A comparative study of the application of two horse welfare assessment protocols

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Abstract

Two assessment protocols for horse welfare were compared: the Swedish official protocol (OP) and a newly developed horse welfare assessment protocol (HWAP). The protocols differ in composition: the HWAP contains 20 animal based (35.7%), 28 resource based (50.0%) and 8 management based (14.3%) measures whereas the OP has 4 animal based (8.9%), 21 resource based (46.7%), 16 management based (35.6%) and 4 uncategorized measures (8.9%). The HWAP detected more welfare issues than the OP for 11 out of 12 welfare criteria. The OP took less time to assess (2–4 hrs) compared to the HWAP (3 hrs 20 min – 8 hrs 40 min). The added level of detail and more animal based measures means that the HWAP provides a more thorough assessment of welfare of the individual animal than the OP.

Keywords: Animal based measures, assessment guidance, equine welfare, legislation, welfare officers

Introduction

The relationship between human and horse began about 6000 years ago but the behavioural and physical needs of the horse are not thought to have fundamentally changed with domestication (Budiansky, 1997). However, contemporary horse management and housing do not always take these needs into full consideration which in turn may negatively affect horse welfare (Mills & Clarke, 2007).

Assessment and monitoring of horse welfare and housing and management practices can help to identify actual welfare problems and risks for welfare, it can also raise awareness in owners and caretakers. Based on the provision of feedback to the owner (e.g. assessment results, bench mark comparison and science based information on risk factors), corrective actions to improve welfare can be encouraged (Blokhuis et al., 2010). Current legislation specifically related to the keeping of horses can also prevent certain welfare risks if compliance is adequately controlled.

A welfare assessment should cover freedom from suffering and distress (e.g. prolonged pain, fear, hunger and thirst), a high level of biological functioning (e.g. absence of disease, injuries,

41 malnutrition) and opportunities for positive experiences (e.g. comfort, contentment, expression of
42 species specific behavioural repertoire) (Fraser, 1993).
43 There are three types of welfare assessment measures: animal based (AB; behaviour, coat
44 quality etc.), resource based (RB; surroundings; housing size, floor type etc.) and management based
45 (MB; managerial decisions; time in paddock, feeding regime etc.). A combination of these measures
46 is required to detect (early) signs of reduced welfare and to identify risks (Blokhuis et al., 2010;
47 Blokhuis et al., 2013; Visser et al., 2014; Viksten et al., submitted).

48 In the last decade protocols based mostly on RB measures have been criticized for not
49 assessing the actual welfare status of the animals themselves (Bracke et al., 1999; Blokhuis et al.,
50 2003; Viksten et al., submitted), mainly because the relation between specific resources and the actual
51 welfare status of the animals is not always very clear. Management practices and the animals' genetic
52 background can for example influence the relation between the quality of a resource and actual
53 achieved welfare (Blokhuis et al., 2013). Thus, focus has shifted to include more AB measures and to
54 identify related risk factors. Ideally, an assessment protocol should assess welfare from the animal's
55 point of view, monitor changes over time and identify risk factors (Sorensen et al., 2001; Viksten et
56 al., submitted).

57 A number of horse welfare assessment protocols are available but international
58 standardization of measures is lacking; this hampers meaningful comparison and interpretation of
59 results worldwide. The purposes of the various protocols also differ and some, such as the Swedish
60 one for official controls (OP), focus specifically on establishing legislative compliance (Statens
61 Jordbruksverk, 2009; 2012). Others aim more at assessing the actual welfare status and providing a
62 basis for improvement ('assess and improve'), these include the 'Australian Welfare Protocol' (AHIC,
63 2011), the 'Assessment Protocol for Horses' (Wageningen UR, 2012) and the 'AWIN Welfare
64 assessment protocol for horses' (AWIN, 2015). 'Minimum standards of horse care in the state of
65 California' (Miller, 2010) and the 'Horse Welfare Assessment Protocol' (HWAP) (Viksten et al.,
66 submitted) are other examples of the latter category. In some countries advice is given on best
67 practice, e.g. 'Equine Industry Welfare Guidelines Compendium for Horses, Ponies and Donkeys'

(NEWC, 2008) in the UK and 'Gids Goede Praktijken' (Sectorraad Paarden SRP, 2011) in The Netherlands, but the recommendation are not necessarily enforced.

