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A preliminary study investigating the physical welfare and welfare code compliance for tethered and free-ranging horses on common land in South Wales

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Abstract

The scientific literature on horses kept on common land in the UK is limited. Welfare codes and legislation are in place to safeguard the welfare of these horses; however, it has little scientific validation. This study investigated the welfare code compliance and physical welfare of both tethered (T) and free-ranging (F) horses kept on a public common in South Wales. A welfare assessment was developed using resource-based and animal-based measures. The assessment was carried out weekly over a six-week period on all horses found on the common, a total of 37 horses, 21 tethered and 16 free-ranging were observed during some or all visits. The mean prevalence of welfare measures assessed during weekly observations of individual horses was calculated. The highest mean prevalences were recorded for rainscald, hoof overgrowth and hoof cracks. Overall, no significant differences were found between welfare indicators for tethered and free-ranging groups of horses on the same common. There were high levels of compliance with the Welsh Government code of practice covering tethering in some areas, eg having a 4-m gap between tethered horses (96% compliance), however, in other areas there was poor compliance, eg exercise off the tether for a period each day (0% compliance). Changes to management, including provision of shelter, increased access to water, exercise and farrier attention, may significantly improve welfare. However, there was no evidence that tethering itself had a significant negative impact on the physical welfare of horses.

Keywords: *animal welfare, common land, horses, legislation compliance, physical assessment, tethering*

Introduction

A preliminary survey carried out by the Welsh Assembly Government identified approximately two thousand horses kept on common land (defined as "land which is owned by one person over which another person is entitled to exercise rights of common [such as grazing animals]" Defra 2009) in South Wales (Cardiff Trading Standards, personal communication 2009). Some horses were tethered on public commons, some were free-ranging on public commons and others, such as groups of Welsh mountain ponies, are kept on much higher, remote areas. Some common grazing rights are associated with properties near the commons whereas others can be exercised by anyone, but usually by people who do not have land of their own and are not able to afford rented land (J Hotchkiss, Cardiff Trading Standards, personal communication 2009). Swansea County Council considers horses on common land to be at risk of poor welfare and a danger to the public and property, especially if they stray onto public highways (Swansea County Council 2000). However, these opinions are based on little scientific evidence.

Legislation is already in place to attempt to safeguard the welfare of horses on common land. The Animal Welfare Act (2006) replaced much of the previous legislation that covered tethered horses. This act makes it an offence if "an act of his, or a failure of his to act, causes an animal to suffer" (Crown 2006). At present, tethering is permitted by the act; although the Code of Practice for the Welfare of Horses, Ponies, Donkeys and their Hybrids (Welsh Assembly Government 2008) contains an annexe specifically dealing with the management of tethered horses. Recommendations in the annexe of the code provide guidelines on the suitability of animals, the site and the equipment used for tethering. They also stipulate requirements for food, water, shelter, exercise, supervision, identification and protection from malicious persons (Welsh Assembly Government 2008).

The welfare assessment protocol for this project was designed following a review of the literature and discussion with experts who drew on published welfare assessment methodologies (eg Leeb *et al* 2002; Jongman *et al* 2005; Pritchard *et al* 2005) to devise a protocol for assessing the welfare and legislation compliance of horses tethered on public land in South Wales (Mullan & Whay 2011). The assessment protocol designed for this study was based around the Five Freedoms (FAWC 2009). Two types of observation are regularly used in animal welfare assessment: animal-based and resource-based observations (Main *et al* 2003). A combination of these two

Table 1 The mean prevalence of physical welfare measures in tethered and free-ranging horses. The mean prevalence is defined as the mean of the six prevalences derived from weekly observations.

