HEALTH-RELATED PARAMETERS FOR WELFARE ASSESSMENT IN BREEDING AND WORKING HORSES

Anamaria BLAGA PETREAN[1#], Alexandru CORA, Liviu BOGDAN[1], Silvana POPESCU [1]

[1]Faculty of Veterinary Medicine, 3–5 Manastrur Street, 400372, Cluj-Napoca, Romania;

RESEARCH ARTICLE

Abstract

The aim of the paper was to assess the welfare of two horse category (breeding and working horses). The assessment included 50 breeding horses and 40 working horses and it was based on health indicators: hair coat condition, hair quality in the mane/tail, body lesions, lower leg lesions, swollen tendons/joints, hoof horn quality, hoof walls' length, quality of horseshoes, lameness, gait, dyspnea, cough, nasal and ocular discharge, diarrhea, dental check and vision. The data were analyzed using the SPSS statistical software (version 17). Differences were considered significant if P < 0.05. Working horses had more welfare problems compared to breeding horses, especially body injuries, lower leg and gait problems, respiratory disorders and diarrhoea.

Keywords: indicators, protocol, health, horse, welfare.
#Corresponding author: anamaria.petrean@usamvcluj.ro

INTRODUCTION

Animal welfare is a valuable but difficult area of research in which strong emotional and popular beliefs (Korte et al, 2007) may outweigh scientific evidence. However, regular monitoring of the horse's health can optimize its welfare and reduce situations that can negatively impact it. The most commonly reported health issues in working equids are wounds and lesions, poor body condition, gait abnormalities and diseases (Pritchard et al, 2005; Sells et al, 2009; Ali et al, 2016). Despite their high socio-economic importance, working equids are often not included in agricultural and animal health policies, education systems and research [9]. Regarding breeding horses there is a general lack of data about their welfare (Campbell and Sandøe 2015; Popescu et al, 2019).

Several physical and behavioral factors can indicate both the release of chronic stress and a positive one-time situation. To ensure the animal's well-being, it is important to check for injuries or swollen areas after training or competition. The AWIN welfare assessment protocol includes a check for prolapses (uterine, anal, or vaginal), which are considered welfare signals (Dalla Costa et al, 2016; Hewes et al, 2011*).* Assessment protocols frequently include evaluation of hoof condition, as well as symptoms such as coughing, eye, nose, and genital mucus. Lameness, potentially related to acute pain or discomfort (Ross & Dyson, 2003), can reveal chronic problems (Landman et al, 2003) and thus become a welfare issue. In the horse, injuries located in the distal limb are one of the major causes of lameness (Crișan et al, 2018). Clinical evaluation of lameness is generally based on visual scoring. Body postures are used to assess animals' chronic states. The presence of chronic vertebral disorders, related to lameness (Fonseca et al, 2006; Goff et al, 2007; Landman et al, 2003), changes in gait (Fonseca et al, 2006; Goff et al, 2007) or asymmetry of the pelvic bony prominences (Goff et al, 2007; Haussler, 1996), is commonly considered as one of the most widespread causes of impairment of working horses' welfare (Lesimple et al, 2016; Goff et al, 2007; Haussler, 1996) and can induce muscular hypertonicity (Lesimple et al, 2020). Magnesium has muscle-relaxing properties and helps to reduce muscle tension during periods of intense exercise. Magnesium chloride promotes relaxation in stressed horses (Gherghiceanu et al, 2003). When it comes to breeding horses, certain studies have indicated that health issues were more prevalent among stallions compared to mares. This discrepancy is likely due to differences in their housing conditions. Discomfort or painful conditions can result from injuries associated with inadequate

housing, management, and equipment (Visser et al, 2014; Popescu et al, 2019). The aim of the paper was to assess the welfare of two horse category (breeding and working horses) based on health indicators.

MATERIAL AND METHOD

This study evaluated 90 horses from various categories and husbandry systems. The research was conducted over a two-year period. The two main categories of animals investigated included breeding horses (n=50) from state stud farms and working horses (n=40) from the private sector. The horses kept in the studfarm were Lipizzaner and Romanian Draft horse breeds. The private working horses were of varying age categories and genders.The welfare assessment was performed based on health-related parameters by the methods described by Popescu & Diugan, 2013 (Table 1).