Sweden's horse welfare legislation aims to prevent welfare problems and mainly describes resource requirements. It consists of the Animal welfare law (Djurskyddslagen, SFS 1988:534), the Animal welfare regulation (Djurskyddsförordningen SFS 1988:539) and the Guidelines for horse keeping (Statens Jordbruksverk, 2007). If compliance is insufficient penalties such as injunctions, fines and seizure of the horse(s) followed by a prohibition to keep horses can be enforced. Compliance is assessed by Animal Welfare Officers from the County Administrative Boards using the OP for horses (Statens Jordbruksverk, 2012) and its guidelines (Statens Jordbruksverk, 2009; 2014). The HWAP, which is based on the 'Assessment Protocol for Horses' (Wageningen UR, 2012), was recently refined and tested under Swedish conditions (Viksten et al., submitted). The HWAP aims to further improve horse welfare through more detailed, scientifically based assessments that focus on the individual animal and the provision of feedback to the animal owner and stable manager. Its structure follows the Welfare Quality® (WQ) approach, covering the relevant domains of welfare: good feeding, good housing, good health and appropriate behaviour. The present study was designed to compare the application and outcomes of the OP with that of the HWAP. The following research questions were addressed:

1) How do the protocols cover the different welfare domains?

2) What type of measures are used to assess those domains?

3) Do they detect the same welfare issues?

4) How much time do the assessments take?

Material and methods

The study was approved by the Uppsala Ethical Committee permit no C145/11 and C319/11.

Assessments in situ

The study was conducted between January and March 2014 and included 26 stables (8–56 horses per stable) consisting of 17 riding schools, 3 livery yards, 3 tour riding stables, 2 private stables and 1 public demonstration stable. A total of 497 horses (ages 3–36 years; 341 geldings, 152 mares, 4

stallions) that were used for various purposes (113 all round, 355 riding school/educational, 9 working equitation, 3 dressage, 8 show jumping, 1 circus, 3 driving, 3 western, 2 broodmares) and kept in various housing conditions (43 group, 372 box, 82 tie-up stall) participated in the study. These housing conditions are representative of those to be found in Sweden (Enhäll et al., 2012).

The stable owners or managers were contacted via telephone and selected for inclusion in the study if they had at least eight horses and a staff member available to handle horses during lameness assessment. The stables chosen also represented various housing systems. The horses' welfare status was unknown to the assessor prior to assessment.

The HWAP assessment began in the early morning and an OP assessment (Statens Jordbruksverk, 2012) was carried out in the afternoon of the same day. All assessments were conducted by the same assessor who had extensive experience of both HWAP and OP protocols and had previously worked as an Animal Welfare Officer in Sweden.

Assessments were carried out using an updated HWAP protocol (Viksten et al., submitted); the alterations and additions are shown in Table I. These alterations were based on experience gained during the first pilot test of the HWAP and its results (Viksten et al., submitted). Measures were scored in line with the WQ® approach and mostly on a scale of 0–2 where 0 reflected the least severe and 2 the most severe with regards to negative effects on welfare. Some measures were binary: 0 = not present or 1 = present. Body condition scoring (BCS) was measured on a scale from 0–5, e.g. 0, 0.5, 1, 1.5, 2 etc. (Carroll & Huntington, 1988; Wright et al., 1998). Apart from lameness assessment, which was conducted outside, all AB measures were conducted with horses loose in the boxes or haltered in tie-up stalls. The horses were only haltered and held by personnel if they were aggressive or showed avoidance. Relative Humidity (RH) and Temperature (T) were recorded using a RHT meter (model FHT100 manufactured by Geo Fennel) outside before entering the stable and inside before the horses were taken out.

[TABLE I somewhere here]

All RB measures in the OP (e.g. housing size) were assessed in the stable before the horses were brought in from the paddock. Where there was group housing other horses could be present

during assessment. The OP has answer options regarding compliance with each control point: yes, no, not assessed or not applicable.

