The Old School, Brewhouse Hill, Wheathampstead,
Hertfordshire AL4 8AN, UK
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The day-to-day management of UK leisure horses and the prevalence of owner-reported stable-related and handling behaviour problems

J Hockenhull*†‡ and E Creighton‡§

† School of Veterinary Sciences, University of Bristol, Langford House, Langford, Bristol BS40 5DU, UK
‡ Department of Biological Sciences, University of Chester, Parkgate Road, Chester CH1 4BJ, UK
§ School of Agriculture, Food and Rural Development, Newcastle University, Newcastle upon Tyne NE1 7RU, UK
* Contact for correspondence and requests for reprints: Jo.Hockenhull@bristol.ac.uk

Abstract

While concerns regarding the day-to-day management of domestic horses have been raised in relation to behaviour problems and welfare, most published studies have focused on the management of performance horses and less is known about the routine management of leisure horses and the prevalence of behavioural problems within this population. The objective of this study was to generate data on the day-to-day management of UK leisure horses and to quantify the prevalence of stable/stall-related and handling behaviour problems. A self-administered internet survey was used to collect individual horse-level data from a convenience sample of leisure horse owners. The survey was online for a year and respondents were asked to report on their routine over the previous week to minimise recall bias. The survey covered the horses' stable and turn-out routine and environments, including opportunities for social contact with other horses. Respondents were also asked to rate the frequency their horse displayed 20 stable-related and handling behaviour problems. Data on 1,850 individual horses were collected. Stable-related and handling behaviour problems were displayed by 82% of horses sampled. The findings suggest a trend towards year-round stabling. The restriction in turn-out opportunities may have welfare costs for the horses involved. The high prevalence of stable-related and handling problems, including stereotypies, is a concern.

Keywords: *animal welfare, behaviour problems, horse, husbandry, management, survey*

Introduction

Inappropriate housing and management have been associated with equine health and behavioural problems (Ödberg & Bouissou 1999; Hotchkiss *et al* 2007a) and may have wider implications for training, performance and the horse-human relationship (Hausberger *et al* 2008). There is little information about the type and variety of management procedures currently being employed for domestic horses in practice at ground level in everyday husbandry situations (Harris 1999; Hotchkiss *et al* 2007a). Survey-based studies, for example, Mellor *et al* (2001), Hotchkiss *et al* (2007a) and Ireland *et al* (2011), have generated some baseline data on the housing and management of UK leisure horses, but have tended to focus on the horse's general husbandry regime rather than the specifics of their stabling and turn-out environments, including their opportunities for social contact.

Social and physical inadequacies of some domestic management systems have been identified as likely causes of heightened aggression and undesirable reactions to humans (Kiley-Worthington 1997; Zeitler-Feicht 2004; Hausberger *et al* 2008). Stereotypic behaviour problems may also be expressed and have been the focus of most scientific studies exploring abnormal equine behaviour to date (eg McGreevy *et al* 1995a,b; Bachmann *et al* 2003; Christie *et al* 2006). But the behavioural problems of greatest concern to leisure horse owners are likely to be those that directly affect their day-to-day interactions with their horse, and therefore these problems warrant further investigation. Furthermore, the tendency for established stereotypies to become emancipated from their original cause can limit their use as indicators of current welfare status (Mason & Latham 2004). Consequently, non-stereotypic behaviours may also provide a more accurate indication of a horse's welfare state as regards its current environment and husbandry routine.

Traditional management regimes are widely employed by owners without questioning their impact on the horse. To see any improvements in the welfare of domestic horses these long-held beliefs and practices need to be challenged (Goodwin 1999; Nicol 1999). To do this we need to understand just how leisure horses are being managed and the prevalence of behavioural problems within this population.

This paper quantifies the day-to-day management practices and prevalence of owner-reported behavioural problems in the stable/stall (hereafter termed stable-related) and when handling in a representative sample of UK leisure horses.

Materials and methods

The survey

This survey was conducted as part of a series of three surveys exploring the husbandry and welfare of UK leisure horses (Hockenhull 2010). The surveys covered management practices (results reported here), diet and feeding regime, and ridden work and equipment. The findings of the latter two surveys are reported elsewhere (Hockenhull & Creighton 2012, 2013, 2014a).