Table 1

Health-related parameters evaluated in breeding and working horses

Parameter	Assessment method	Score
Hair coat condition	Inspection and palpation of the hair coat, all over the animal's body	0 = severely affected hair coat, generalized or multifocal alopecia, over extensive areas 1 = abnormal hair coat, as above, but focal alopecia on limited body areas 2 = dull hair coat 3 = normal hair coat: shiny, uniform, clean
Hair quality in the mane/tail	Mane/tail inspection or/and palpation	0 = abnormal mane/tail: diffuse hair removal and alopecia, broken or displaced hairs and / or affected skin 1 = normal tail/mane: hair intact, shiny in mane and tail
Body lesions	Inspection and palpation	0 = severe, deep lesions 1 = superficial lesions: which does not require surgery 2 = scars (fibrous tissue not covered by hair) 3 = absence of lesions
Lameness	Visual, assessed in the horse walked for at least 10 m on even terrain and turned in both directions	0 = severe (obvious lameness when walking, with the possibility of identifying the limb that is lame) 1 = mild (identification of lame limb requires observation longer than three steps) 2 = no lameness (normal walking)
Gait	Visual, assessed in the horse walked for at least 10 m on even terrain and turned in both directions	0 = yes (any gait abnormality other than lameness, such as loss of balance, limping, uneven gait, hyperflexion) 1 = no
Lower leg lesions	Visual and palpatory, assessed below the knees and hocks	0=deep lesions 1=superficial lesions, without complete penetration of the skin 2=scars (fibrous tissue not covered by hair) 3=the absence of lesions
Swollen tendons/joints	Inspection and palpation of the swollen tendons/joints	0 – swollen tendons and joints: at least one joint and one tendon visibly swollen or palpable, so that ligaments, tendons and joints can no longer be distinguished 1 – swollen tendons or joints: at least one tendon or joint visibly swollen and / or palpable 2 – absence of swellings in tendons or joints
Hoof walls too long or too short	Visual inspection of the hoof walls	0 = too long 1 = too short 2 = proper length
Hoof horn quality	Visual, looking from above, without uplifting the feet, previously washed as needed	0 = abnormal, with interruptions, rough surface 1= normal hoof horn
Horseshoes	The presence/absence of horseshoes is observed	0 = missing horseshoe (accidental condition on one or more limbs) 1 = without horseshoes 2 = with horseshoes
Dyspnea	Inspection of the horse's flank and nostrils at rest, at least 20 minutes after intense effort	0 = presence of dyspnea 1 = normal breathing
Cough	Auditory, assessed to record any cough over the whole assessment	0 = presence of repeated cough 1= presence of unique cough 2 = absence of cough
Nasal discharge	The area of the nostrils, consistency and appearance of nasal discharge are observed	0 = mucous/purulent nasal discharge 1 = serous nasal discharge 2 = no discharge

Parameter	Assessment method	Score
Ocular discharge	Inspection of the eyes and periocular region, consistency and appearance of ocular discharge are observed	0 = purulent ocular discharge 1 = serous ocular discharge 2 = no discharge
Diarrhea	Visual inspection, assessed on the medial and/or caudal aspect of the hind legs for any fecal soiling	0 = presence 1 = absence
Dental check	In accordance with the owner's responses to the questionnaire	1 = yes 0 = no
Vision	Inspection and evaluation of the palpebral reflex	0 = absence 1 = presence

Each horse was assessed by two assessors. The data were analyzed using the SPSS statistical software (version 17). Comparisons between breeding and working horses were made with the Kruskal-Wallis test, as the data did not follow a normal distribution. Differences were considered significant if $P < 0.05$.

RESULTS AND DISCUSSIONS

In our study, the prevalence of the normal hair coat condition was lower in breeding horses than in working horses, with no significant differences ($P>0.05$) between categories (table 2). The normal quality of the mane and tail hair was more frequent in both categories of horses than the normal hair coat. Although the overall appearance of the hair is closely related to the animal's systemic health, partial damage can also be a result of management factors or behavioural manifestations. The lesions, both those on the body and those on the distal parts of the limbs, were significantly ($P<0.05$) more frequent in working horses than in those used for reproduction (Table 2). The risks of welfare issues vary depending on the horse's use, even though it's challenging to determine which specific problems most affect the horse's welfare in terms of their subjective experiences (Burn et al., 2010a).