All measures of size in both protocols (trough heights, box lengths, widths etc.) were recorded with a laser distance meter (model D2, manufactured by Leico Disto).

Comparing protocols

The criteria and principles of good welfare applied in the WQ® approach (Blokhuis et al., 2010) were used to group the measures in each protocol to allow comparison of the coverage of different welfare domains, relative differences in detection of welfare issues and risk factors (i.e. number of stables where a welfare issue was present) and the numbers of measures from each category (AB, RB and MB) were included in the different domains. The title of the eighth WQ® criterion was, in accordance with Visser et al. (2014) , altered from 'Absence of pain induced by management procedures' to 'Absence of discomfort caused by use' since the original name refers to procedures like dehorning of cattle or beak trimming in chickens which are irrelevant in horses. The time needed to complete an assessment with each protocol was also recorded.

Data analysis

The results of assessments were entered into Microsoft Office Excel 2010. Since the scoring scales differed between protocols, all results for each measure were converted to an average for the stable and then to 'welfare issue present' ('mean score > 0' in the HWAP and 'non-compliance' in the OP) or 'no welfare issue' ('mean score = 0' in the HWAP and 'compliance' in the OP). Body condition was scored as 'present issue' if any horses in the stable had a BCS that deviated from 3. Visual horizon (the horse's ability to see out over the border of its own stable, i.e. to see and interact with other horses in the stable or yard) was scored as 'present issue' if any horse in the stable had 0 for visual horizon, indicating that there was at least one horse that had no ability to interact with its surroundings.

Results

The protocols differed regarding the mix of measures: the HWAP contained 20 AB (35.7%), 28 RB (50.0%) and 8 MB (14.3%) measures whereas the OP had 4 AB (8.9%), 21 RB (46.7%) and 16 MB (35.6%) measures as well as 4 measures (8.9%) that did not fall under either category (Table II).

[TABLE II somewhere here]

The sampling methods also differed: the HWAP examined each animal individually and measured all resources whereas the OP used a random sample of animals or resources or identified non-compliances based on a screening of the animals at group level or a general overview of resources.

[TABLE III somewhere here]

The protocols had 21 measures that were considered similar enough by the assessor (e.g. lameness and water quality) to be directly comparable (Table III) despite differences in assessment methodology. Detection of existing welfare issues differed between protocols; the HWAP identified more stables with welfare issues than the OP in 11 of the 12 welfare criteria and in 19 of the 21 common measures (Table III). For some welfare measures (e.g. interior of housing, risk of injury, condensation and coat quality) the protocols identified different numbers of welfare issues (columns five and seven in Table III) as well as different stables where welfare issues were detected (column six in Table III).

Depending on the stable the HWAP took between 3 hrs 20 min – 8 hrs 40 min to complete; this included 5–15 min per horse for AB measures, 1–2 hrs for RB measures and around 1 hour for interviewing the stable manager regarding routines. The OP took between 2–4 hrs including 10–15 min for checking documents (passports etc.).

Four horses that showed aggressive behaviour (tried to kick or bite the assessor) were excluded from the study for safety reasons. Two horses had to be haltered by personnel during the physical assessment (one showed avoidance and the other was slightly aggressive). In 15 of the 26 stables (57.7%) the lameness assessment was fully or partially excluded due to weather conditions

and/or lack of personnel. Thus 362 of the 497 horses (68.8%) were excluded from the lameness assessment.

Discussion

The two protocols compared here were designed for different purposes; the HWAP aims to assess the horses' actual welfare status whereas the OP assesses compliance with legislation. Both protocols can identify possible risk factors.

All welfare criteria from the WQ® approach are covered by both protocols but with different numbers and combinations of measures. Although the qualities of resource and management factors are undoubtedly relevant for the protection of the horses' welfare, their relation with welfare status is not always clearly understood and may vary between individual horses. The HWAP focuses more on actual welfare status and therefore uses more AB measures. The combination of AB, RB and MB measures can help identify possible risk factors even before the horse shows detectable signs of compromised welfare. This collective approach can thereby prevent the development of welfare problems.

