



Assessment of Welfare and Health Conditions on Working Donkeys in Humbo District in Wolaita Zone, Southern Ethiopia



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Abstract

Donkeys are important animals to the resource of poor communities in Ethiopia, providing packing, traction power and transport services. A cross-sectional study was carried out from December 2023 to August 2023 to investigate the health and welfare problems of working donkeys in selected kebeles of Humbo district in Wolaita zone of southern Ethiopia. A total of 384 donkeys were selected for this study and a simple random sampling method was employed to select study donkeys from selected kebeles. Donkeys for this study were selected regardless of sex, work type, body condition and age. The study revealed a total prevalence of health problems among working donkeys in the study area was found to be 59.8 % (230/384); so that at least one problem was observed in each positive donkeys. Out of the total investigated animals during the study period, 28.26% of animals were seen with different kinds of simple to complex wounds; 21.3% of animals a musculoskeletal problem; 8.26% of animals were observed with eye problems, 11.3% were seen with different forms of infectious diseases signs, about 8.7% seen with dental problems; and about 22.17% of animals shown skin problems. During this study sex, and body condition score showed significant association ($P < 0.05$) with prevalence of common health problems in donkeys; and age and treatment history haven't shown association ($P > 0.05$) with health problems. Diseases, lack of adequate feed and water, work overload, improper harnessing and Traumatic damage due to different factors were the encountered factors that compromise the welfare of working donkeys in study area. Therefore, to reduce health problems and improve the welfare status of animals, awareness creation of the population about the use of these animals for working should be promoted by the government through delivering mass education and extension program, training and advice services in the area to ensure better management practices, and hence productivity of the animals.

Keywords: Assessment; Humbo; Donkey; Health; Welfare

Introduction

Working donkeys, horses and mules make up approximately 112 million of the global livestock population in less developed countries. They support people's livelihoods in a wide range of sectors including agriculture, construction, tourism, mining, and public transport. It is estimated that working equine animals help approximately 600 million people globally, very often in the poor and marginalized communities [1]. Donkeys are an important farm animal species that descended from the African wild-ass (*Equus africanus asinus*) and early domesticated equines that have been around as long as mankind, [2]. There are approximately 43 million donkeys in the world. Most of them contribute to developing countries' livelihoods, both directly and indirectly [3]. The use of donkeys for transport in Africa dates to famous or important historic times. This contrasts with the situation in many African farming systems, where farmers have only recently

started to use donkeys because of changes in land use patterns, agro-ecological conditions and labor availability [4].

Ethiopia has approximately 10.80 million donkeys, the largest population in Africa and the second largest in the world. Nearly 47% of the country's total donkey population is male [5]. Although working donkeys are found in all the ecological zones of the country (arid to mountain), the majority are found in the highlands and are primarily used as pack animals and providing traction power and transport services at low cost. The use of donkeys in door-to-door transport service also provides urban dwellers with the opportunity of income generation [6].

Working donkeys are typically utilized for several roles unlike other working equids and are consequently seen as more 'multipurpose' animals [7]. They transport goods to and from

markets, farms, and shops, travelling long distances. They also pull carts carrying heavy loads. They work from 4 to 12 hours/day, depending on the season and type of work [8].

Despite the contribution of donkeys to human livelihoods, some welfare issues have been reported in working donkeys. In Africa, harsh environmental conditions, overuse, improper tools, limited veterinary awareness and little or poor-quality supplementary feed during dry periods can lead to advanced welfare problems. Unlike horses, working donkeys are not provided with sufficient feed supplements [9]. Feed shortage and disease are the major constraints to productivity and work performance of equines. Donkeys suffer from poor body condition, sores and wounds, lameness, ticks and gastrointestinal parasites, dehydration, and aggressive or apathetic behavior, all typically linked to human job demands and the environment [3].

