



Prevalence of work related wound and associated risk factors in donkeys in Shashogo Woreda, Hadiya zone. Southern Ethiopia.

Dechu Jobir¹ Belayneh Menchamoid² Shewangizaw Debrework³

¹College of Agriculture and Natural Resources Department of Animal and Range Science, Dilla University, Dilla, Ethiopia. *E-mail-dechujobir@gmail.com.*

²College of Agriculture and Natural Resources Department of Animal and Range Science, Dilla University, Dilla, Ethiopia

³Eastern Hararrghe Zone Livestock and Fisher Resource, Harar, Ethiopia
Email- *shewangizaw100@gmail.com*

Corresponding author; Dechu Jobir College of Agriculture and Natural Resources Department of Animal and Range Science, Dilla University, Dilla, Ethiopia.
E-mail-dechujobir@gmail.com.

Abstract

A cross-sectional study was conducted between December 2019 and September 2020 with the objective of determining the prevalence of wounds and associated risk factors in working donkeys in Shashogo woreda, Hadiya Zone, Southern Ethiopia. The study animals were selected randomly. The risk factors were sex, age, body condition scores, condition of saddle, weight load, length of trip and rest within week were assessed through questionnaire survey and physical clinical examination or observation of animals. A total of 384 working donkeys were examined of which 143(37%) were affected by wound. The prevalence of wound vary significantly among sex, age and body condition score of animals. Higher prevalence (96/251:38.2%) of wound was recorded in male than female one (47/133:35.3%). This difference between both sexes was statistically significant (P=0.011). The study also showed that a significantly higher prevalence of wound in adult donkey (82/196:41.8%) followed by old (54/146:37.0%) and young (7/42:16.7%). The highest rate of prevalence was recorded in donkeys with poor body condition (124/307:40.4%) than those with good body condition (19/77:24.7%). The highest distribution of wound was found in back region (6.8%) followed by mixed (5.2%), prescapular (5.2%), forelimb (4.4%), hind limb (3.1%), neck (3.1%), chest (2.6%), abdomen (2.6%) and head (1.8%). Donkey's wounds were commonly distributed on the back and prescapular region. A significant number of abrasion (19.3%), lacerative wounds (8.9%), punctured wound (6.3%) and incised wound (2.9%) in donkeys were reported in this study. The highest prevalence of wound caused by improper harnessing (10.4%) followed by over load (6.5%), injury by sharp object (5.2%), infectious disease (4.2%), biting (3.9%), unknown (3.6%) and falling (3.4%) Generally this study has figured out wound as a major health problem of working donkeys in Shashogo woreda and hence, a comprehensive working donkeys health programs should be implemented in order to alleviate the prevailing problem.

Keywords: Donkeys, Prevalence, Risk factors, Hadiya, Shashogo, Wound.

1. Introduction

Equidae is the mammalian family comprising the single genus *Equus* consisting of domestic and feral horse, donkeys, mule and zebra. More than half of the world's population depends on animal power as its main energy source. Livestock serve many purposes including traction and transport particularly in developing countries. There are an estimated 90 million equine in the developing world, with highest population concentration in central Asia and North and East Africa. (FAO, 2003). Ethiopia holds large potential for equine production. Horses, donkeys and mules belong to the equine group. They are found mainly in temperate, semi-arid or highland areas. Ethiopia has approximately 6.21 million donkeys, which is 32% of Africans and 10% of the world's donkey population. (FAOSTATA, 2014).

The use of equines for transportation would be continue for years to come in Ethiopia. Because of the rugged terrain characteristics in accessible for modern road transportation facilities as well as the absence of well developed modern transport networks and the prevailing low economic status of the community working equines and condition such as tetanus, parasitic infection and colic. In addition these animals worked under difficult terrain and often in appropriate equipment with in adequate food and water resulting in exhaustion, dehydration, malnutrition, lesions and hoof problems. (Brooke, 2007).

Despite the valuable services in livelihood in rural and per-urban Ethiopians, much of health care services are directed towards cattle than equines. This resulted in multiple welfare problems associated with in accessible water, feed and shelter at the working sites and suffering several lesions (Ameni, 2006). Some methods of hobbling to restrain equines cause discomfort and inflict wounds. (Dinka, *et al.*, 2006). Feed shortage and diseases were the major constraints to productivity and work performance of equines in the region. Donkeys involved in pulling carts often work continuously for 6 to 7 hours/day carrying approximately 200kg – 500kg in a single trip. Donkey were often involved in more multipurpose activities than other equines. They transport goods to and from markets farms and shops by travelling long distances. They would also pull carts coming heavy loads 3 to 4 times their body weight. And they work from 4 to 12 hours per day depending on the season and type of work (Biffa and Woldemeskel, 2006).