The different protocols resulted in differences in the number and type of welfare issues detected under the various welfare criteria as well as the numbers of stables where such issues were detected (Table III). However, the fact that some stables were found to have a welfare issue by only one of the two protocols could simply reflect the time of measuring or methodological differences. For example differences in condensation scores may simply reflect the fact that the HWAP was applied in the morning and the OP in the afternoon. For this specific parameter it would be best to monitor stable climate, including condensation, continuously in order to establish diurnal variation and possible welfare risks. In another example the OP indicated that a particular object posed a risk of injury in one stable but this was not registered by the HWAP. This simply reflects the fact that the OP assessed this risk in the absence of a horse whereas the HWAP was conducted when the horse was present; it was then clear that the horse's size (a Shetland pony) rendered it impossible for it to reach the object. In yet another example the OP gave a low score for cleanliness (risk factor) because of a

198 thick layer of dried mud on the horses but the HWAP assessment conducted earlier in the day
199 indicated no current welfare problem because coat and skin quality were in good condition underneath
200 the mud. Of course, mud on the horse can be a risk factor for welfare (e.g. skin condition issues) if it
201 is not regularly removed. This illustrates the importance of assessing management routines.

202 This study also identifies room for improvement. Firstly for example, there was only one
203 assessor to conduct both protocols so they were conducted sequentially, starting with the more
204 detailed (HWAP) in the morning (to enable measurement of RH and T whilst horses were indoors).
205 This am/pm time difference may have affected some outcomes, e.g. the cleanliness of troughs and risk
206 of injury depend on presence of horses and management regimes. Secondly, both protocols were
207 conducted on the same day by the same assessor so memory of issues detected earlier in the day may
208 have introduced some bias into the second assessment.

209 Other potential sources of inconsistency between protocols may be caused by the lack of clear
210 definitions in the OP. For example in the context of 'good feeding', Swedish legislation states that
211 horses should be able to feed 'naturally' but this is only subjectively assessed in the OP. In contrast,
212 the HWAP clearly defines several objective measures of 'good feeding' such as BCS, possibility to
213 feed undisturbed by other horses, time with available roughage, amount of feed, and presence of
214 enrichments designed to promote feed seeking behaviour. Guidance for the assessor can also be
215 provided through pictures and a brochure with instructions (e.g. 'Assessment Protocol for Horses'
216 (Wageningen UR, 2012)) which will be helpful both during training and at assessments.

217 Water availability is essential for good welfare (Groenendyk et al., 1988; Nyman & Dahlborn,
218 2001; Reeves et al., 1996) and Swedish legislation requires water to be 'hygienic and clean' and that
219 horses should be able to drink 'naturally' (Landsbygdsdepartementet, 1988), but 'naturally' is not
220 defined in the OP. Current legislation requires that horses are given free access to water at least twice
221 daily (Statens Jordbruksverk, 2007) but such limited access is risky (Hudson et al., 2001; Reeves et
222 al., 1996) as horses can voluntarily drink more than twice daily (Houpt, 1991; Scheibe et al., 1998).
223 Clearly, legislative changes are required so that natural drinking needs of horses are met. The HWAP

assesses the horses' ability to drink through water availability, drinker flow and function, number of horses per drinker in the paddock and cleanliness of water and drinkers.

Another reason why protocol outcomes differ is the measureable unit. Although similar measures are used in both protocols the OP looks at the whole group and identifies resources and 'stand-out' animals requiring further assessment. Since horses are often individually managed, group level assessment, like the OP, can overlook welfare issues (Lundmark et al., 2015). On the other hand the HWAP assesses individual horses and each defined resource and can thereby detect problems that were overlooked by the OP; herein these included BCS, function of drinkers and automatic systems, mould in the stable and equipment chafing. BCS scores exceeding three are a commonly occurring welfare issue in horses (Thatcher et al., 2008; Visser et al., 2014) and in our view BCS assessments requires individual scores, indicating the range and counting the number of horses with a too low or too high score at each stable. By analysing deviations from score three and relating it with other measures, e.g. feeding regimes and time in training, more effective feedback can be provided to the owner which encourages and enables improvement.

