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Assessment of Factors for External Injuries and Welfare Problems of Equine in South Wollo Zone Amhara Region, Ethiopia

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ABSTRACT

A cross-sectional study was carried out in selected districts of South Wollo zone of the Amhara Region, Ethiopia during the period between April 2013 and December, 2013 to identify the major factors associated with external injuries in equines. Moreover, 180 randomly selected farmers were interviewed to collect relevant data on equine management and welfare issues. 586 working equines (346 donkeys and 240 mules) were examined clinically for screening injuries on body parts. Among the equines, 95.9% donkeys and 80.8% mules were used as pack animals. 63%, 27% and 9.8% of donkeys and 35%, 56.7% and 8.3% of mules were in thin, medium and good body condition score, respectively. The study revealed 66.6% overall prevalence of external injuries. The incidence of external injury in these animals was independent of age and species. Injuries caused by improper harness (saddle) design and overload were more common in both donkeys and mules. Injuries were most common in the back (31.8%), brisket region (12.3%), flank (10.8%) and tail base (6.2%). Out of a total of 108 interviewed farmers, 13.8% did not provide any treatment to their equines and 33.4% used their equine continuously regardless of the presence and severity of injures. In general, improper harnessing, overloading and ill-fitted saddle design were the major causes of external injuries in working equines of the area. The study disclosed higher prevalence of external injuries and absence of proper management of working donkeys and mules in south Wollo zone. Thus, a comprehensive equine health and welfare promotion program should be taken without any delay to alleviate the existing problems in the near future.

Keywords: *Equine, injuries, welfare, Ethiopia*

Equine population in the world is estimated to be 90 million, of which 80% are found in developing countries like Asia and Africa (Wilson, 2002). The majority of these animals are owned by individuals who use them as their sole source of income to sustain their large and extended families (Pritchard *et al.* 2005). Indeed, research suggests that working animals supply approximately 50% of agricultural power needs globally (Swann, 2006). In Ethiopia, there are an estimated 6.2 million donkeys, 2 million horses and 0.38 million mules (CSA, 2011). Equine populations play a vital role in both economic as well as social functions in different agro-ecological zones of the country. They are kept and are often used for land tillage, cultivation, threshing, riding as well as for pack purposes (Belay 2005). Equines will remain as the main means of transport animals in the coming decades also, especially in the marginal lands of Ethiopia. This is because the mountainous and rugged feature of the country causes difficulty in motor road construction. Moreover insufficient infrastructure due to prevailing low economic status of the community further adds to the problem (Mengistu 2003).

Over the past two decades, equine welfare is a topic that has attracted significant interest from both scientists and society in general. Even though, equines provide several advantages to the farming communities, little attention has been made in the past to study the health and welfare of these hard working animals and remain still neglected and left to the mercy of nature. This is because the government livestock development programme and those of aid agencies mainly focus towards increasing meat, milk, egg and wool production (Yoseph *et al.* 2001).Prevention of cruelty to Animals Act 1960 has set up some guidelines which are not being followed. In Ethiopia, there is usually only one qualified government veterinarian (with no training

in equine medicine) in a district based clinic typically covering 40 villages (The Brooke 2007). Feed shortage, disease and external injuries are the major constraints to productivity and work performance of equines in Ethiopia. They are brutally treated, made to work overtime without adequate feed or health care (Mengistu 2003) This misuse, improper treatment and lack of veterinary care for equines have contributed enormously to early death, majority of which currently have working life expectancy of 4 to 6 years as compared to 30 years in developed countries (Fred and Pascal 2006).

Due to paucity of information regarding the magnitude and the factors associated to external injuries and welfare of equines, the present study was undertaken to estimate the magnitude of welfare problems and the major factors leading to external injuries in working equids in South Wollo zone Amhara region.

MATERIALS AND METHODS

Study area

The study was carried out in Kutaber, Dessie Zuria and Tehuledere districts of South Wollo zone of the Amhara region in Ethiopia. The area is located at a distance of 400 kms north of the country capital, Addis Ababa with an altitude between 2200 to 2600 meters above sea level. The area experienced a bimodal rain fall pattern with a short rainy season from February to March and the long rainy season from the middle of June to the end of September. The remaining months are dry periods. The area gets an annual rain fall of 850-1100 mm and the mean annual maximum and minimum temperature are about 21^{o}C and 7^{o}C respectively. According to Central statistical agency (2011), the population of equines in the South Wollo is 758437. Crop-livestock farming is the main farming system of the area and equines are the third dominant species next to sheep and cattle. Most agricultural products are often transported by equines' power.

Study design and animals

The study was cross sectional with simple random sampling technique. 586 working equines (346 donkeys and 240 mules) found in market and on grazing lands were taken as sample animals. Horses were not included in the study because only 16 of these were observed during the study time and may have caused biased data. Age of the animals was determined from birth records (from owners) and dentition characteristics and were categorized as young (5≤ years), adult (>5 ≤10 years) and old (> 10 years) (Payne, 1990). Scoring of body condition was conducted based on the criteria described by Carroll and Huntington as cited by pitchard *et al.* (2005) and categorized as thin (body condition score 0,1, and 3), medium (body condition score 3) and good (body condition score 4 and 5).