Management practice to prevent or to reduce health problems associated with work included short initial working periods until the animal develops resistance. Wounds are amongst one of the commonest health concerns to afflict working donkeys in many countries (Behinke and Metaferia, 2011; Getachew *et al.*, 2010). In addition the study on donkeys in Ethiopia has demonstrated that back scores and wounds are the most commonly observed health problem. The potential cause of equine wounds is almost endless punctures from sharp object like metal and glass shear wounds from barbed wire sticks, collision injuries from falling or running into the object and entrapment such as getting a leg hung up in a rope on in cattle are major cause of injury (Getachaw *et al.*, 2010; Asfaw *et al.*, 2012).

Wounds in working donkeys are seen on the leg, girth, tail, saddle and wither regions (Getachaw *et al.*, 2010; Gezachew *et al.*, 2013). These wounds are often caused by combination of poorly fitting and designed tack or harnesses, beating with sticks and improper management practices. One approach to decrease the prevalence of wounds is through education of donkey users (Getachew *et al.*, 2010; Asfaw *et al.*, 2012). Drought animals should be shod, if they are made to work on hard surfaces proper wound management (rest and prevent complication). And avoid use of same harness for different drought animals (Guyo *et al.*, 2015).

Despite their significant contribution to the communities and the national economy little attention is given to study the health aspects of working equids. The available studies are mainly on the prevalence of infectious disease with limited studies on external injuries. To date there is no work done on the prevalence of wound, the types of wound, the causes of wound and its associated risk factors in working donkeys in Shashogo woreda, in Hadiya zone. Such information would be useful for designing strategies that would help to improve donkeys health and welfare.

Objectives

Thus, the objective of the study would be :

- To identify the prevalence of wounds
- To study the causes of wounds and assess the types of wounds
- To identify the influencing factors associated with the occurrence of wounds in working donkeys in the study area.

Limitations

In this some challenges would be faced in the study area

-) Lack of adequate and accurate or reliable data.
-) Lack reference materials and previous research data.
-) Lack of information technology.
-) Shortage of time to collect data.
-) Lack of infrastructures like road and vehicle.
-) Lack of laboratory access to be accurate.
-) Shortage of budget.
-) Lack of positive man power.

2. Literature Review

2.1 Donkeys, the backbone of rural transport

The donkey population has declined in most industrialized countries in America and Europe resulting in the assumption that the donkey population will decrease also in the emerging industrialized countries. But in Africa, the donkey is still very important in the rural areas and for transport in the urban areas (Starkey, 1998). Donkeys are mainly owned by small-scale farmers and are used to carry goods on their backs or pull carts loaded with goods as firewood, animal feed, grains, water and building material. Each day thousands of donkeys enter Addis Ababa and other urban cities in Ethiopia, carrying different products (Starkey, 1998).

Farmers that can afford cart or pack animals get higher prices for their crops when transporting it by themselves to markets, because they avoid paying margins to traders (Anderson & Dennis, 1994). Compared to motor vehicles, animals are slower and do not have the same carrying capacity, but the animals have other advantages (Anderson & Dennis, 1994).

Donkeys are very appreciated for their characteristics; they are cheap, hardy, suitable for different terrain like dry areas and hills, resistant to diseases and easy to handle and train. In some parts of Ethiopia, the infrastructure is still not fully developed with low quality roads and in these areas people depend on their donkeys (Pearson et al., 1999).

The donkey is perceived as an unclean animal and due to this the meat is not eaten (personal communication, Duguma, 2016), consequently the risk of theft is reduced and the farmer can allow donkeys to wander unsupervised which is another advantage with owning donkeys (Starkey, 1998). If the donkeys get too sick or injured so they no longer can be used for work, the owners lose their livelihoods, either temporarily or permanently. To keep donkeys in good condition is not only important for the welfare of the animals but also for the livelihood for the people who own them (Kumar et al., 2014).