Although the use of horses can pose several welfare risks, such as damage from the bit on the corners of the mouth, chafing from equipment, back soreness and lameness (McGreevy, 2007; Egenvall et al., 2010; Hockenhull & Creighton, 2012), these are hardly assessed in the OP. Conversely, the HWAP includes several important AB measures such as scoring the corners of the mouth for wounds, a simplified lameness assessment, palpation of back muscles to detect soreness and signs of chafing. Locomotory problems account for 70% of insurance claims in Swedish riding schools (Egenvall et al., 2010) and lameness is associated with risks of back pain and aggression (Landman et al., 2004; Thomsen et al., 2008; Fureix et al., 2010). Although good intra- and inter-observer-repeatability in lameness assessment can be difficult to achieve and requires an experienced assessor (Viñuela-Fernández et al., 2011), reliability can be improved with a simple scoring system using crude categories (Burn et al., 2009) such as used in the HWAP. Lameness was detected by the HWAP at several stables but not by the OP (which fails to assess horses individually on a hard surface). Such HWAP outcomes should alert the stable manager to initiate remedial actions such as

improved housing, training regimes and equipment and thereby alleviate physical and mental discomfort. Managerial regimes and staff education can affect the occurrence of injury and the longevity of riding school horses (Lönnell et al., 2012) and should therefore be included in welfare assessment as potential risk factors.

The OP incorporates little direct observation of behaviour except under socially isolated circumstances where apathy or stress is apparent. In contrast, the HWAP assesses occurrence of undesirable behaviours, opportunity for social contact (touch, smell, vision etc.), numbers of horses in the paddock and visual horizon in the housing. Of course, full physical contact can pose a risk of injury and this should be taken into account when evaluating assessment results. This is an area where both protocols could be improved. If detected, aggression and risks of injury in group-kept horses (in housing or paddocks) may be reduced by their correct grouping with regard to age and gender, the careful introduction of new horses into an established group and supplying horses with sufficient resources (Hartmann et al., 2009; Keeling et al., 2010; Hartmann et al., 2012).

It takes longer to conduct the HWAP (3 hrs 20 min–8 hrs 40 min) than the OP (2–4 hrs). This reflects the higher level of detail and the assessment of individual horses in the HWAP. The varying times required for the HWAP depended on: how quickly the personnel were able to assist with lameness assessment (taking horses out of the stable); how many horses had to be held by them; if horses were wearing rugs that had to be removed; the layout of the stable and facilities in regards to walking distance and the type of housing (it takes longer to assess loose housed horses because individuals have to be located first). Many stables were partially (only conducted on some horses) or fully excluded from the lameness assessment due to weather conditions (icy surfaces) which is a difficult factor to overcome since most facilities lack an indoor surface suitable for lameness assessment. Some stables also lacked sufficient staff to assist the assessor on the day of assessment.

In summary, assessment of the actual welfare status is of primary importance in any effort to detect welfare problems and risk factors, thereby making the HWAP a valuable tool for improving horse welfare. It could also potentially be used within official controls and self-assessment schemes to

facilitate certification of stables from a welfare perspective. The added level of detail in the HWAP provides a thorough, albeit more time-consuming, assessment of welfare status, existing problems and potential risks. This sort of comprehensive overview which covers the different welfare domains enables the provision of clearer feedback to owners, potentially leading to more effective improvement of horse welfare.

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Table I. Additional measures now incorporated in the original HWAP (Viksten et al. submitted) presented in the order they were assessed along with the scoring and definition.