The survey included eighteen questions on the horse's day-to-day management routine covering its stable/stall and turn-out environment, opportunities for social contact with other horses, number of regular carers, time carers spent with the horse per day, and the length of time the horse had lived at its current yard. Respondents were asked to rate the frequency the horse performed eleven stable-related behavioural problems (bed eating, excessive drinking, wood-chewing, crib-biting, repetitive licking, box-walking/pacing/circling, weaving, aggression to horses, aggression to people, biting/kicking itself, chewing/tearing rugs); and nine handling behavioural problems (pull faces when people pass/approach the stable/stall, turn away when people enter the stable/stall, try to bite/kick people entering the stable/stall, pull faces/fidget when groomed, rugged or tacked up, try to bite/kick when groomed, rugged/blanketed or tacked up). The behavioural problems chosen were identified from the problem pages of popular UK equestrian publications. The terminology used in the survey was the same as that included in these magazines to facilitate the participants' understanding of the survey questions. 'Pulling faces' in varying contexts was a commonly reported concern and encompassed behaviours including the horse putting its ears back, baring teeth and threatening to bite.

The behaviours were presented in two matrix questions using a 1–5 scale anchored at the endpoints (1 = never, 5 = often), the meaning of which was not defined for our survey participants. Pilot testing revealed that respondents felt more comfortable rating their horse's behaviour and being able to explain the circumstances than committing to a definitive behaviour present/absent binary question. A not applicable option was provided to prevent non-response if the horse had not had the opportunity to express the behaviour. The survey was online for a full calendar year (2006–2007) to help account for any seasonal variation.

Survey sample

Data were generated from a convenience sample of UK leisure horse owners. Recruitment was ongoing throughout the year and online and offline strategies were employed to maximise the likelihood that the sample obtained would be representative of the wider leisure horse population. Online strategies included invitations in internet discussion forums, links from equestrian websites and emails to riding clubs. Offline strategies included notices in local press and equestrian magazines, mailshots (comprising of letters containing information on the surveys inviting participation) were sent to livery yards, and leaflet distribution.

Demographic data on both the respondents and their horses were comparable to other data sources, including the National Equine Database, indicating that the survey sample was representative of the wider UK leisure horse population (Hockenhull & Creighton 2013).

Statistical analysis

Descriptive statistics were used to explore the distribution of respondents across all answer categories. Seasonal variations in management routine using the seasonal definitions employed by Mellor *et al* (2001) were identified using Chi-square tests. Statistical analyses were conducted using SPSS v14 for Windows (SPSS Inc, USA).

Results

The survey generated data on 1,850 individual horses, however item non-response has led to the variation in item totals reported here. The horses were looked after by a mean (± SD) of 2 (± 1.2) people (range 1–21 people). The participants completing the survey reported spending a median (IQR) of 2 (1.5–3) h with the horse each day during the week prior to the survey's completion. The horses had resided at their current home for a mean (± SD) of 3.1 (± 3.6) years (range 5 days–28 years). Thirty percent (477/1,612) of horses in the sample were reported to live out all the time and so automatically skipped the questions regarding stabling.

Stabling

The median (IQR) time spent stabled during the twelve months the survey was online was 9–12 (5–16) h per day with a reduction April–September (5–8 [0–12]) compared with October–March (9–12 [0–16]) ($\chi^2_6 = 83.122$, n = 1,569; $P < 0.001$; Figure 1).

Table 1 summarises the distribution of survey responses related to the horses' stabling routine.

Turn-out

The median (IQR) time spent turned-out per day for the twelve months the survey was online was 9–12 (5–24) h. Time spent turned-out per day differed significantly between seasons: April–September 13–16 (9–24) and October–March 9–12 (5–24) h ($\chi^2_6 = 58.802$, n = 1,744; $P < 0.001$; Figure 2).

Table 2 summarises the distribution of survey responses related to the horse's turn-out routine.

