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Animal Husbandry, Health Constraints and Welfare of Cart-Equines: The Case of Bako, Sire and Nekemte Towns of Western Oromia, Ethiopia

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Abstract: A preliminary study was conducted at Bako, Sire and Nekemte towns of Western Oromia in the year 2014 with the aim to assess the husbandry and handling practices of cart and working equines and to identify health and welfare of constraints working equines. The mean cart-equines' working time per day identified during the current study at Bako, Sire and Nekemte towns was 7.2±1.45, 6.15± 0.95 and 6.15± 1.03 hours, respectively. The family members living on the income obtained from cart-equine work was 4.15± 1.76, 4.19± 1.79 and 4.08± 1.73 for Bako, Sire and Nekemte towns, respectively. Cart-equine management and welfare in the study area was poor that the handling, housing, feeding and health care were not efficient. About 47.14% of cart horses and 61.41% of mules studied were under fair body condition score which might had increased animal vulnerability to disease and mechanical injuries. Lymphangitis was reported (50.8%) the first killer disease followed by equine colic where 15.8% carte-quine owners reported it the second killer disease. To make lasting improvements to the welfare of working equines, it needs to persuade key local, national and international institutions and the government to include the welfare of working equine animals in their livestock development policy and program.

Key words: Animal-Welfare · Cart-Equines · Western Ethiopia · Animal-Health

INTRODUCTION

Equines are important animals to the resource-poor communities in rural and urban areas of Ethiopia, providing traction power and transport services at low cost. The use of equines in door-to-door transport service also provides urban dwellers with the opportunity of income generation [1]. In Ethiopia, the use of equines for transportation will continue for years to come because of the rugged and terrain characteristics that are inaccessible 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 [2]. Therefore, the health and welfare of equines should be of crucial importance to Ethiopia. Despite their invaluable contributions, equines in Ethiopia are the most neglected animals, accorded low social status.

In contrast to cattle, buffalo and camels, which are usually kept for their milk, meat and work and whose hides are also cured for leather and even their dung has a number of uses [3], equine by-products are not generally used except as source of energy, therefore they are the cheaper to replace in comparison to other large animals. Poor infrastructure and very rugged topography in many parts of rural Ethiopia and lack of capacity to pay for vehicles in the suburbs have made transportation by vehicles inaccessible. Hence, farmers and urban people use alternative means like equines to combat transportation problems.

Working equines are prone to painful, debilitating and often fatal tropical illnesses and conditions such as tetanus, parasitic infection and colic. In addition, these animals work under difficult environmental conditions including intense heat, difficult terrain and often inappropriate equipment, with inadequate food and water, resulting in exhaustion, dehydration, malnutrition, lesions and hoof problems [4]. Research conducted in Ethiopia demonstrated the importance of improved work output of equines achieved through improvements in the animals' welfare and as a pathway out of poverty for some of the

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poorest communities in peri-urban areas [5]. Even though few works have been conducted in the central, eastern and southeastern parts of Ethiopia, scientific information was not yet available on the handling management and welfare and health constraints of working equines in general and cart-equines in particular in the western Ethiopia. Therefore, this study was conducted with the objectives of assessing the husbandry and handling practices of cart and working equines in the area and to identify challenges, production opportunities and the welfare of working equines to the owners' livelihood.

MATERIALS AND METHODS

Description of the Study Area: The study was conducted at Bako (a town of west Shoa zone) and at Sire and Nekemte towns of East Wollega zone and their suburb vicinities. Bako, Sire and Nekemte, towns are found on the main road from Addis Ababa (the Capital city of Ethiopia) to Nekemte, at 250 km, 280 km and 330 km distances respectively, to the west. Bako and its surroundings (found at 9.12° latitude and 37.05° longitudes), represent hot-humid environment while Sire and Nekemte represents cooler environment found within the altitudinal range of 1, 200 to 2, 342 meters above sea level. Sire and Bako have relatively plane topography while Nekemte has mainly terrain topography.