2.2. Management of working donkeys

2.2.1 Housing

In rural areas in Ethiopia, it is common to keep the donkeys together with other livestock, mostly cattle. At night, donkeys are confined either in stables, in a *kraal* (enclosure) or at the owner's home. If the donkeys are not used for work during the day, they are grazing loose or tethered. Donkeys can also be tethered without access to pasture; under trees, in houses or kraals during the day (Pearson et al., 2000).

2.3 The hard life of a working donkey

2.3.1 Life expectancy

Donkeys can reach an age of 35 years if they are well managed, but the life expectancy of a working donkey in Ethiopia is merely 9-13 years (Starkey, 1998). In a study by Kumar et al. (2014), the average age was 7 years and only 4.4% were older than 15 years. The same study also showed that young donkeys worked with the same activities as older donkeys which can lead to poor health for the young donkeys. This result led to the researcher assuming that people who use donkeys may only be interested in short term immediate gain, rather than a long term working life of their donkey (Kumar et al., 2014).

2.3.2 Health problems

Working donkeys suffers from animal welfare problems such as gait abnormalities, tendon and joint swellings, skin lesions, ectoparasit (Burn *et al.*, 2010; Amante *et al.*, 2014), lip lesions, tether and hobbling lesion (Mekuria & Abebe, 2010) and dental problems (Kumar *et al.*, 2014). Firing lesions is caused either by the owner burn-marking the animal or by traditional medical treatments (Burn et al., 2010a). The majority

of working donkeys also suffers from low BCS (Burn *et al.*, 2010a; Amante *et al.*, 2014; Kumar *et al.*, 2014).

The cause of lameness differed; in rural areas, wounds (mainly hyena or donkey bites) were the most common reason, whereas in urban areas it was road traffic accidents. Burn *et al.* (2010a) also studied the difference in equine welfare problems in urban and rural areas and found that skin lesions and displayed aggression was more common in urban areas. On the other hand, rural equines were thinner, mostly scored as three or less in BCS and had higher prevalence of ectoparasite, gait and sole abnormalities, fecal soiling and tendon and joint swelling.

2.3.3 Improper work equipment and overloading

Other common animal welfare problems are improper harnessing, overloading and overworking the donkeys (Kumar *et al.*, 2014).

A properly designed harness allows the working donkey to pull the load to the best of its ability without risk of injuries. On the other hand, a poorly designed or ill-fitted harness will result in fatigue, discomfort or lesions on the donkey (Pearson *et al.*, 2003).

Ill fitted harnessing can lead to skin lesions at the withers, back region and underneath the base of the tail (Kumar *et al.*, 2014). Harness lesions will not only be painful for the animal, it will also increase the risk of secondary infections which will reduce the work capacity and longevity of the donkey (Smith *et al.*, 2014). Thin donkeys have less natural padding that protects them from friction, pressure and lesion caused by harnessing, and below score 3 in BCS is correlated with lesions of skin and deeper tissues (Pritchard *et al.*, 2005).

Donkeys are often controlled by halters that can be made from rope, webbing, cotton or leather. Materials such as wire, chain or other materials that may chafe or cause skin lesions are unsuitable to use. A saddle can be used when loading products on the donkeys back and are usually made of wood consisting of two X-shaped pieces attached to two oval support pads. When using this form of saddle, it is important to use padding between the saddle and the animals' back, to protect the backbone. Materials that are recommended as padding are cotton, wool blankets and sheepskin. Plastic and synthetic material should be avoided because it will give the donkey lesions. It is also important that the load should be well balanced on both side of the back, otherwise the donkey will use

more energy in carrying it and will get exhausted (Pearson *et al.*, 2003).

To hobble donkeys i.e. tie two legs together with a short rope, is commonly performed to prevent the donkey from wandering off (Pearson *et al.*, 2003). Hobbling the donkey in an unsuitable way can cause discomfort and wounds (Amante *et al.*, 2014) and it is recommended that the hobbles should be made of soft materials to prevent chafing and wounds. Only the front legs should be hobbled, never the back legs together or one back leg to a front leg, and two animals should never be hobbled together (Pearson *et al.*, 2003).

2.3.4 Treatment of sick donkeys

When a donkey's health deteriorates, the owners use different treatment strategies. Studies in Tulla show similar results; most unhealthy donkeys do not receive any treatment but are instead forced to keep on working. Some owners take their donkeys to a nearby veterinary clinic or treat them traditionally (Biffa & Woldemeskel, 2006; Kumar *et al.*, 2014).