Stable-related and handling behaviour problems

Due to a faulty software upgrade, responses to the behaviour matrix questions were not recorded for a three-month period (March–June 2007). The stable/stall-related behaviour matrix was answered for 1,226 individual horses, of these 74% (904/1,226) expressed one or more behavioural problem (see Table 3). The handling behaviour problem matrix was answered for 1,218 individual horses, 63% (769/1,218) of which expressed one or more of the handling-related behaviour problems (see Table 3).

When all twenty behavioural problems were considered together, 82% (1,012/1,230) of horses expressed one or more problem. The median (IQR) number of problems exhibited by the horses in the sample was 3 (1–5).

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Figure 1

Seasonal differences between the number of hours, on average, horses spent stabled per day during the summer (April–September) and winter (October–March) months.

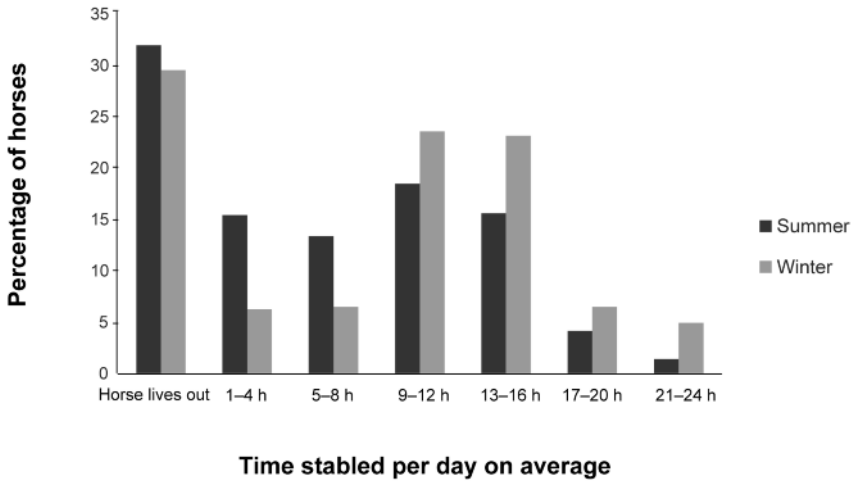
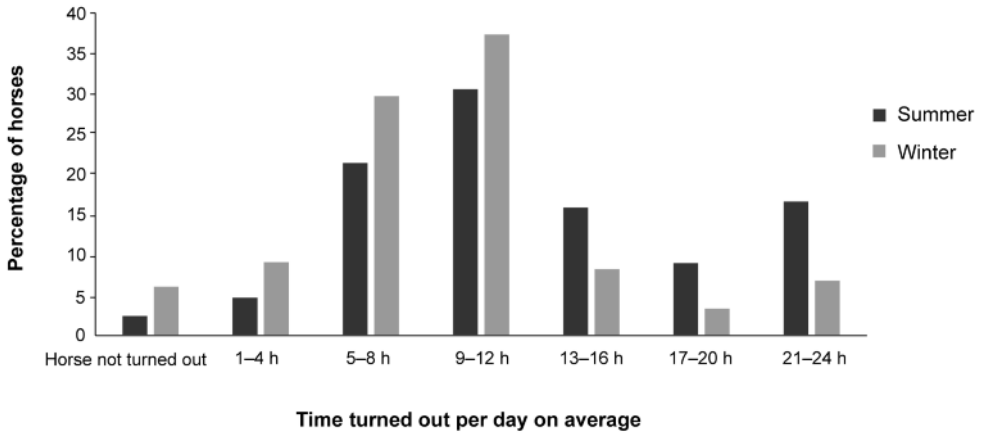


Table 1 Distribution of respondents' answers to questions relating to the horses' stabling routine.