Study Design and Sample Collection

Examination: Physical examination was conducted to identify if mechanical and infectious disease injuries had happened on the body of cart-equines. The examination was carried out at the working site while animals were on-duty during daytime, where animals were made stop working for 5 to 10 min whilst being held by a lead rope attached to the head collar [6]. General information was recorded for each animal including work type, sex of animal, species, age, health status, workload, feeding, housing and health management of animal. Subsequently, the parameters body condition score and lesions and healed scars were recorded with regard to severity and anatomical location. Body condition assessment was employed by examining the animal from all sides without touching it. The body condition of selected animals was scored based on the criteria's described by Carroll and Huntington [7] as cited by Pritchard *et al*. [8]. The equids' body condition was scored as 0 to 5 (0 = very thin; 1 = thin, 2 = fair, 3 = good, 4 = fat and 5 = very fat).

Animal Welfare and Management: Lesions of any size and severity at the external corners (commissures) of the lips, where the bit wound lie were considered as lesions of the lips. Scars, hairless skin and broken skin were also regarded as labial lesion. Lesions on the limbs were considered as being caused by tethering/hobbling, if any kind of hair loss, scars, healed or fresh lesions were present along the limb (6 and 8). Wounds of the skin and deeper tissues were assessed according to the area, depth and location [6]. The animals under the study were deemed positive for external parasites when they were found to harbuor at least; one external ecto-parasite (mainly ticks).

Statistical Analysis: The raw data collected was managed into Microsoft excel and then descriptive statistics was used to analyze qualitative data. Quantitative data on cart equine diseases, animal feeding frequency and daily feed cost and veterinary health cost were analyzed with descriptive statistics in SPSS ver. 20.

RESULTS AND DISCUSSION

Animal Burden and Work Types: The increasing human population and high cost paid for motorized vehicles have resulted in an increase in demands for cart equines to transport goods, water, fruits and construction materials to and from shop, market, remote and inaccessible areas. These animals have also been playing significant roles in the diversification of sources of incomes for cart equine owners and farriers in the study area. Figure (1) below shows the burdens that cart equines are sharing from the poor in both accessible and remote and inaccessible places. Poor road infrastructure and highly rugged topography in Nekemte area have made transportation by vehicles difficult and less accessible. Hence, peoples use alternative means mainly cart-equines; especially mules and horses to combat transportation problems. The result agrees with the report of Mohammed [9] who stated that poor infrastructure and very rugged topography in many parts of rural Ethiopia have made transportation by vehicle inaccessible.

Cart-equines can walk through narrow ways and on muddy roads being supported by farriers where they could share burden of women and children in addition to which different kinds of goods are transported to every home of rural and urban society. However, harnessing materials and the saddles used were uncomfortable (Fig. 1) to animals and the wheels and tires were mostly worn-out ones that expose animals to back and chest injury. The mechanical makeup of saddles used were uncomfortable that adds other load to cart-equines that also reduces animal's efficiency of pulling.

Table 1: Workload and burdens that cart equines may share from people

Type of Cart equine	N	Average Load in Quintal		Study Towns	Average working time of Cart-equines		N of family dependent on Income		Daily income and Expenditure			
									Income		Expenditure	
		Mean	Std	Bako	7.20	1.45	4.15	1.76	76.25	24.41	12.35	7.38
Horse	69	3.74	0.87	Sire	6.15	0.95	4.19	1.79	92.43	31.04	25.89	8.92
Mule	58	4.14	0.74	Nekemte	6.15	1.03	4.08	1.73	90.25	31.25	26.57	10.31
Donkey	3	3.0	-	Grand mean	6.50	1.26	4.14	1.75	86.15	29.66	21.49	11.07

* N= Number of respondents, Std= standard deviation

Table 2: Animal body condition score and losses of cart-equines due to deaths

Estimated body condition score of working equines	Species of Animal			
	Horses		Mules	
	Frequency	%	Frequency	%
1= thin	16	22.86	1	1.75
2= fair	33	47.14	35	61.41
3= good	21	30.0	21	36.84
Total	70	100.0	57	100.0