Welfare is about being healthy and having what is needed both physically and mentally just like human's animals need: sufficient feed and water, an appropriate environment including shelter and a comfortable resting area rapid treatment when sick, injured or in pain, sufficient space and the company of their own kind conditions and treatments that avoid mental suffering. These all are called the five freedoms [6]. Farm animal welfare concern is limited in developing countries compared to developed nations. The farm animal welfare concerns can be seen from viewpoints they are kept and management practices, mainly in systems where animals are kept in confinement for most of their lives, feeding methods, health care situations, and expression of their normal behaviors [10].

Consideration of both health and behaviour is important when assessing welfare. Generally, two methods are used for the assessment of equine welfare which includes direct observation and scoring system and record-based observation system. [11]. Behavioural observations used in farm animals include social behaviour, comfort behaviour and standardized fear tests to measure the human-animal relationship. Physical observations of relevance to equines include body condition, hoof horn quality and skin turgor as an indicator of hydration status. Dehydration and hyperthermia are also major welfare threats to working equines in developing countries, where work continues in extreme temperatures [12].

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 [13]. The prevalence of health problems can differ between species, for example donkeys have significantly higher prevalence of gait and sole abnormalities than horses and mules. Working donkeys also suffer from animal welfare problems such as gait abnormalities, tendon and joint swellings, skin lesions, ectoparasites, lip lesions, tether and hobbling lesion and dental problems. Diseases are another problem for the donkeys and can also cause economic defeats for the owners. Diseases that are a problem for donkeys are worms,

external parasites, rabies, anthrax; skin tumours, pneumonia and hoof rot [14].

In rural and peri-urban areas, people rely on equines to transport crops, fuel wood, water, building materials and people by carts or on their back from farms and/or markets to home. Animals are often engaged in work for long hours and when get free, they are left to browse and feed on garbage [15]. This misuse, mistreatment 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 [16].

Due to the increasing population and the undeveloped infrastructure the demand for working donkeys will most likely increase. It will still take many years to develop the infrastructure in Ethiopia due to the characteristics of the terrain and the low economic status of the country [14]. Though Donkeys provide invaluable support for the livelihoods of communities in the Humbo woreda; however, scarcity of documented information regarding donkey welfare issues and health status.

Therefore, the objectives this study were

- To investigate major welfare and health problems in donkeys
- To assess the risk factors associated with occurrence of major health problems

Materials and Methods

Study area

The study was carried out in Humbo Woreda, Wolaita zone, Southern Ethiopia. The district is located 408 km (to the south) from Addis Ababa. It is located 18 km south of Sodo, the administrative center of the Wolaita Zone. Geographically, it is located at 60 43'44 N latitude and 370 45'51"E longitude with an altitudinal range between 1500-2500m meter above sea level. The agro-ecology of the study Woreda consists of 70 percent lowland or Kola and 30 percent intermediate highland or Woina Dega. The mean annual temperature is 220C. The rainfall is erratic with an annual average ranging from 843 to 1403 mm. The land escape is characterized by hilly terrain traversed by large plains, valleys and gorges [17].

Study Design and Study Animals

A cross-sectional study was carried out from December 2023 to August 2023 to investigate the welfare status of working donkeys found in purposively selected kebeles of Humb woreda in Wolaita zone of southern Ethiopia.

Donkeys for this study were selected regardless of sex, work type, load type, body condition and age. The age of the selected working donkeys was determined according to owner's information and the dentition pattern as described by Crane and Svendsen [18]; hence classified as young, adult and old. The body condition of animals is also characterized according to Svendsen [19] as good, medium and poor body condition scores.

