotypies (McGreevy and others 1995a, Redbo and others 1998) and shown to reduce weaving significantly (Cooper and others 2000). The high success rate reported for providing toys in the stable (45 per cent), increasing exercise (100 per cent), changing the horse's stable (71 per cent), increasing the amount of hay available in the stable (60 per cent) and providing social contact for the horse, including placing a companion animal in the stable (71 per cent), can also be explained in these terms. Exercising or feeding an affected animal first when exercising or feeding a group of horses was also reported to

be a successful way to reduce stereotypic behaviour. These findings support the idea that stereotypies result from the frustration of highly motivated behaviours (Rushen and others 1993), for example, when exercise or food are anticipated by environmental cues in advance of the events themselves. Removing the anticipation and frustration by exercising and feeding the animal first may thus reduce the stereotypic behaviour.

Forty-eight, 52 and 37 per cent of the owners of racing stables, riding schools and competition establishments, respectively, believed that stereotypic behaviour was learnt from other horses, whereas only 29, 23 and 23 per cent believed it to be inherited (Table 3). Although there is evidence that genotypic predisposition is a major factor in the development of stereotypies (Cabib and others 1998), the long gestation period and the expense of horse breeding limit the chance of horse owners becoming aware of any genetic effect. More of the racing establishments considered stereotypies to be genotype-dependent than the other two groups (29 v 23 and 23 per cent, respectively), possibly because they may be involved in more extensive breeding programmes over several generations. This difference may also explain why more of the racing stables than the other two groups reported seeing dams and foals performing stereotypic behaviour together (13.3 v 0 and 4.3 per cent, respectively).

Nearly one-third of all the establishments believed that stereotypic behaviour reduced the performance of the animal (31, 30 and 27 per cent of the racing stables, riding schools

TABLE 4: Answers given by respondents from 100 racing stables, 100 riding schools and 100 competition establishments to questions 8, 9 and 10

| Question | Racing stable | | | Riding school | | | Competition | | |
|--|---------------|----|--------|---------------|----|--------|-------------|----|--------|
| | Yes | No | Unsure | Yes | No | Unsure | Yes | No | Unsure |
| (8) Do you believe that stereotypic behaviour reduces the performance level of the animal? | 31 | 64 | 5 | 30 | 68 | 2 | 27 | 58 | 15 |
| | | | | P=0.008 | | | | | |
| (9) Do you believe that stereotypic behaviour is detrimental to the horse itself? | 52 | 48 | 0 | 55 | 34 | 11 | 56 | 37 | 7 |
| | | | | P=0.01 | | | | | |
| (10) Do you believe that stereotypic behaviour reduces the value of the horse and if so by approximately how much? | 45 | 17 | 38* | 59 | 21 | 20* | 31 | 15 | 54* |
| Percentage reductions† | | | | P<0.001 | | | | | |
| 1-10 | 3 | | | 5 | | | 2 | | |
| 11-20 | 7 | | | 4 | | | 4 | | |
| 21-30 | 5 | | | 15 | | | 6 | | |
| 31-40 | 3 | | | 2 | | | 0 | | |
| 41-50 | 8 | | | 11 | | | 8 | | |
| 51-60 | 1 | | | 0 | | | 1 | | |
| 61-60 | 0 | | | 0 | | | 0 | | |
| 71-80 | 0 | | | 2 | | | 0 | | |
| 81-90 | 1 | | | 0 | | | 0 | | |
| 91-100 | 1 | | | 7 | | | 0 | | |
| Mean reduction | 38*† | | | 45*† | | | 35*† | | |

* Depends on the severity of the condition and the ability of the animal

† Numbers reflect only those individuals able to give estimates; others stated that there was a reduction but could not say by how much

and competition establishments, respectively) and over half considered them to be detrimental to the horse itself (52, 55 and 56 per cent of the racing stables, riding schools and competition establishments, respectively). However, the anecdotal evidence linking crib-biting with colic (Frauenfelder 1981, Sambraus 1985, Fraser and Broom 1990), has to some extent been disproved (McGreevy and others 1995c) and although crib-biting wears the incisor teeth and may lead to increased energy expenditure (McGreevy and Nicol 1998b) or loss of condition (Sambraus 1985, Dodman and others 1987), the overall clinical effects of crib-biting are often negligible. Similarly, weaving and box-walking have been reported to lead to a loss of condition (Houpt 1986, Fraser and Broom 1990) and strained ligaments (Ralston 1982), but these behaviours have relatively minor effects compared with other clinical conditions. It appears to be partly this misconception about the clinical effects of stereotypic behaviours, together with the belief that they are learnt, that leads owners to introduce management changes to try to eliminate them. In addition, 45, 59 and 31 per cent of racing stables, riding schools and competition establishments, respectively, believed that the monetary value of the animal was reduced by 35 to 45 per cent, higher percentages than believed that stereotypies reduced the animal's performance (on average 45 v 29 per cent) suggesting that other factors may influence the selling price of the animal. The discrepancy was greatest for riding schools where the stigma associated with owning a 'vice-ridden' animal is perhaps greater because these establishments are more exposed to the general public. This element of social unacceptability associated with owning an affected horse may play an important role in determining its management.

To improve the welfare of horses with stereotypic behaviour, their owners need to make management changes in response to the causal factors (McGreevy and others 1995a, Redbo and others 1998, Cooper and others 2000) rather than changes designed to prevent the overt signs of the behaviour. Further research is needed to determine the importance of learning versus inheritance in the development of stereotypic behaviour so that affected horses need no longer be banned or ostracised from racing stables, riding schools and other establishments.

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ABSTRACT

Detection by PCR of bovine papilloma virus DNA in equine sarcoids

A POLYMERASE chain reaction (PCR) technique was applied to swabs and scrapings taken from 92 equine sarcoids and 20 non-sarcoidal lesions, to determine whether the DNA of bovine papilloma virus (BPV) could be detected. A first primer set was used to check whether DNA had been extracted, and a second primer set was specific for BPV-DNA. DNA was isolated from 88 per cent of the swabs and 93 per cent of the scrapings, and BPV-DNA was detected in 88 per cent and 91 per cent of the successful swabs and scrapings, respectively. All the control lesions were negative for BPV-DNA. The technique was significantly less sensitive than clinical diagnosis and is unsuitable for occult sarcoids. However, BPV-DNA was detected in all sarcoids with an ulcerated surface, and the technique may be useful for detecting sarcoids in wounds and for detecting their recurrence after they have been removed.

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