The current study revealed that cart-equines in this study area were used mainly to pull goods in contrast to those, which mainly are used for the transportation of people and goods in the central Ethiopia. Cart-equine works assessed under this study also revealed that animals were staying for an extended working time per day carrying more than 300 kg per trip (Table 1). The mean and standard deviation load per trip identified for horses, mules and donkey was 3.74 (0.87), 4.14 (0.74) and 3.0 quintals, respectively. The mean and standard deviation daily working time in hours at Bako, Sire and Nekemte towns was 7.2 (1.45), 6.15 (0.95) and 6.15 (1.03) hours, respectively. The assessment result concerning working time that animals stay at work according to the current study is in agreement with the report by Solomon *et al*. [10] who stated that the average labor time per equid per day amounted to 7.9 ± 0.2 h. However, the load that cart-equines carry per trip was much higher than the report of the same authors, which were 70 kg and three travelers being transported over an average distance of 25 ± 2 km. The load per animal per trip studied under this research was also much higher than the report by Sisay [11] while the daily time spent on work is in agreement with that Horses involved in pulling carts often work continuously for 6 to 7 hours/day, carrying 3 to 4 persons (195–260 kg) in a single trip. Cart equines and cart pulling at this study area were prepared and used only for transportation of goods and did not used for transportation of people in contrast to equine carts which are used for transportation of people and goods in other parts of Ethiopia.

According to the current study, 47.14 and 61.41% of horses and mules engaged in cart pulling, respectively had fair body condition (Table 2) where 30.0 and 36.84% of horses and mules, respectively had good body condition scores estimated. Animals with body condition score of thin to fair have less muscular accumulation that might contribute to low working efficiency and short life-span of cart-equines in the study area. Poor animal management and husbandry also had resulted in shortening the service period of working animals where cart-equines, especially horses were used for a maximum of three years that porn cart-equine owners to economic losses (personal observation and key informant interview). According to the current study; 19, 22 and 4 farriers at Nekemte, Sire and Bako towns respectively, loss 1-3 of their cart-equine within the 12 months of the study period. The mean and standard deviation loss of money was therefore, 4521.05 (2912.15), 4778.26 (3664.69) and 5725.00 (1330.10) Ethiopian Birr for Nekemte, Sire and Bako towns, respectively. Losses of animal by death might have resulted in total loss of their job for some of farriers because of lack of money to replace their lost cart-equines. The current study also revealed that average losses of money by cart-equine owners exceed the average purchasing price of one animal (horse or mule).

Animal Welfare and Health Status: The efficient use of working animals depends on how they are connected to the implement they are pulling or the materials they are

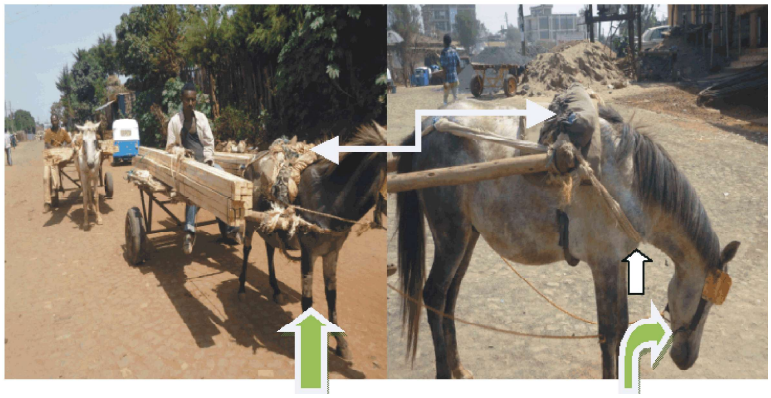

Fig. 1: Type of harnesses and hobbling methods affecting health of animals: Left - Legs of mule damaged by hobble and Right- wire attached to harness on mouth and breast band rubbing chest and for both animals uncomfortable saddle

Fig. 2: Animals suffering from disease and lack of feed: *Left bloody wounded leg of cart Horse and right animal working with wounded legs*

carrying and how well they have been trained and are managed [12]. The terrain topography of the study area, the method and type of harnessing used and the manner how the harnesses were attached and the skill inefficiency of farriers poses serious welfare problems and the majority of injuries observed with equids were harness related (Fig. 1). The method used for hobbling [Hobbling means to tie the legs of (a horse) together in order to restrict its movement (Collins Essential English Dictionary, second edition 2006)] also had contributed for the wounds of fore and hind legs. Starkey *et al.* [13], found that existing harnesses for donkeys and horses are often poorly designed and are crudely repaired with wire, causing problems to the animals. The current study also confirmed the report by Starkey *et al*. [13] that, collars and harnessing materials prepared and maintained locally injured the comminsures, chest, shoulder and hips of cart-equines.