Sampling Method and Sample Size Determination

A simple random sampling method was employed to select study donkeys from purposively selected kebeles. The sample size for this study was determined by the formula described by Thrusfield [20]. Accordingly, at 95% confidence level and precision of 5% the total sample size was determined to be 384 since there was no research carried out on the title previously in the study area. So, for this study the sample size was as following:

Data Collection

Observations

The health status of the donkeys was assessed by examining each donkey, so that at least one problem was observed in each positive donkey. The donkeys' environment and living conditions were assessed through observations using a resource and management-based protocol. Parameters included were access to water, feed and shade. If they had access to water the cleanliness of the water was assessed and if the donkeys had access to feed, the type of feed was described. If the donkeys were working during the observation, harness and equipment were assessed as the way of loading the donkeys. Weather, the estimated ambient temperature and the time of the day for the assessment were noted.

Welfare Assessment

Data collection format for direct assessment was developed and data were collected by direct physical examination of the equine. Information regarding general body condition such as wound type, dermatological disease, musculo-skeletal disease, other disease signs and behavior, age categories, body condition score, work type and condition of harnessing were properly recorded on data collection format according to Pritchard et al [21].

Data Analysis

The data collated according to species, age, sex and work type and was recorded by hand and results (Welfare and health parameter) will be inserted into MS- excel spread sheet program to create a data base and will be transferred to the STATA software version 14 program and analyzed by using descriptive statistical. The relationship between different sets of categorical data was examined using the Pearson Chi square.

Results

The prevalence of major health problems encountered in the study area

The present study revealed a total prevalence of health problems among working donkeys in the study area was found to be 59.8 % (230/384). The health status of the donkeys was assessed by examining each donkey, so that at least one problem was observed in each positive donkey. As Indicated in below table (table 1); out of the total investigated animals during the

study period, 65 (28.26%) of animals were seen with different kinds of simple to complex wounds; in 49 (21.3%) of animals a musculoskeletal problems like deformities in hoof, legs and different degrees of lameness seen; 19 (8.26%) of animals were observed with eye problems such as; lacrimation, traumatic injury, laceration, opacity, and unilateral blindness. Among the examined donkeys, 26(11.3%) were seen with different forms of infectious diseases signs, and 20 (8.7%) seen with dental problems; and about 51 (22.17%) of animals shown skin problems such as skin infections, external parasites, wart and other form of lesions.

Association of major health problems with different risk factors

During this study sex, age, body condition score, and treatment history were considered as putative risk factors and assessed for their association with the prevalence of major health problems in working donkeys. Among these risk factors based on sex-based assessment as indicated in below table (table-2), 210/339 (61.9%) of Male donkeys shown problems and 20/45 (44.4%) and female donkeys manifested different health problems with p-value = (0.024) indicated a significant association of sex with prevalence of health problems in equines.

Age based assessment has revealed that young's 47/76 (61.8%), adult donkeys 116/185 (62.7%) and old animals 67/123 (54.4%) showed some of major health problems respectively as shown in table 3.

Based on Body condition score assessment animals with good body condition shown 54.4% (67/123) health Problems; Animals with medium body conditioned animals has shown 66.9% (103/154) health problems, and 62.8% (66/105) poor body conditioned animals showed major health problems with P- value of 0.000 as indicated in table 4.

Assessment of treatment history revealed that 53.8% (164/281) of animals showed major health problems, were animals that have treatment and vaccination history before; and 64.1% (66/103) of animals that manifested health problems were never treated before which was found statistically non-significant as indicated in table 5.

Major factors compromising welfare of donkeys

The major causes and factors compromising welfare of donkeys in study area were obtained by interviewing 50 donkey owners and 10 animal health workers. Diseases were a major problem (35%) related to health of donkey in the study area, followed by improper use of harnessing materials (23.3%) which led animals to work related wound. Lack of adequate feed and water (13.3%) is also taken as one of the predisposing factors for different health problems which compromise welfare in equines. Overloading donkeys (10%) and damage caused by falling and other animal bite also the factors for health problems of equines in the study area as indicated in table 6.

Table 1: Prevalence of major health problems encountered in the study area.