Physical welfare measure	Definition of assessment method	Tethered horses	Free-ranging horses
Rainscald[1]	Hair along the back is clumped or missing and skin is reddened, scabbed or weeping	34%[#]	37%[#]
Hoof overgrowth[2]	The estimated length of additional hoof length as a proportion of the expected normal length	37%[#]	33%[#]
Hoof cracks[1]	Horizontal or vertical crack in the hoof (length of crack was also measured)	24%[#]	40%[#]
Faecal staining on hind limbs[1]	Presence of faecal staining on hind limbs, but not including faeces on the tail or perineum	19%[#]	13%[#]
Lame[1]	Incomplete weight-bearing on one or more limbs when standing or walking	3%[#]	18%[#]
Quidding[1]	A horse that is eating is observed to drop food from its mouth	0%[#]	0%[#]
Limb dirtiness[3]	The highest score on any limb of the horse is recorded:	2[§]	2[§]
	Score 0: no dirt		
	Score 1: continuous dirt up to fetlock		
	Score 2: continuous dirt up to mid-cannon		
	Score 3: continuous dirt up to knee/hock		
	Score 2: continuous dirt above knee/hock		
Body dirtiness[3]	Large patch of dirt:	2[§]	2[§]
	Score 0: no dirt visible on head, neck, body or upper limbs		
	Score 1: largest patch of dirt less than a hand print (15 cm) in diameter		
	Score 2: largest patch of dirt between a hand print (15 cm) and forearm length (40 cm) in diameter		
	Score 3: the largest patch of dirt between forearm (40 cm) and arm length (70 cm) in diameter		
	Score 4: largest patch of dirt is larger than arm length (70 cm) in diameter		
BCS[3]	6-point scale from 0 to 5 (National Equine Welfare Council 2003)	3.0[§]	3.5[§]
Number of lesions[4]	Number of obvious lesions on body that result in abnormalities in skin	0[+]	0[+]

[1] Present/absent; [2] Percentage; [3] Categorical numerical rating scale; [4] Count; [#] Mean prevalence; [§] Mean score; [+] Mean number of lesions.

approaches is likely to yield the best results, therefore the assessment used in this study contained both animal-based and resource-based observations.

The scientific literature on horses kept on common land in the United Kingdom is limited; very little is known about the management of these horses and the effects of tethering. This study aimed to assess legislation compliance in tethered horses, to identify management inputs and risk factors that may affect welfare of horses and to assess aspects of health to give an animal-based indicator of welfare. It also aimed to assess whether there was a difference in welfare between tethered and free-ranging horses on the same area of common land.

Materials and methods

The study was carried out on a site in a residential district of Swansea, South Wales. The site was a 0.3 km^2 area of grassland that was semi-divided into multiple fields by 1-m high banks. It was bounded by houses, a school and in close proximity to two roads and had a public right of way across it. The study received ethical approval from the University of Bristol, UK (Investigation number UB09/049) and was compliant with its codes of practice.

Every horse found on the common was assessed. Horses at this site were observed for two days per week over a six-week period. The protocol was designed so that a full welfare assessment was performed first (starting on the morning of day 1), and then a shorter assessment was made starting 24 h later (on the morning of day 2). This allowed the horses to be observed over a 24-h period (during daylight hours) to assess legislation compliance. All horses were individually identified using horse passport forms to allow repeated measures of the same individuals, when present, over the six-week period.

A welfare assessment protocol was devised and refined following pilot testing. Welfare assessments were performed at a maximum of 1 m from the individual. No horses were restrained or handled during these assessments. The final assessment protocol included general descriptions of each horse in terms of age, breed, sex, whether it was a nursing mare and whether or not it was tethered. The animal-based measures are described in detail in Table 1 but broadly contained measures of body condition, faecal staining, quidding, lameness, hoof overgrowth, hoof cracks,

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Table 2 The degree of compliance with the code of practice for tethered horses over a six-week period.