The conformation of equids is not suited to neck yokes but to collars and breast bands, therefore, all farriers in this study area uses two-wheel cart and breast band for cart pulling. The current study therefore, agrees with the report of Starkey [14] who stated that it is generally agreed that the yoking of horses, mules or donkeys is not an efficient harnessing strategy and breast bands or collars are the harnessing systems of choice. Aganga and Maphorisa [15]. Also further suggested that the use of neck yokes in donkeys be discouraged, to not only improve their welfare, but also their effectiveness. However, the breast band used to pull cart and collars used were not properly prepared and porn the animal to back, chest and shoulder wounds (Fig. 2).

Among the major animal health problems in the study area were Lymphangitis, cough, Trypanosomosis, colic, rotten foot, mechanical injuries and lameness were the major cart-equines diseases assessed and listed in order

Table 3: Major animal diseases and animal vulnerability

	Health problems						
	Disease occurrence		Death rate			Animal & vulnerability to	
Major diseases	N	%age	N	%age	Species of death	N	%
Trypanosomosis	5	4.2	5	4.2	Horse	37	30.8
Lymphangitis	61	50.8	61	50.8	Mule	7	5.8
Colic	19	15.8	19	15.8	Both	2	1.7
Mechanical damage	2	1.7	2	1.7	Loss of cart equines by death		
					Animals dead	Frequency	%
Tryps & Lymphangitis	2	1.7	2	1.7	1	30	25.0
					2	10	8.3
					3	5	4.2

* N= Numbers of respondents

of occurrence (Table 2). The current study also revealed that Lymphangitis was the first killer disease for which 50.8% of respondents under this study reported that their animals were dead due to this chronic disease [16]. About 15.8% of the surveyed cart-equine owners also reported equine colic as the second most common problem and second killer disease (Table 3). Among most commonly used cart-equines of the study area, horses were the most vulnerable animals that, in the last 12 months of the study period, 37 animals dead among 48 animals died were horses (Table 2).

The extended, bleeding and non-healing wounds created due to lymphangitis (Fig. 2) affect the gait and working efficiency of cart-equines due to pain and lameness happening to the limbs of animals. The wound also affected the working time of cart owners because of a long time it takes for treatment and the animal to heal, the problem also hampered animal welfare at large. The misuse, mistreatment and lack of general and veterinary care also contributed in no small amount to the early death of working equids. In contrast to the report by Solomon *et al.* [10] where 30% of working equids wear rubber shoes in Ethiopia and the majority of horses were shoed, with iron horse shoes, by their owners (70%) and the remaining 30% by a farrier, every 15 or 30 days (25% and 38% respectively) [17] in Southern Chile, the use of shoe of any type was uncommon in this study areas. Foot rote that affect working equines of the study area might therefore, took the advantage of lack of protective cart-equines' foot-shoe and the wet and muddy earth happening in the area due to extended rainy season. Cart equine drivers of the study were also prevented from using main and asphalt roads that oblige them to use other roads most of which were not convenient for animals to walk and pull cart properly. Road inconvenience therefore, led animals to hoof tear and difficulty in pulling.

Summary and Conclusions: Young age, lack of driving skill and inefficiency of farriers in the current study area showed poor husbandry practices with esteem to handling, housing and feeding of cart-equines. Cart equines were also obliged to work for an extended time per working days, even while their back, legs and chest were wounded and bleeding. The terrain topography, mainly in Nekemte town in addition to inappropriate harnessing equipments used and lack of hoof shoes porn animals to mechanical injuries and cart-pulling inefficiency. Equine epidemic diseases mainly lymphangitis, trypanosomosis, equine colic, internal and external parasitic diseases and mechanical wounds resulted in loss of working animals and shortens the service age of cart equines.

Lack of market and seasonality in market opportunities were some of the major problems that poses cart-equines to an extended working time per working days. Extended working time may also led animals to lack of sufficient feeding time, extreme friction between animal body and harnessing and to animal fatigue. Lack of appropriate policy with regards to animal welfare in general and cart-equine welfare in particular is also another drawback to cart-equine husbandry and health improvement.

Recommendations: To improve the productivity of cart-equines in the area, strategic training of farriers and cart-equine owners on cart-equine handling, horse-shoe making and disease prevention needs to be implemented. To make lasting improvements to the welfare of working equines in Ethiopia, it needs to persuade key local, national and international institutions and the government to include the welfare of working equine animals in their livestock development policy and program.

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