Data collection

Animals were examined physically, and any grossly visible injuries were characterized and their causes were identified by asking their owners. Injuries were classified into severe, moderate and mild on the basis of clinical examination of these animals.

Questionnaire survey

A semi-structured questionnaire was administered to 108 randomly selected respondents from different villages of the study area to obtain informations related to injury management, fate of injured animals, type of work carried out by equines, equine ownership, purpose of equine rearing, management of injured animal and knowledge about equine welfare.

Data analysis

The collected raw data were organized and arranged using the Microsoft Excel spread sheet computer programme and analyzed using SPSS 20.0 soft ware version. Relative frequency (RF) of a specific category of a given factor was computed as the proportion of cases out of the total cases. Factors related to occurrence of injuries were investigated using chi-square test and level of significance was considered at $P<0.05$.

RESULTS AND DISCUSSION

The aim of this study was to address general health and welfare problems of equines in South Wollo Zone, Ethiopia. From a total of 586 examined equines, 55.3% were between 5 and10 years of age. This finding contradicts with the observations of Fred and Pascal (2006) who reported that

life expectancy of the majority of equines in developing countries is not more than six years. This variation might be due to variation in environment condition, nutritional status, and moreover the health services given to the animals. The present study also disclosed that large proportion of donkeys (95.9%) and Mules (80.8%) were used for pack types of work that included transportation of agricultural products. Only19.2% mules and none of the donkeys were used for riding. Almost similar findings were reported by Satessa and Lema (2014), Solomon and Rahimeto (2010) and Dinka *et al*. (2006*)* in different parts of Ethiopia and in India (Biswas *et al.* 2006).

Table 1: Species of working equines, work types, age group and body condition score proportion

Factor	No. of equines observed	Body condition score category proportion		
		1	2	3
Species				
Donkey	346	63.0%	27.0%	9.8%
Mule	240	35.0%	56.7%	8.3%
Age group				
≤5 years	86	60.5%	30.2%	9.3%
5-10 years	324	49.4%	41.3%	9.3%
>10 years	176	51.1%	39.8%	9.1%
Work types				
Pack	526	51.3%	39.4%	9.1%
Riding	46	47.8%	43.5%	8.7%
Others	14	71.4%	14.3%	14.3%

The observation of body condition status in relation to species, age and work type in donkeys and mules were further scrutinized. Accordingly, 60% donkeys and 35% mules were found with poor body condition score whereas only 9.8% and 8.3% donkeys and mules were in good body condition, respectively (Table 1). These figures were quite higher than the earlier findings of Mekuria *et al*. (20013) and Solomon and Rahimeto (2010) in different parts of Ethiopia who reported poor body condition 10.88% and 26.2%, respectively among equines. The study also disclosed a 66.6% of overall prevalence of external injuries in working equines in South Wollo zone (Table 2). The finding almost concurs with the prevalence of 72.1% reported by Biffa and Woldemeskel (2006) in Hawasa, Ethiopia, however lower prevalence of 44% was observed in central Ethiopia (Pearson *et al*. 2000). This difference might be due to variation in climate, nutrition, management and health care facilities. Moreover there was no significant difference in the prevalence of external injuries with respect to the species (χ^2=0.579; p>0.05) and age of animals (χ^2=1.049; p>0.05), which indicates that both species at all age groups were equally susceptible to external injuries (Table 2).

Table 2: Prevalence of external injuries by species and age categories

Factors	No. Examined	No. injured	Prevalence %	χ^2	p-value
Species					
Donkey	346	226	65.3		
Mule	240	164	68.3	0.579	0.447
Total	586	390	66.6		
Age					
≤5years	86	58	67.4		
5-10 years	324	211	65.1	1.049	0.592
>10 years	176	121	68.75		

Among different causes of injuries in equines, improper harness (saddle) and overload (Table 3) were the most common, which is in agreement with the findings of Sisay (2013) and Pearson *et al*. (2000*)* in north and central Ethiopia, respectively. This similarity might be due to the fact that equine owners used similar saddle and plastic harnessing materials. As shown in Table 4, Donkeys were at about two times severely injured (6.4%) than mules (3.3%). This might be attributed to the fact that the society considers donkeys as tolerant animals and are more frequently used in agriculture practices than mules without giving any health care services. Similarly, the injuries were most predominant on the backside of both the animals (donkeys 28.3% and mules 36.6%) as compared to their other parts of the body as shown in Table 5. Similar findings were reported previously in different parts of Ethiopia (Yilma *et al.*1991; Pearson *et al.*2000; Bifaa and Weldemeskel, 2006; Mekuria *et al.*2013; Sisay, 2013) and in Kenya (Fred and Pascal, 2006). This might be due to the fact that equines were made to carry heavy loads over long distances and even loaded without saddle. Moreover, harnesses were poorly designed and ill -fitted saddle put on the back were strongly tied to their body by a plastic rope that caused persistent irritation and injuries to the animals.