No	Major health Problems	No. of animals examined	No. of animals affected	Percentage (%)
1	Different type of wounds	384	65	28.26
2	Musculoskeletal system problems	384	49	21.3
3	Eye problems	384	19	8.26
4	Infectious diseases	384	26	11.3
5	Dental problems	384	20	8.7
6	Skin problems	384	51	22.17
	Total	384	230	59.8

Table 2: Association of sex with the prevalence of major health problems.

Variables		No. Examined	No. affected	%Prevalence	P-Value
Sex	Male	339	210	61.9	0.024
	Female	45	20	44.4	
Total		384	230	59.8	

Table 3: Association of age with the prevalence of major health problems.

Variables	Categories	No. Examined	No. affected	% Prevalence	P-Value
Age	Young	76	47	61.8	0.65
	Adult	185	116	62.7	
	Old	123	67	54.4	
Total		384	230	59.8	

Table 4: Association of body condition with the prevalence of major health problems.

Variables	Categories	No. Examined	No. affected	% Prevalence	P-Value
BCS	Good	125	61	48.8	0
	Medium	154	103	66.9	
	Poor	105	66	62.8	
Total		384	230	59.8	

Table 5: Association of treatment history with the prevalence of major health problems.

Variables	Categories	No. Examined	No. affected	% Prevalence	P-Value
Treatment history	Treated before	281	164	53.8	0.353
	Never treated	103	66	64.1	
Total		384	230	59.8	

Table 6. Major causes and factors compromising the welfare of donkeys.

No	Major causes	Frequency	Percentage (%)
1	Diseases	21	35
2	Lack of adequate feed and water	8	13.3
3	Related to work overload	6	10
4	Improper harnessing	14	23.3
5	Traumatic damage due to different factors	9	15
	Total	60	100

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Discussion

Donkeys are important animals providing traction power, transport services at low cost and source of income generation for resource poor farmers in the study area. This study showed that different health problems were manifested in working donkeys with an overall prevalence of 59.8%, so that at least one problem was manifested in positively diagnosed animals. Different types of wounds, skin lesions, musculoskeletal system problems, infectious diseases, eye problems and dental problems were the most occurred health problems in the study area with their proportion of occurrence respectively.

Large numbers of working donkeys in the study area (28.26%) were seen with different type of wounds, which are associated with improper harnessing, traumatic and infectious origin which was lower than the 45.3% reported in in and around Rama town, Tigray region Fsaye et al. [8]; (57.3%) reported in Mirab Abaya District, Southern Ethiopia Hailu et al. [6] and 48.7%, Dale Sadi District, Oromia, Ethiopia Bekele et al. [22]. The difference in management and husbandry practices including environmental factors, the type of harness material used (natural or synthetic), the fit of the harness, the behavior of the owner, the frequency of work and the load were among risk factors that contribute to the onset of different type of wounds in working donkeys [2, 23].

The present overall finding of skin problems in the study area was 22.17% this was higher than 12.6%, which was reported in Wolaita Sodo zuria district Herago et al. [24]; 21.1% in Hosaena district, Hadiya zone Fesseha et al. [2] and 3.13% in and around Axum Districts, Tigray Regional State Medhin [25]; and lower than 52.6% which was observed in Sebeta Town and Suburbs, Central Ethiopia Arega et al. [26], 36.2% in in and around Hawassa Town Ashinde et al. [27] and 34.3 % in and Around Mekelle Tesfaye et al. [28]. This could probably be due to animals receiving less attention by owners and kept under poor management conditions and due to poor health care.

In this study (21.3%) of animals were seen with musculoskeletal problems like deformities in hoof and legs, different degrees of lameness; fracture, shoof overgrowth and abnormal gait; which is nearly similar with report from Wolaita Sodo Zuria District 21.8% Herago et al. [24] and higher than that of which reported 13.5% in Hosaena district, hadiya zone Fesseha et al. [2]; and lower than 40.6% which reported in Benadir Region, Somalia Mohamed et al. [29]. The difference might be due to many reasons such as overloading, lack of hoof care, and continuous movement in various landscapes and on rough roads that were the main reasons for the occurrences of musculoskeletal problems, and poor management practice by the owners in the study area could be responsible for these problems [2].