Code of practice on tethering (Welsh Assembly Government 2008)	Proportion of observations where compliance was observed (n = 33 horses, total of 149 observations)
Nursing mothers should not be tethered	n/a
Mares should not be tethered near stallions	0%
Sick animals should not be tethered	100%
Old and infirm (disabled as opposed to injured or sick) animals should not be tethered	100%
Tethered animals should not be tethered around free-roaming animals	0%
The tether site should have good grass cover (defined as a mean of > 85% grass cover for the purposes of this study	88%
The tether site should be free from any objects that could ensnare the tether	46%
The tether site should not allow access to public highway	100%
High proportion of weeds on the tether site is not suitable (defined as > 30% of total grass cover for purposes of this study)	91%
The tether site should not be waterlogged (defined as > 1 cm of ground water for the purposes of this study	96%
The tether site should not be crossed by public right of way	0%
The tether site should not have anything on it that might injure the animal	46%
Tethered horses should have a 4-m gap between horses	95%
A well-fitting leather head collar or broad leather neck strap must be closed	0%
A swivel should be fitted on head collar/neckstrap	0%
The chain should be approximately 20 feet (6.1 m) in length	75%
Rope or nylon should not be used	0%
Ground stake must not protrude above ground level	30%
Ground stake must be fitted with a 360° swivel	25%
If no supplementary food is given the tether site should be changed once daily to ensure quality of pasture	75%
Forage food should be provided if there is inadequate grass	65%
Water should be made available on a frequent and regular basis throughout the day in spill-proof containers (defined as offered access to water during 6-h observational period for the purposes of this study)	17%
Shelter from extremes of weather should be provided	0%
Tethered horses must be given exercise off the tether for a reasonable period once a day (defined as > 5 min for the purposes of this study)	0%
Tethered horses should be checked every 6 h	90%
Tethered horses should be permanently identifiable so that keeper or owner is readily contactable	0%

signs of rainscald, number of skin lesions, limb dirtiness, and body dirtiness. The resource-based measures in the assessment were the percentage of the tethered area covered by grass and covered by weeds (defined as unpalatable, non-grass, plant material), presence of supplementary feed, water and hazards (Welsh Assembly Government 2008). A full description of how both animal-based and resource-based measures were assessed can be found in Table 1. Further observations which assessed compliance with the code of practice included whether mares were tethered near a stallion, the distance between tethered equines, the tether material, the presence of 360° swivels on the tether, and the length of tether. The full range of code compliance observations made during the study is shown in Table 2.

Statistical analysis

The prevalence of different conditions was calculated for two groups: those that were tethered all the time that they were observed, and those that were either always or sometimes observed free-ranging. The prevalence was calculated for each weekly observation and then a mean prevalence for the whole period was calculated.

The proportion of observations of tethered horses that did not meet the different aspects of the code of practice on tethering (Welsh Assembly Government 2008) was calculated. Only observations where horses were tethered were used in these calculations.

Table 3 The general description of tethered and free-ranging horses.

		Tethered (%) (n = 21)	Wholly or partly free-ranging (%) (n = 16)
Estimate of age	Adult (no sign of juvenile mane or tail)	57	62
	Juvenile (not fully grown, with a juvenile mane and tail)	43	38
Sex	Male	87	100
	Female	13	0
Breed	Cob	75	67
	Mountain pony	20	26
	Other	5	7

Binary data collected about the presence or absence of physical conditions at a particular weekly observation was converted to a percentage of observations when the animal was affected. A Mann-Whitney *U* test was used to compare observations between the two groups, tethered and free-ranging, to determine if tethering status had a significant effect. For categorical data a mean score for each individual horse over the six weekly observation points was used. A Chi-squared test of independence was then used to compare the distribution of categorical variables between the two groups. Exact significances were used to avoid assumptions associated with minimum expected counts.

Results

Study population

Thirty-seven horses were assessed on the site over the six-week period. Four (11%) of the horses were free-ranging for the whole period of observation, 12 (32%) were observed both tethered and free-ranging during the period of observation and 21 horses (57%) were tethered for the total period of observation. A free-ranging stallion was present at the site throughout the entire observational period. Table 3 displays some of the characteristics of the group of horses observed on this site.