When working equines can no longer work, the owners lose their livelihoods, either temporarily or permanently. Therefore the welfare of working equines in developing country like Ethiopia is therefore crucially important, not only for the health and survival of those animals, but also for the livelihood of those people dependant on them (Pearson and Krecek, 2006; Wilson, 2002).

Table 3: Causes of external injuries in Donkeys (n=346) and Mules(240) in the study area

Causes of external injuries	Donkeys No. (%)	Mules No. (%)	All Equines (%)
Improper harness and saddle	126 (36.4%)	98(40.8%)	38.3
Over load	48(13.9 %)	38(15.8%)	14.7
Sharp object piercing	26(7.5%)	14(5.8%)	6.8
Infectious disease	4(1.2%)	4(1.7%)	1.4
Biting	18(5.2%)	6(2.5%)	4.1
Cauterization	4(1.2%)	4(1.7%)	1.4

Table 4: Severity of external injuries associated with species

Species	No. of animal Examined	Severity of injuries		
		Mild	Moderate	Severe
Donkeys	346	34.1%	24.8%	6.4%
Mules	240	45%	20%)	3.3%
Total	586	35.7	22.9%	5.1%

Table 5: Distributions of lesions on various body parts of examined equines

Injured parts	Donkeys, n (%)	Mules, n (%)	Total, n (%)
Head	4 (1.8)	4 (2.4)	8 (2.1)
Ear	2 (0.9)	6 (3.7)	8 (2.1)
Neck	9 (3.9)	7 (4.3)	16 (4.1)
Mouth	4 (1.8)	69 (3.7)	10 (2.6)
Wither	35 (15.5)	21 (12.8)	56 (14.4)
Shoulder neck	5 (2.2)	1 (0.6)	6 (1.5)
Back	64 (28.3)	60 (36.6)	124 (31.8)
Flank	26 (11.5)	16 (9.8)	42 (10.8)
Front leg	9 (3.9)	7 (4.3)	16 (4.1)
abdomen	4 (1.8)	4 (2.4)	8 (2.1)
Hind leg	14 (6.2)	10 (6.1)	24 (6.2)
Under Tail	16 (7.1)	8 (4.9)	24 (6.2)
Brisket region	34 (15.1)	14 (8.5)	48 (12.3
Total	226	164	390

A total of 108 farmers were interviewed, based on their willingness to participate in the survey. The owners revealed that 91.5% respondents had at least one equine, whereas only 8.5% had no any equine at all. The result indicated that equines have an important role in the livelihood of subsistence farmers in the area. A significant proportion (13.8%) of equine owners did not provide any treatment to their donkeys or mules and 33.4% reported that they used injured animal continuously regardless of the severity of injuries as shown in Table 6. Only 12.9% of the respondents gave long term rest till complete recovery. Similar situations have been reported in the other parts of country where only a few people look for the veterinary advice regarding the treatment of injured equines and give enough rest to their injured animals (Pearson *et al.* 2000; Sisay, 2013). This indicates the widely prevailing equine welfare problem in the area.

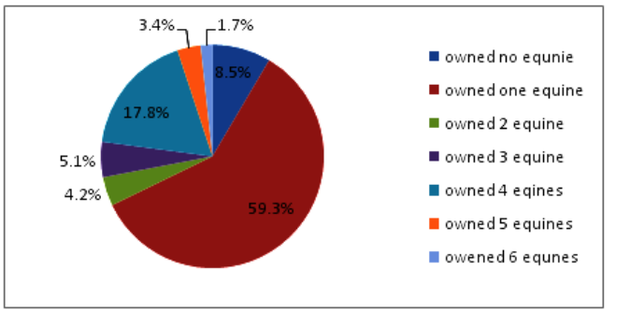

Fig. 1: The proportion of equine ownership in the study area

Table 6: Owners response to the management of injured equine

Factors	n=108	
Management of external injuries	No respondents	Percentage
Take to nearby vet clinic	48	44.5
Treat with herbal medicine them self	16	14.8
Treat with medicament purchased from local market	17	15.7

Take to local healer	12	11.2
Do nothing	15	13.8
Fate of injured equines		
Use the animal continuously regardless of the severity of injuries	36	33.4
Give long term rest until recovery	14	12.9
Give short term rest	58	53.7

The results of this study indicated that many of the equines working in the area were experiencing multiple welfare problems. Majority of the equids in the south wollo zone had external injuries and a large proportion of sick equids were continuously used for work, without providing any rest or treatment indicating lack of proper management and attention being paid to these animals. It is hence imperative that a comprehensive equine health and welfare promotion program should be undertaken without delay in near future to alleviate the existing problems.

Further investigations on the risk factors associated with equid welfare are warranted as to improve the situation of these working animals.

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