An example of traditional remedies that are used, by the owner or a local healer, is pouring plant juice or oil on the donkey. According to donkey owners, one constraint of donkeys is the absence of veterinary clinics. If the donkey is finally taken to a veterinarian it is usually in a progressed stage of illness and has usually been subjected to numerous traditional remedies (Kumar *et al.*, 2014).

2.3.5 The physiological state of working donkeys

Many studies have reported behavior problems such as unresponsiveness and apathy in working donkeys over different parts of the world (Burn *et al.*, 2010; Amante *et al.*, 2014; Kumar *et al.*, 2014).

Apathy was most prevalent in older and thinner donkeys and is associated with others indicators of poor health like abnormal mucous membrane color and fecal soiling (Burn *et al.*, 2010a; Burn *et al.*, 2010b).

2.4 Animal welfare assessment protocol

Animal welfare is a multidimensional concept comprising good health, comfort, expression of behavior etc. (Botreau *et al.*, 2007), therefore it is essential to include both health and behavior when

assessing animal welfare. Farm animal welfare has become a great concern of the European public, and for this reason the European Union initiated the Welfare Quality® (WQ®) project. The projects aim was to develop a system for on-farm monitoring of animal welfare and to provide advice on improvements of welfare (Miele *et al.*, 2011). To improve welfare of the working donkeys, essential feedback to the owner is necessary, as stated in the WQ® project. Feedback along with practical advice and alternative strategies can help the farmer to improve the animal welfare through informed decisions (Blokhuis *et al.*, 2010).

3. Materials and Methods

3.1 Study area

Hadiya administrative zone has a total area of 3850.2 km² and for administrative purposes it is structured in to 13 district such as lemo, analemo, misha, soro jacho, shashogo, duna, gibe, amaka, gombora, hanicha, east badawacho and west badawacho and also has two administrative cities hossanna and shone. Among them Shashogo district is one. The zone has three agro ecologies such as “Highland (Dega)”, “Mid land (Woynadega)” and Low land (“Kola”). The topographically the zone lies within an elevation range of 1500 to 3000 meters above sea level. The total population of the zone is estimated about 1,412,347 and it has population density 366 in habitants per km. The annual rain fall in the zone is 1260mm. Shashogoworeda is located in Hadiya zone SNNP Regional government of Ethiopia. It is 54 km from east of Hosanna and 224 kms south of Addis Ababa. Topographically, it is located at an altitude range of 1900-2100 meter above sea level. The average temperature is 21.6°C with lower temperature fluctuation climatically. According to Shashogo district agricultural statistics information, the animal population has about 103,020 cattle’s, 18,927 sheep, 29,123 goats, 1834 donkeys, 928 horses, 252 mule and 102,747 chickens (HADB, 2009).

3.2. Study animals

The study animals were randomly selected donkeys in Shashogoworeda, Hadiya zone, in southern Ethiopia. A total at 384 donkeys with different sex, age and body condition score were included in the study. The work related wounds in donkeys were kept under different management system was the study animals.

3.3. Study design and sampling

A cross sectional study was conducted from December 2019 and September 2020 in Shashogo woreda, Hadiya zone, southern Ethiopia. A total of 384 donkey were selected randomly. Each randomly selected donkey had been examined physically for any external body injury and findings including site severity and type of wound had been recorded on physical examination sheet.

Moderate injuries were involving coalition of small wound with tissue sloughing involving no complication and hypertrophy and some with chronic causes. Wounds were categorized as mild when they involve only loss of epidermis and superficial layers with no further trauma. Wounds were also classified as abrasion, laceration, incision and puncture (Feseha, 1997)

Age and body condition score (BCS) estimations have been made according to the method described by Sevensen (2008). Wound severity and classification estimation were made as indicated by Biffa and Woldemeskel (2006) and Knottenbelt (2003) respectively.

3.4. Sample size determination

To determine the sample size the expected prevalence in the study area was assumed to be 5%, at 95% confidence interval because of absence of previous study at the prevalence of wound in the study area. Therefore ,the sample size was calculated based on the formula given by Thrusfield (2005), the minimum of 384 donkeys were sampled.

$$N = \frac{1.96^2 [p_{expe}(1 - P_{expe})]}{d^2}$$

$$N = \frac{1.96^2 p_{exp} (1 - p_{expe})}{d^2}$$

Where N= sample size
p= expected prevalence
d= desired absolute precision

3.5. Data Management and Analysis

Data were entered and managed in Microsoft excel SPSS version 20 soft ware was used for the data analysis. The differences in parameters like age, sex ,body condition and other factors on wounds in working donkeys were analyzed by using x²(chi-square) technique and the level of significance was set at p<0.05.