Animal-based observations

More than one-third of horses, whether they were tethered or free-ranging, were affected by rainscald (see Table 1). The prevalence of this condition varied greatly on a weekly basis, ranging from 0 to 82% in the free-ranging horses and from 0 to 67% in the tethered group.

Greater than one-third of horses in both groups were affected by hoof overgrowth (defined as toe that is greater than two times the length of the heel [Turner 1992]). The prevalence of hoof cracks was high, 40% in the free-ranging group and 24% in the tethered group. Crack lengths ranged between 0.5 and 4.5 cm. There were no significant differences between the group of horses tethered all the time and the group that has some access to free-ranging during the observational period for any of the physical welfare measures tested above.

Compliance with the code of practice on tethering (Welsh Assembly Government 2008)

Thirty-three of the horses were tethered at some point during the study. The proportion of observations where the manner of tethering was not compliant with the welfare code (Welsh Assembly Government 2008) are shown in Table 2. There were very few (n = 2) mares in this sample; however they were tethered on the site close to free-ranging stallions during all observations.

The code of practice (Welsh Assembly Government 2008) makes provision for appropriate sites for tethering horses. The site under investigation sloped down to a central waterlogged area. Tethering sites on average had a 90% grass cover, however, 9% of the observations were of horses that were tethered on sites with greater than 30% weeds. Twelve percent of observations were of horses tethered on sites with a mean of less than 85% grass cover and for 4% of observations horses were tethered on severely waterlogged sites. In addition, 54% of observed tethering sites had obvious hazards on them including rubbish, pieces of metal and concrete boulders.

No horses had tethering equipment (attachment and tether) that complied with code of practice (Welsh Assembly Government 2008). Twenty-five percent of the observations of tethered horses had tethers shorter than 20 feet. For 70% of observations horses were tethered with stakes protruding out of the ground but 75% of horses had some form of 360° swivel at the ground end of the tether.

In 75% of observations horses were moved to a new grazing site during a 24-h period and during 65% of observations horses had access to supplementary forage food. During 17% of observations horses had continuous access to water; although this was commonly in the form of standing water on waterlogged ground or agricultural drainage ditches. During the observational period, only two horses were offered fresh water in buckets by their carer. On three separate occasions horses were observed to break free from their tether and each time the horse headed first to drink from the water source in the area.

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No tethered horses were provided with shelter. There was limited shelter on the site; only a few trees and banks that could act as wind breaks. Horses were given some exercise when they were moved from one tethering location to another however no horses were observed to be exercised off the tether for more than 5 min. Ninety percent of horses were checked every 6 h but no horses were visibly identifiable so that in the event of any problems the owner could be contacted. The Welsh Assembly Government codes of practice suggest that this could be achieved by a freeze brand, a microchip registered with a 24-h access database or by a form of identification attached to head collar or neck strap giving full details of keeper or owner.

Discussion

The results of this study have illustrated a number of actual and potential welfare problems associated with managing horses on common land. However, it has provided little evidence of a significant difference between the physical welfare of horses that are tethered and those that are free-ranging on this land. There may have been overlap in these groups as horses that were always tethered when observed may have had access to free-ranging at other times. Only four horses were free-ranging for the whole time that they were observed. It was, therefore, not possible to draw a comparison with this group as the group size was too small for analysis; instead they were included in the group that had some access to free-ranging.

In addition, a large percentage of the horses assessed were juveniles, therefore any problems associated with the management system have had limited time to affect these horses' welfare. It is unclear if this age profile of the horses on this site is typical for horses kept on common land. This study was limited by its small sample size and the single site used for the observations. It is not known whether the results of this study would be replicable to other areas.

One of the most significant problems observed was the high prevalence of rainscald. Rainscald is primarily due to the opportunistic pathogen (*Dermatophilus congolensis*) and is commonly associated with prolonged wetting of hair and skin (Pilsworth & Knottenbelt 2007). None of these horses had shelter from rain. This condition is both painful and can be pruritic (Pilsworth & Knottenbelt 2007). There was no evidence of any attempt to treat these animals.