Question	Options	Number (%)
Time spent stabled each day on average in previous week	1–4 h per day	151 (14)
	5–8 h per day	141 (13)
	9–12 h per day	339 (31)
	13–16 h per day	318 (29)
	17–20 h per day	87 (8)
	21–24 h per day	56 (5)
Stable type	Loose box/stall on a yard with outdoor opening access	719 (66)
	Loose box/stall in an enclosed barn	349 (32)
	Group-housed indoors	26 (2)
	Tethered/tie-stall	1 (< 1)
Number of other horses visible from the stable/stall	No other horses visible	37 (3)
	1–3 horses	448 (42)
	4–6 horses	311 (28)
	7–9 horses	169 (15)
	10 or more horses	129 (12)
Level of social contact possible from the stable/stall*	None (can neither see nor touch other horses)	35 (3)
	See other horses only	581 (54)
	Touch other horses only	2 (< 1)
	Able to see and touch other horses	475 (43)
Type of bedding provided	Straw	292 (27)
	Shavings	315 (29)
	Shredded paper	19 (2)
	Rubber mats	8 (1)
	Rubber mats and straw	81 (7)
	Rubber mats and shavings	297 (27)
	Other	81 (7)

* Variable derived from combining the responses to two survey questions.

Figure 2



Seasonal differences between the number of hours, on average, horses spent turned-out per day during the summer (April–September) and winter (October–March) months (excluding horses that live out).

Table 2 Distribution of respondents' answers to questions relating to the horses' turn-out routine (includes data from horses that were reported to live out; n = 477).

Question	Options	Number (%)
Time spent turned-out each day on average in previous week	Horse not turned-out	51 (3)
	1–4 h per day	90 (5)
	5–8 h per day	333 (19)
	9–12 h per day	419 (24)
	13–16 h per day	138 (8)
	17–20 h per day	74 (4)
	21–24 h per day	639 (37)
Number of horses able to interact freely with	No other horses present	141 (9)
	1–3 horses	976 (59)
	4–6 horses	300 (18)
	7–9 horses	129 (8)
	10 or more horses	104 (6)
Stability of turn-out group	No other horses present	124 (8)
	Group stays the same	1,135 (69)
	Group mostly the same with some changes	578 (23)
	Group mostly different	5 (< 1)

Discussion

The length of time the horse had spent at its current home and the amount of time it spent in contact with people per day were similar to figures reported by Hotchkiss *et al* (2007a). This suggests that it was unlikely that social desirability bias was guiding participant responses, unless the same was also true for this previous study. Seventy percent of horses within the survey sample were stabled for all or part of the day during the week preceding the survey's completion. In the winter, 70% of horses were stabled all or part of the day, compared to 74% at least partially stabled over winter in the Hotchkiss *et al* (2007) survey and 76% in the survey by Mellor *et al* (2001). During the summer, 32% of horses were reported to live out all day every day. This is the same as reported by Ireland *et al* (2011), but substantially fewer than the 58% reported by Mellor *et al* (2001) and the 48% reported by Hotchkiss *et al* (2007). The discrepancy in the findings of the surveys may partly reflect differences in question design, though some respondents left comments at the end of the survey in this study stating

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Table 3 Distribution of responses on the five-point frequency rating scale and overall incidence percentage for each stable-related and handling behaviour problem reported.

		Frequency reported (%)					
Behaviour problem	**Overall % prevalence**	**Never 1***	**2**	**3**	**4**	**Often 5**	**Sample size**
Stable-related							
Eat bedding	21	79	12	5	3	1	1,214
Drink water excessively	16	84	11	3	1	< 1	1,211
Chew wood	34	66	24	6	3	1	1,212
Crib-bite/wind-suck	6	94	2	2	< 1	2	1,199
Repetitively lick objects	14	86	9	3	2	< 1	1,208
Box-walk/pace/circle	19	81	13	4	1	< 1	1,210
Weave	7	93	4	2	< 1	1	1,201
Aggression to horses	35	65	25	6	2	2	1,212
Aggression to people	15	85	12	2	1	< 1	1,212
Bite/kick own body	4	96	3	< 1	< 1	< 1	1,209
Chew/tear rugs	8	92	5	1	< 1	< 1	1,205
Handling							
Pull faces when pass/approach stable/stall	21	79	13	3	2	2	1,209
Turn away when enter stable/stall	16	84	13	2	< 1	< 1	1,211
Try to bite/kick people entering stable/stall	5	95	3	< 1	< 1	< 1	1,205
Pull faces/fidget when groomed	40	60	25	9	4	2	1,208
Try to bite/kick when groomed	13	87	8	2	1	1	1,204
Pull faces/fidget when rugged/blanketed	27	73	16	6	3	3	1,209
Try to bite/kick when rugged/blanketed	11	89	6	2	1	2	1,201
Pull faces/fidget when tacked up	40	60	25	8	4	3	1,210
Try to bite/kick when tacked up	14	86	9	3	2	2	1,213

* n/a and never scores combined.

that their horses turn-out had been restricted to protect land from poaching (ie breaking up the ground into wet muddy patches by trampling over it) over the winter and during the extreme wet weather experienced in the summer of 2007.