Tendon and/or joint swellings were more common in working horses compared to breeding horses. Work use, especially heavy traction, demands both the bone and joint structure as well as the ligaments and tendons of the horses. In addition, there is a possibility of limb injuries during work. In the study published by Pritchard et al, 2005, tendon and joint swellings in working equines from developing countries were present in over 75% of the observed equines. In Romania, researchers reported similar percentages to those obtained in this study (Popescu & Diugan, 2013, 2017; Popescu et al, 2019).

There were no significant differences ($P>0.05$) between the proportion of working horses and breeding horses that exhibited lameness. In this study, severe lameness was only identified in working horses, with a much lower prevalence compared to other studies (Biswas et al, 2013; Popescu et al, 2016; Sanmartin Sanchez et al, 2020). According to several studies, lameness is the most common issue affecting horses and ponies (Kane et al, 2000; Broster et al, 2009; NEHS, 2013).

Lameness causes suffering due to pain (Whay et al, 2005) and affects the animal's well-being. In general, mild lameness symptoms can go unnoticed by the assessor. Even for experienced veterinarians, the assessment of lameness is subjective and not always definitive (Keegan et al, 2010). Regarding horse owners, their diagnosis of lameness is often even less accurate. However, as with other animal welfare issues, recognizing lameness in horses, especially working horses, is the first step in prevention and prompt treatment, as outlined in the Five Freedoms of the animals. Therefore, it is important for all those involved in the equine industry to have knowledge and experience in determining whether a horse is healthy or lame. Regarding the uneven gait, the differences observed were significantly ($P<0.05$) more common in working horses. Using several indicators, hoof health was evaluated (Table 1). The identification of hoof problems was considered necessary because some authors (Wilson, 2002; Popescu et al, 2014) argue that a significant proportion of lameness issues, especially in working horses, is based at hooves level.

Table 2

Prevalence of evaluated indicators in breeding and working horses

Parameters	% (No. animals)		P
	Breeding horses	Working horses	
Hair coat condition			
severely affected hair coat	10 (5)	2.5 (1)	0.129
abnormal hair coat	0 (0)	2.5 (1)	
dull hair coat	50 (25)	40 (16)	
normal hair coat	40 (20)	55 (22)	
Hair quality in the mane/tail			
abnormal	46 (23)	37.5 (15)	0.57
normal	54 (27)	62.5 (25)	
Body lesions			
deep lesions	2 (1)	0 (0)	0.032
superficial lesions	12 (6)	12.5 (5)	
scars	20 (10)	50 (20)	
absence of lesions	68 (33)	37.5 (15)	
Lameness			
severe lameness	0 (0)	10 (4)	0.204
mild	30 (15)	30 (12)	
no lameness	70 (35)	60 (24)	
Gait			
uneven walking	8 (4)	22.5 (9)	0.05
Lower leg lesions			
deep lesions	0 (0)	10 (4)	<0.001
superficial lesions	16 (8)	55 (22)	
scars	12 (6)	35 (14)	
absence of lesions	72 (36)	0 (0)	
Swollen tendons/joints			
presence	10 (5)	27.5 (11)	0,005
absence	90 (45)	72.5 (29)	
Hoof walls too long or too short			
too long	36 (18)	42.5 (17)	0.14
too short	10 (5)	25 (10)	
proper length	54 (27)	32.5 (13)	
Hoof horn quality			
abnormal	42 (21)	20 (8)	0.027
normal	58 (29)	80 (32)	
Horseshoes			
missing	6 (3)	15 (6)	0.160
with/without	94 (47)	85 (34)	
Dyspnea			
presence	6 (3)	22.5 (9)	0.023
absence	94 (47)	77.5 (31)	
Cough			
repeated	0 (0)	10 (4)	0.076
unique	32 (16)	37.5 (15)	
absence	68 (34)	52.5 (21)	
Nasal discharge			
purulent nasal discharge	0 (0)	0 (0)	0.048
serous nasal discharge	2 (1)	12.5 (5)	
no discharge	98 (49)	87.5(35)	
Ocular discharge			
purulent ocular discharge	2 (1)	2.5 (1)	0.927
serous ocular discharge	24 (12)	22.5 (9)	
no discharge	74 (37)	75 (30)	
Diarrhea			
presence	6 (3)	15 (6)	<0.001
absence	94 (47)	85 (34)	
Dental check			
checked	30 (15)	12.5 (5)	0.048
unchecked	70 (35)	87.5 (35)	
Vision			
presence	96 (48)	90 (36)	0.836
absence	4 (2)	10 (4)	