4. Results and Discussion

This study revealed an overall prevalence of wounds in working donkey were 143 (37.0%) higher prevalence of wound was recorded in male donkey 96 (38.2%) than female ones 47 (35.3%).

The difference between both sexes was statistically significant (p=0.011). The study has showed signification higher prevalence of wounds in adult donkey 82(41.8%) which followed by olds 54(37.0%)

and young's 7(16.7%). There was statistically difference (p=0.001) among age groups. Similarly the distribution rate of wound on working donkeys which have different body condition where studied and the highest rate was recorded in donkeys with poor body condition 124(40.4%) than those with good body condition 19(24.7%) Statistically significant variation (p=0.000) in the prevalence of wound was recorded among sex, age and bcs were summarized in table `1.

Table 1: prevalence of wound in relation to sex, age and body condition of donkeys

Variables	No of examined	No of affected	Prevalence (%)	x ²	P-value
Sex					
Male	251	96	38.2	14.23	0.011
Female	133	47	35.3		
Age					
Young	42	7	16.7	33.49	0.001
Adult	196	82	41.8		
Old	146	54	37.0		
BCS					
Poor	307	124	40.4	6.69	0.000
Good	77	19	24.7		

Significant difference (p=0.004) was also observed in the distribution of wounds among different parts of the body in donkeys where the highest numbers of

wounds were recorded in back 26(6.8%) while, the lower number of wound recorded in head region 7(1.8%).(table 2)

Table 2: distribution of wound on various body parts of donkeys.

Sites of wound	No of affected	Prevalence (%)	x ²	P-value
Head	7	1.8	50.53	0.004
Neck	12	3.1		
Shoulder	9	2.3		
Chest	10	2.6		
Fore limb	17	4.4		
Prescapular	20	5.2		
Back	26	6.8		
Abdomen	10	2.6		
Hind limb	12	3.1		
Mixed	20	5.2		
Total	143	37.0		

The majority of wounds in donkeys were caused by improper harness and over loading. The lower prevalence of wounds was caused by falling. There

was significant variation ($p=0.000$) among various causes of wounds in donkeys (table 3)

Table 3: causes of wounds in donkeys.

Causes of wound	No of affected	Prevalence (%)	χ^2	P-value
Improper harness	40	10.4		
Infection diseases	16	4.2		
Injury by sharp objects	20	5.23	8.54	0.000
Over loading	25	6.5		
Falling	13	3.4		
Biting	15	3.9		
Unknown	14	3.6		
Total	143	37.0		

There was statistically significant ($p=0.019$) among type of wound in donkey. Abrasion was the highest wound types 74(19.3%) which was followed by

lacerative 34 (8.9%), puncture 24(6.3%) and incise 11(2.9%) types of wound in donkeys (table 4)

Table 4: Prevalence of types of wounds in donkeys

Types of wound	No of affected	prevalence (%)	χ^2	p-value
Abrasion	74	19.3		
Laceration	34	8.9	69.21	0.019
Puncture	24	6.3		
Incise	11	2.9		
Total	143	37.0		

4. Discussion

In the present study the overall prevalence of wound in working donkeys was 37%. This finding was markedly lower than the reported 79.4% in Hawassa (Biffa and WoldeMeskel, 2006) 59% in Jordan (Burn *et al.*, 2007) and 43% in Wolaitasodo (wale Tesfaye and KeroMekuria ,2009) but closer to the report by Pearsons *et al.*, (2002) that reported 40% in central Ethiopia. This might be due to variation in management and husbandry to the donkeys in the region. This study also revealed that sex did have significant effect on the occurrence of wound in the study area with higher proportion of wound in males (38.2%) than females (35.3%). This might be due to males are most frequently used for work than female and are hence highly exposed to wound injury in the present study area.

From the age categories the present finding has showed that (16.7%) of wounds in young (41.8%) of wounds in adults and (37.0%) of wound were in old donkeys. This showed that a significantly higher prevalence of wound was recorded in adult and old donkey. This might be due to the fact that adult and old donkey was involved in a wide array activities yet very little management was accorded to them. They were made to carry heavy leads over long distances and long hours and it could also be attributed by lack of regular feeding and health care provision were not practiced regularly. So the prevalence rate of wound in adult and old donkeys was higher than in young animals which is in contrary with finding of Biffa and Wolde Meskel. (Biffa and Wolde Meskel, 2006).