Measured whilst horses were feeding in the morning		
Measure	**Score**	**Description**
Undesirable behaviour	0 = Calm; no aggression or undesirable behaviours 1 = One or a few horses displaying undesirable behaviour or aggression 2 = Several horses displaying aggression or undesirable behaviour	Direct observation of interactions between horses whilst feeding. Stereotypies excluded.
Measures assessed in group housing, boxes or tie-up stalls whilst the horses were eating in the morning.		
Back palpation	0 = No soreness or pain 1 = Horse reacts by avoidance or aggression and tension of back muscles	Manual palpation from withers to the SI-joint.
Mouth health	0 = No injuries 1 = Depigmentation OR chafing 2 = Depigmentation AND chafing OR open wounds	Observation of lower part of mouth and corners of mouth by folding it out with thumbs.
Undisturbed feeding	0 = Possibility to eat without visual contact or threat from other horses 1 = No possibility to eat without visual contact or threat from other horses	Observation of each horse whilst feeding on roughage.
Behaviour towards assessor	0 = Positive; interested with ears forward, may include sniffing or moving towards assessor with body or head 1 = Neutral; not interested in assessor, no movement 2 = Aggression or avoidance; threatening with ears pinned back, visual threat, kicks or avoidance	Horse assessed during the approach and touching involved in physical measures.
Measures assessed with horses present in the paddocks		
No of drinkers	Horses per drinker	Horses per available water drinker in paddock.
Assessed throughout the day		
Risk of injuries	Note of items causing risk of injury	Direct observation of whole stable and paddock.

Table II. Measures included in both the Official Protocol (OP) and the Horse Welfare Assessment Protocol (HWAP). Protocol structures in terms of mix of animal- (AB), resource- (RB) and management-based (MB) measures and total number of measures per welfare criterion are structured according to the principles and criteria used in the Welfare Quality® approach.

		HWAP 56 measures in total			**OP 45 measures in total**		
WELFARE PRINCIPLES	**WELFARE CRITERIA**	**AB 20 (35.7 %)**	**RB 28 (50.0 %)**	**MB 8 (14.3 %)**	**AB 4 (8.9 %)**	**RB 21 (46.7 %)**	**MB 16 (35.6 %)**
Good feeding	**Absence of prolonged hunger**	BCS	Amount of feed (roughage and concentrates) Access to pasture Height of feed Cleanliness of trough Undisturbed feeding	Estimated time with available roughage	BCS	Ability to eat naturally	Feeding regimes
		Total 7 measures			**Total 3 measures**		
	Absence of prolonged thirst		Water availability in stable and paddock Drinker flow Drinker function No of drinkers Type of drinker Water height Water cleanliness			Ability to drink naturally Water availability and quality	Daily inspection of function of automatic systems
		Total 7 measures			**Total 3 measures**		
Good housing	**Comfort around resting**	Chafing or wounds on hocks and protruding joints	Size of stall/box Noise level		Cleanliness of horses	Housing is of adequate size Noise levels acceptable Bedding quality and usage	
		Total 3 measures			**Total 4 measures**		
	Thermal comfort	Signs of thermal discomfort	Ventilation (RH and T) Fresh air inlet Shelter			Housing for all horses during cold season Air quality and climate Emergency ventilation Outdoor kept horses	

		Total 4 measures			**Total 4 measures**		
	Ease of movement		Housing type Ceiling height Paddock size	Time in training per day/week Time in paddock per day/week Yearly pasture/rest		Tie-up of horses Ceiling height Paddock quality (size)	Time spent in paddock Housing for breeding and foaling
		Total 6 measures			**Total 5 measures**		
Good health	**Absence of injuries**	Lameness Hoof condition Wounds Bumping into things or slipping when moving to paddock	Paddock surface Risk of injuries in housing/paddock	Farrier intervals	Hoof care routines	Housing design causes no risk of injury Housing floor surface Sufficient lighting in housing Paddock quality (surface)	Daily inspection by owner Harmful objects kept away from horses Procedures in case of fire and electrical failure
		Total 7 measures			**Total 5 measures**		
	Absence of disease	Coughing Hampered breathing Ocular and Nasal discharge Skin and coat condition Mane and tail condition	Mould in stable Condensation	Roughage fed without water Order of feed types		Daylight inlets in housing Cleanliness of housing Cleanliness of bedding	Sick/injured horses are given adequate care Documentation of veterinary treatments Extra inspection of horses in need of it by owner Use of hormones Operations by veterinarian
		Total 11 measures			**Total 8 measures**		
	Absence of discomfort caused by use	Mouth health Equipment chafing Back palpation	Rug cleanliness			Equipment	No use of electrical equipment Breeding and foaling
		Total 4 measures			**Total 3 measures**		
Appropriate behaviour	**Expression of social behaviour**		Possibility for social interaction	Group size in paddock	Need for social contact fulfilled		
		Total 2 measures			**Total 1 measures**		
	Expression of other behaviours	Stereotypy Undesirable behaviour	Enrichments				Weaning routines