This study revealed that 8.26% of animals were observed with eye problems such as lacrimation, traumatic injury, laceration, corneal opacity, and unilateral blindness. This finding was lower

than reported lower than (40.7%) in Wolaita Sodo town Fesseha et al. [2]; and (25.9% which reported in Wogera District, Northern Ethiopia [30]. The use of a whip or other tools to correct the donkeys, traumatic injury, poor hygienic practices and dehydration were the common causes of eye problems in the study area.

The present study revealed that sex of working donkeys was significantly related with the prevalence of different health problems with $P < 0.05$ in which male donkeys were observed with high health problems as compared to female donkeys. This might be due to males are most frequently used for work than female and are hence highly exposed to injury in the present study area [24].

In this study body condition score showed statistically significant association with the occurrence of major health problems with $P < 0.05$. Donkeys with poor body condition were found to develop wound than those having good body condition. This might be due to Animals with poor body condition are more prone to dehydration and decrease the elasticity of the skin and educed immunity leading their increased susceptibility to diseases and other health problems. Heavy work burden coupled with nutritional deficiencies and internal parasites might be the reason for high proportion of thin and very thin animals with health problems [31]. Assessment of treatment history with the prevalence of health problems, revealed that among animals showed major health problems, majority of animals that never taken treatment and vaccination history before showed non-significant $P > 0.05$ but high percentage 64.1% health problems. This might be due to the vaccinated animals and those animals taken immediate treatment has low chance of developing diseases.

Age based assessment has revealed that adult donkeys were more likely to be seen with some of major health problems respectively than young's, even though there was no significant association was observed. Generally, adults have more exposure to work and carrying heavy loads over a long distance. Also, prolonged and frequent exposure of working animals in working lifetime, less owners' attention to wound management and the immune defense mechanism of an animal also reduces with age advancement [8].

Among the major causes and factors related to the occurrence of health problems in donkeys in the study area; Disease are the major health problems that hinder the efficient utilization of donkeys, accounts about (35%). This statement agrees with the report of Mohamed et al. [29]. This might be because there are not enough veterinary services and there is lack of vaccine for donkeys unlike other animals in the study site apart from the awareness limitation of donkey's owners about prevention of diseases [25]. Improper use of harnessing materials accounts for (23.3%) in proportion which led animals to work related wound. Lack of adequate feed and water (13.3%) is also taken as one of the predisposing factors for different health problems in equines. Overloading equines (10%) and damage caused by falling and

other animal bite also the factors for health problems of equines in the study area.

In conclusion the underlined point in study area was that working donkey management system in general was backward i.e., donkey owners do not give more attention for donkey, especially in supplementary feeding, health care, housing management, reducing the load, providing adequate rest times, providing daytime shelters and using appropriate harnesses [32-35].

Conclusion and Recommendations

Although donkey contributed vital role in human livelihoods through direct and indirect contributions to financial, human and social capital, emphasis has not been given regarding welfare issue which include health problems and management requirement. During this study the most common health and welfare problems encountered in working donkeys were different types of wounds, skin lesions, musculoskeletal system problems, infectious diseases, eye problems and dental problems. Diseases, Lack of adequate feed and water, related to work overload, improper harnessing and Traumatic damage due to different factors were the encountered factors that compromise the welfare of working donkeys in study area.

Therefore, based on the above conclusions, the following recommendations are forwarded:

- Since donkeys are overworked, proper feeding and supplementary feed would be necessary.
- Proper veterinary health care and disease prevention strategies should be designed.
- Awareness creation and training of both professionals and donkey owners as to donkey related technologies, basic management, health care and welfare problems of donkeys should be made.
- Improvement of the management practice like housing, health care and use of proper harnessing materials need to be implemented.
- Donkey owners should be encouraged to use different feed resources that can supplement the available donkey feeds

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