In this study the distribution of wound in donkey of different body condition was studied and the highest rate was recorded in donkeys with poor body condition (40.4%) followed by those with good body condition (24.7%). This is in line with the reports by Makuria *et al.*, (2013) and Pearson *et al.* (2002), those indicated that poor physical condition mainly due to malnutrition is the leading causes of sores in donkeys. The probable reason for such association is due to donkeys with a poor body condition score may have less natural padding protecting them from pressure, friction and shear lesions caused by saddle. In contrast no significance difference between wound prevalence and body condition score was reported in a research done in morocco by Sells *et al.*, (2010). In the current study, the highest distributions of wound was found in back (6.8%), mixed (5.2%), prescapular (5.2%), forelimb (4.4%), hind limb (3.1%), neck (3.1%), chest (2.6%), abdomen (2.6%), shoulder (2.3%) and head (1.8%). Donkey wounds were found commonly distributed on the back and prescapular region. Similarly, Biffa and Woldemeskel (2006) and Tesfaye and Curran, (2005) reported the same scenario in south and central Ethiopia respectively. This might be due to poorly designed and ill fitted saddles and straps manufactured by unskilled artisans or donkey owners.

Where as in the report done by Sells *et al.*, (2010) in morocco the most common site of wound was the withers, this difference might be attributed to the different design in saddle and strap.

In the current study, significant different was recorded in the number of abrasion wounds (19.3%), lacerative wounds (8.9%), punctured wounds (6.3%) and incised wounds (2.9%). The highest prevalence of wound was caused by improper harnessing (10.4%) followed by over loading (6.5%), injury by sharp object (5.2%), infections disease (4.2%), biting (3.9%), unknown (3.6%) and falling (3.4%). This means that improper harnessing was the main cause of injuries in the study area as the harnessing materials were made from wood and metal materials by local harnessing material makers who didn't consider the prepared materials with the body condition of the donkeys, movement and balance of the weight. As the result the materials are unable to distribute the weight equally in either side of the animals leading to injury. This finding is consistent with results reported by Pearson *et al.*, (2002) in central Ethiopia and Helen (2001) in northern Ethiopia that improper harnessing and saddle were major causes of injuries.

In the present study infection related injuries were also shown as causes of wound indicating involvement of bacterial and mycotic pathogens in the injury. Such type of infections were characterized by abscess, ulceration and their typical clinical signs observed in the donkey. Similar to this observation Bojia (1996) and Gobena, (2001) reported that mycotic dermatitis, ulcerative and epizootic lymphangitis were the major infectious skin diseases of equines in Ethiopia. Damage caused by over loading and biting was the causes of wounds in donkeys which were also reported in Hawass, Ethiopia (Biffa and Woldemeskel, 2006).

5. Conclusion and Recommendation

The present study has revealed high prevalence of wounds in working donkey in Shashogo woreda, Hadiya zone southern Ethiopia. Improper harnessing and saddle, over loading, injury by sharp objects, infectious diseases and biting was the major contributor to the higher prevalence of the wound in donkeys. The possible risk factors responsible for the occurrence of wounds in working donkey were sex, age, and body condition. In donkeys the abrasion wounds were more prevalent that followed by lacerative wounds, punctured wound and incised wound. Conclusively wound problems were prevalent in working donkeys in the study area calling for formulation of strategic control measures like health education about the disease transmission, risk factors reduction, use of proper harnessing and saddles, and care and proper handling of their animals.

Based on above conclusion the following recommendations were forwarded.

- Awareness to people about the welfare of donkeys and education about the transmission.
- There should be care for donkeys during cart pulling.
- Proper using harness materials and saddles and health care management.

6. References

- Ameni, G, (2006): Preliminary trial on the reproducibility of epizootic lymphangitis through experimental infection of two horse. Short communication. Journal of veterinary, 172:553-555
- Anon, B. (2007) : FAO Statistical Database Website. Food and Agricultural Organization of the United Nations. Accessed on 22 October 2009 ([Http://faostat.fao.org/](http://faostat.fao.org/)).