		Total 3 measures			**Total 1 measures**		
	Good human-animal relationship	Behaviour towards assessor					Suitability of staff
		Total 1 measures			**Total 1 measures**		
	Positive emotional state		Possibilities for visual horizon				
		Total 1 measures			**Total 0 measures**		
					Other (4 measures, 8.9 %): ID papers, Horses kept for other intention than use as food, Valid permit and Other observed welfare issues		

Table III. Numbers of stables where welfare issues were detected in each protocol at measure and at criterion level. Measures with no detected issues by either protocol were excluded. * = measures absent from the protocol.

WELFARE PRINCIPLES	WELFARE CRITERIA	Measure		NUMBER OF STABLES with welfare issues per measure			NUMBER OF STABLES with welfare issues per criterion		
		HWAP	OP	HWAP	BOTH PROTOCOLS	OP	HWAP	BOTH PROTOCOLS	OP
Good feeding	Absence of prolonged hunger	BCS ≠ 3	BCS ≠ 3	26	22	22	26	22	22
		Feeding trough cleanliness	*	17	-	-			
		Undisturbed feeding	*	8	-	-			
		Time with available roughage	*	3	-	-			
		Feed without water	*	3	-	-			
		*	Ability to eat naturally	-	-	0			
	Absence of prolonged thirst	Water availability	*	3	-	-	18	2	2
		Drinker function	Automatic systems	7	2	2			
		Cleanliness of water and drinker	Water hygiene and quality	18	0	0			
		*	Ability to drink naturally	-	-	0			
Good housing	Comfort around resting	Bedding	Bedding	2	1	3	3	3	5
		Housing size	Housing size	1	1	5			
		*	Cleanliness of horses	-	-	1			
		Noise	Noise	3	3	3			
	Thermal comfort	*	All horses have a space in housing	-	-	0	15	4	5
		Ventilation	Ventilation	4	1	5			
		Fresh air inlets	Fresh air inlets	15	4	4			

		*	Fencing condition	*	-	1			
	Ease of movement	Paddock surface quality	Paddock surface quality	10	0	0	10	1	9
		Risk of injury in paddock and housing	Interior of housing	2	1	9			
Good health	**Absence of injuries**	Wounds	Wounds	10	0	0	10	0	0
		*	Chemical storage	-	-	0			
		Lameness	Lameness	3	0	0			
		Hoof condition	Hoof condition	1	0	0			
		Bumping into things or slipping between stable and paddock	*	2	-	-			
		Mould	Mould	7	1	1			
	Absence of disease	Condensation	Condensation	6	2	3	22	2	3
		Mane and tail condition	Mane and tail condition	3	0	0			
		Coat quality	Coat quality	13	0	1			
		Skin condition	*	21	-	-			
		Ocular discharge	*	22	-	-			
		Order of feed types	*	2	-	-			
		Cough	Cough	2	0	0			
	Absence of discomfort caused by use	Mouth health	*	23	-	-	23	1	1
		Equipment chafing	Equipment chafing	19	1	1			
		Back palpation	*	10	-	-			
		Rug cleanliness	Rug cleanliness	3	0	0			
Appropriate behaviour	**Expression of social behaviour**	Social contact	Social contact	5	0	0	5	0	0
	Expression of other behaviour	Stereotypy	*	8	-	-	19	-	1
		Undesirable behaviour	*	6	-	-			
		Enrichment	*	19	-	-			
		*	Weaning routines	-	-	1			

	Good human-animal relationship	Behaviour towards assessor	*	21	-	-	21	-	*
	Positive emotional state	Visual horizon	*	3	-	-	3	-	*