$P < 0.05$ - the difference is statistically significant

Many of these are caused by incorrect hoof horn trimming and improper shoeing. The manner and frequency of hoof adjustment, as well as its routine cleaning and care, influence all indicators of hoof health evaluated in the study (quality of hoof wall and sole surface, shape and length of the hoof). The results indicate incorrect hoof length (too long or too short) as the most frequently detected problem within this group of indicators. Similar results have been reported in other studies (Pritchard et al, 2005; Tadich et al, 2008; Fröhlich et al, 2020).

From the perspective of this study, both properly shod horses and those unshod but with correctly trimmed hooves were considered to be in good welfare. On the other hand, those that were accidentally unshod or had extremely worn hooves, as well as those improperly shod, were classified as having welfare issues. In countries where proper attention is given to horseshoeing, losing a horseshoe is considered an urgent matter, and it is recommended to immediately stop the horse, protect the sole surface and the lower edge of the hoof, and address the issue as quickly as possible. In terms of promoting care for horses' hoof health and avoiding welfare problems, possible solutions involve informing and educating owners and, in addition, training farriers who can apply a solid knowledge base in practice.

The indicators of the presence or absence of dyspnea, coughing, and nasal discharge served to assess the health of the respiratory system. In the working horse category, the proportion of animals displaying these symptoms was higher than in the breeding horse category, even though the differences were significant only for dyspnea and nasal discharge ($P < 0.05$). One of the common respiratory system illnesses that horses are frequently susceptible to is a form of allergic inflammation of the airways called Recurrent Airway Obstruction (RAO), which involves a complex interaction of genetic and environmental factors (Moran & Folch, 2011). An important risk factor for the development of this disease is exposure to specific airborne allergens and irritants, such as ammonia, molds, and inhalable dust particles in shelters, especially in the absence of adequate ventilation. Among all categories of horses evaluated, the stallions spent the most time indoors. However, the construction of the shelters (tall structures with intake and exhaust vents), as well as the continuous removal of manure, represented means to avoid the accumulation of noxious gases and inhalable solid particles in the air at the breathing level of the sheltered horses. The presence of ocular secretions and even the absence of vision in one or both eyes did not present unusual aspects, neither in terms of prevalence nor in terms of significant differences between the evaluated animals. The results obtained are similar to those reported by Lazar, 2014. In a study conducted in India (Biswas et al, 2013), a prevalence of 49% of working equines with eye abnormalities was identified, although the nature of these abnormalities was not explained. The authors suggest that the high frequency of eye problems may be related to pollution, exposure to dust during work, inadequate feeding, and improper management of flying insects.

Regarding the prevalence of diarrhea, values between 6 and 15% have been reported. Other studies have presented data ranging from 0% (Tadich et al, 2008; Popescu et al, 2019) to 19.4% (Pritchard et al, 2005; Popescu & Diugan, 2013). Information regarding the dental checking of the horses was provided by owners through a questionnaire. The data show that the number of horses whose teeth have been checked at least once in their lifetime is low, but it is still encouraging to find that this was the case within each evaluated category.

CONCLUSIONS

Working horses had more welfare problems compared to breeding horses, especially body injuries, limb and gait problems, respiratory disorders and diarrhoea. Most of these, with the exception of the chronic ones, can be prevented or remedied by interventions on the horses' living environment. In breeding horses, the most significant welfare problems were hoof horn conditions.

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