That said, all four surveys found a significant proportion of horses were stabled in both summer and winter, supporting a trend identified in the National Equestrian Survey that owners are moving away from winter-only stabling towards year-round stabling (Anon-BETA 2006). This may reflect the growing restrictions on land available for turn-out as leisure horses become increasingly urbanised and if this is the case, the restriction in turn-out opportunities may come at a cost for the welfare of the horses affected (Kiley-Worthington 1997; Henderson 2007).

Thirty-two percent of horses were housed in a loose box/stall in a barn and 66% in a loose box/stall on a yard compared to 21% in a barn and 67% on a yard reported by Hotchkiss *et al* (2007). Seventy-one percent of horses could see out of their stable via openings other than the stable door, 97% of horses could see other horses from their stable and 44% could touch them.

Horses are social animals and it has been suggested that the social isolation that comes with the practice of housing them in stables/stalls can be somewhat alleviated by providing them with visual or tactile contact with other horses (Cooper *et al* 2000). Certainly, it has been found that horses will work to engage in social contact when isolated (Søndergaard *et al* 2011), indicating the value placed on these interactions and therefore their significance for welfare. However, there is evidence that the issue of social contact for stabled/stalled horses may be more complex. Other studies have suggested that it may actually be more frustrating for a stabled/stalled horse to be able to see/touch other horses (McGreevy *et al* 1995a; Redbo *et al* 1998; Hockenhull & Creighton 2014b) but not engage in full body contact that seems preferable (Søndergaard *et al* 2011; Christensen *et al* 2002). Individual differences between horses and their relationship with the neighbouring horses should also be taken into account to ensure that any social opportunities are optimal from a welfare perspective.

Fifty-six percent of owners used wood-shavings for their horse's bed and 34% used straw (either alone or with rubber matting). These levels are similar to those reported by the National Equestrian survey (Anon-BETA 2006) but a higher percentage of respondents were reported to use straw beds by Mellor *et al* (2001) and Hotchkiss *et al* (2007a). These differences may reflect a move away from straw bedding since the mid-1990s when Mellor's data were collected, and may correspond to growing owner awareness of straw as a risk factor for respiratory problems, eg recurrent airway obstruction (RAO) in stabled horses (Mills *et al* 2000; Hastie 2001; Hotchkiss *et al* 2007b). Ireland *et al* (2011) found that only 30% of owners bedded their horses on straw in their survey of geriatric horses, which may reflect the increased risk of RAO in older horses (Couëtil & Ward 2003; Hotchkiss *et al* 2007). However, straw beds are typically preferred by horses and they enrich their environment by allowing them to express their natural foraging behaviour (Mills *et al* 2000; Zeitler-Feicht 2004). So, while the decline in the use of straw bedding may be beneficial from a health perspective, it may be detrimental for the horse's behavioural needs.

Nine percent of horses were not able to freely interact with other horses when turned-out. These data may underestimate the number of horses turned-out by themselves: some respondents commented that although their horse was turned-out alone, they felt it could still "freely interact with other horses" as it could see or reach them over the fencing even though they were not physically in the same area and these respondents may not have answered this question in the way it was intended.

There is evidence to suggest that much of the value gained from turn-out comes from the social opportunities it affords the horse. A study exploring horses' motivation for exercise and turn-out found that horses chose to be turned-out for longer if it was into a group situation and for less time if they were turned-out alone (Houpt 2007). Horses spend less time grazing if they lack companionship (Singer *et al* 1999), possibly because their isolation heightens their need to be vigilant for potential threats.