Hoof cracks and overgrowth were prevalent in this population of horses. There is much debate about whether domestic horses can self-maintain their feet. However, Ovnicek *et al* (2003) suggests that although some horses can self-maintain their hooves, they need a minimum of five miles free-roaming a day in order to achieve this. From informal observation, it seems unlikely that tethered horses can achieve this due to the small area and limited opportunity to exercise. There was no evidence of hoof care, such as by a farrier, during the six-week period of observation.

Lameness is a significant welfare problem often indicating pain (Whay *et al* 2003). The prevalence of lameness in this population was low and not significantly different between the tethered and free-ranging groups. However, two of the free-ranging horses were lame for the whole of the observational period. The study shows that 90% of tethered horses were checked every 6 h in accordance with the code of practice (Welsh Assembly Government 2008) suggesting there is good compliance in this area. However, the guidelines do not state what checking must involve; most tethered horses were offered forage and moved and the free-ranging horses were visually checked. It is not clear from this study what effect this level of observation had on the welfare of the horses.

Horses on the site were fed predominantly on grass and roughage. Despite guidance governing the quality of grass on tethering sites (Welsh Assembly Government 2008) many animals were tethered on sites with limited grass cover and areas of water logging. However, in over 50% of observations, horses were given supplementary forage. Most horses observed had good body condition and no horses were classified as thin. This data suggest that despite limited access to food, horses receive sufficient nutrition. Data from this project found no significant difference in the mean body condition score between tethered and free-ranging animals, suggesting that horses in both groups get appropriate food intake to maintain their body condition score.

Despite the fact that these horses appear to receive adequate nutrition, the access of tethered horses to water was poor. Tethered horses had continuous access to water in less than 20% of observations; when water was available this was mainly in the form of standing water on fields or agricultural drainage ditches. McDonnell *et al* (1999) suggest that continuous access is not an absolute requirement for good welfare and that intermittent access (at least 5 min three times daily) to water has no effect on the physiological or psychological well-being of horses. However, over the observational period, only three horses were observed to be taken to water and three of the horses observed were brought water in a bucket twice a day. No measurement of dehydration was taken during the assessment. Work by Pritchard *et al* (2008) suggests that the volume of water consumed and the number and duration of drinking bouts are the most reliable guide to hydration status in working horses. Tests for dehydration could be added for the protocol used in further work in the area. On one occasion a horse was observed to break free from its tether and it immediately went to the water baths to drink suggesting that thirst may be a welfare problem for these horses.

Tethering equipment was the area with the poorest compliance with the code of practice (Welsh Assembly Government 2008). The code of practice contains very specific recommendations regarding the equipment used to tether horses. Instead of using the recommended leather head collars or neck straps, horses were observed with ropes tied around their necks or webbing head collars or neck straps. However, despite this lack of compliance no lesions were observed.

There were, however, areas of poor code compliance where welfare problems resulted. The lack of shelter is a serious welfare concern and improving access to shelter for these

animals might significantly improve their welfare, for example by reducing the risk of rainscald.

This study investigated the physical welfare and legislation compliance of the tethered and free-ranging horses and did not include an assessment of the behaviour of the horses. It might be imagined that the space restrictions afforded by the tether would result in some negative consequences on the welfare of these horses which were not identified in this study.

Animal welfare implications

The information gathered in this study has provided an overview of how tethered and free-ranging horses on a common in South Wales were managed, and the resources available to them. Conditions such as rainscald, hoof overgrowth and hoof cracks were found to be present in both free-ranging and tethered horses. Compliance with the welfare code was found to be variable and in some instances poor compliance with the welfare code was associated with poor animal-based measures of welfare. The assessment also highlighted some areas where changes to management, including provision of shelter, increased access to water and increased exercise would likely improve welfare. However, the study has provided no evidence that tethering itself has a significant negative impact on the physical welfare of the horses on this site.

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