- Behinke, R. and Metaferia, F (2011).The contribution of Livestock to the Ethiopian Economy-Part II. IGAD LPI Working Paper No. 02-11,43.
- Biffa D. and woldemeskel M.(2006) causes and factors associated with Occurrence of external injuries in working equines in Ethiopia *Int'l J Applied Res .Vet.Med*, 4,1-7
- Bojia, E.D. (1996): Epidemiology of epizootic lymphangitis in Ethiopia: Retrospective analysis, Cross-sectional study and treatment trial at Deber-zeit and Akaki Towns.DVM thesis. Facul. Vet. Med, Addis Ababa University, Ethiopia.
- Brooke (2007) Bearing heavy burden Available online at <http://www.fao.org/> file admin / user – upload/ animal welfare /Brooke report.pdf [Accessed g April 2014].
- Crane, M(1997) Medical in the professional hand book of the donkey (3rd end) whitted books limited 18 Anleyroad London Pp : 19-36
- CSA(2008): Report on, Size, characteristics and purpose of livestock and use of livestock products, (SNNPR, central statistical Agency of Ethiopia, Pp.279.
- Curran, M.; G. Fescha and D. smith, 2005. The impact of access to animal health services on donkey health and livelihoods Ethiopia, tropical animal health and production, 37(1): 47-65.
- FAO (2003) FAO statistical data base website food and agriculture organization, Rome, Italy (FAO STATS:<http://apps.foa.org>).
- FAO state (2014) Ethiopia faculty of veterinary medicine Addis Ababa University , PO Box 34, Debre-Zeit Ethiopia.
- Feseha G.A, 1997. In Elisabeth DS (ed) diseases and health problems of donkeys abroad. Professional hand book of the donkeys (3rdedn) white limited, London.
- Getachew M., Trawford A., Feseha G. and Reid, S.W.J (2010); Gastrointestinal parasites of working donkeys of Ethiopia. Tropical Animal Health and Production 42:27-33.
- Guyo,s, Legesse,s and Tonamo,A (2015)Areview on welfare and management practices of working equines. *Glob,tAnim, SciLinest. Prod. Anim Breed*. 3(6)*Pp* .203-209.
- Helen, B, (2001). The gharry horses of Gonder. Draught animal news. Centre Tropical veterinary Medicine University. Edinburg. Scotland, 35: 23-24.
- Knottenbelt, D. (2003): Handbook of equine wound management. London:Saunders.
- Mekuria, S. Matusala, M. and Rahameto, R. (2013): Management practices and welfare problems encountered on working equids in Hawassa town. Southern Ethiopia. *Journal of Veterinary Medicine and Animal Health* 5(9):243-250.
- Pearson RA. Mengistu A, Agajie T, Eleanor FA, David GS, MesfinA(2000). Use and management of donkeys in peri-urban areas of Ethiopia. Centre for Tropical Veterinary Medicine: University of Edinburgh, Scotland;Draught Anim. Power Tech. Rep.5.
- Rama's Wamy, N.S, 1994. Drought animals and welfare *Rev,sci.Tech*. 13; 195-216
- Sevendsen, E. (2008):The professional handbook of the donkey. 4th ed. London: Whittet Books Limited.
- Svendsen E.(1997)Parasites Abroad the professional hand book of the donkey (3rdedn) white books limited 18 Anley Road,London,Pp:166-182.
- Tesfaye, A and Curran, M(2005): A longitudinal survey of market donkeys in Ethiopia. *Tropical Animal health and Production*. 37:87-100.
- Thrust field,M(2005) veterinary Epidemiology (2ndedn) UK, Black well science Ltd.Pp182-189.
- Wilson, R, 2003. The environmental ecology of oxen used for drought power. *Agr.Ecosysts, environment*, 97: 21-32

Access this Article in Online



Website:
www.ijarbs.com

Subject:
**Veterinary
Sciences**

Quick Response Code

DOI:[10.22192/ijarbs.2021.08.07.025](https://doi.org/10.22192/ijarbs.2021.08.07.025)

How to cite this article:

Dechu Jobir, Belayneh Menchamoid Shewangizaw Debrework. (2021). Prevalence of work related wound and associated risk factors in donkeys in Shashogo Woreda, Hadiya zone. Southern Ethiopia. *Int. J. Adv. Res. Biol. Sci.* 8(7): 218-226.
DOI: <http://dx.doi.org/10.22192/ijarbs.2021.08.07.025>