The data on management practices generated by this survey have provided an insight into the day-to-day management of UK leisure horses. Some of the practices are known to be welfare concerns and have been associated with stereotypic behaviours in previous survey-based research (McGreevy *et al* 1995a,b; Redbo *et al* 1998; Bachmann *et al* 2003). Yet, there is a lack of empirical data to determine just *how* much of a problem these practices are; for example, how much stabling is *too much*. While survey-based studies can implicate a practice as a potential cause for concern, cause and effect cannot be determined from survey data and more experimental research is needed if these questions are to be resolved.

Eighty-two percent of horses displayed some form of behavioural problem based on their owner's self-reporting. Seventy-four percent of horses displayed one or more of the stable/stall-related behaviour problems, the most common being aggression to other horses and wood-chewing both of which have been attributed to environmental inadequacies (McGreevy 2004; Zeitler-Feicht 2004). Sixty-three percent displayed one or more of the handling-related behaviour problems, with pulling faces or fidgeting while being groomed or tacked up being the most prevalent. There was a tendency for participants to rate their horses at the lower end of the rating scale, ie 2 or 3, implying that while the horse displays the behavioural problem it does so at a relatively low frequency.

Every effort was made when marketing the survey to reduce the likelihood that those owners whose horses displayed unwanted behaviour would preferentially choose to participate. The survey was entitled the 'Human-horse interaction survey' and participants were told that questions would cover their horse's daily management routine. No mention was made on the introductory page that there would be any questions on their horse's behaviour. Only two survey questions focused on behaviour with the remaining sixteen focusing on management practices. Even so, it is possible that some participants whose horses did not display unwanted behaviour did not complete the survey once they got to those questions. The pilot work prior to the survey's launch suggested that this would be minimal however, as those people whose horses did not display any of the behaviours included seemed to welcome the opportunity to say how 'good' their horse was. This was reinforced by some of the comments left at the end of the survey.

The behaviours chosen for inclusion in the survey were all regularly the focus of questions included in popular equestrian publication help/problem pages. While obviously highly relevant to owners, this meant that the behaviours included were not necessarily those that research has indicated are the best indicators of welfare. Some of the behaviours can also be seen as natural behaviours for horses, such as wood-chewing and eating straw beds. Although this is certainly true in some cases, these behaviours can both indicate deficiencies in diet (McGreevy 2004) and consequently a compromise in welfare. Furthermore, there may also be implications for the horse should they display these behaviours, such as physical punishment for aggression, threats to bite or actual biting, or electrifying surfaces to prevent wood-chewing or crib-biting (McBride & Long 2001; Hockenhull & Creighton 2011). Such measures represent a welfare concern by themselves, especially if they are adopted without the owner taking steps to identify the cause of the problem and address it.

Ideally, the way in which a horse is managed on a day-to-day basis should be reviewed by the owner to ensure that the practices used meet the welfare requirements of the horse before such problems arise. However, what suits one horse may not suit another, and an owner may have to work within the restrictions imposed by the premises in which their horse is kept. In these cases, it is important to recognise any change in the horse's behaviour that may indicate that a review of current practices is needed and take action to address this as soon as possible before these behaviours become established.

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This study is the first to provide quantitative evidence that behavioural problems are present at such high rates within the leisure horse population. The welfare implications of these findings are heightened by the sheer volume of horses involved. Although past experience and intentional or inadvertent learning cannot be ruled out, individual problems should not be so readily dismissed and owners would be advised to review their horse's management should these problems arise. While not covered in this survey, the importance of the owner knowing how their horse behaves, recognising behavioural changes, and ensuring that they are handling their horses appropriately, with due regard for learning theory, cannot be overemphasised and the impact of owner-related factors in the expression of the behaviours reported in this study should not be overlooked.

Animal welfare implications

The data generated by this survey provide an important insight into how leisure horses are managed on a day-to-day basis in the UK. Understanding the way horses are managed at ground level allows research and subsequent recommendations to be tailored to suit this facet of the equine population. The high prevalence of behaviour problems suggests that some aspect of the husbandry or environment of these horses may be sub-optimal for their welfare.

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