

The Welfare Issues of Working Equine in Ethiopia: A Review

¹Temesgen Zekarias and ²Sitota Tesfaye

¹Researcher at Ethiopian Institute of Agricultural Research, Addis Ababa, Ethiopia

²Animal Health Expert, Livestock and Fisheries Development Office,
Kucha Woreda, Gamo Zone, Ethiopia

Abstract: Africans livestock owners do not realize as animals are sensitive to beatings and mistreatment. As many African countries, Ethiopia has not formulated regular ways of awareness creation to the public and is not endorsed to the community what the minimal animal welfare standards to be esteemed. The issues of animal welfare in Ethiopia go to King Minilik II, yet the country lack practicing and enforcing the laws until present time. Despite the fact huge number of livestock present in the country, welfare were not well kept, hence poor productivity and production is a common feature of the sector. Equine is one of livestock species often owned by people who belong to the poorest section of society, which results in that the animals are forced to work hard without adequate resources as feed, water, veterinary service and appropriate loading equipment. Consequently, the working Equine in Ethiopia suffers from multiple welfare problems. The application of improved technology and better management through better feed and health services and improved design of agricultural implements and carts could considerably improve the welfare of these animals as whole and equine in specific. Improved systems would generate sufficient benefits for the economy to justify the required investment. High priority should therefore be given to draught animal power in the economic development agenda.

Key words: Draught Animals • Management Practices • Poor Community

INTRODUCTION

There are an estimated 90 million equine in the developing world, with the highest population concentration in central Asia and north and east Africa [1]. Over 90% of all donkeys and mules and 60% of all horses are found in developing countries [2] with the majority of these being used for work. Recent information to the situation regarding the contribution of draught animal power to the economies of developing countries is scarce, although in 1998, it was estimated that working animals, including horse, produced 75% of traction energy in the developing world [3] and it has been suggested that more than half of the world's population depends on animal power as its main energy source [4].

Ethiopia has the largest population of equine in Africa and the second largest equine population in the world after China [5] and equine plays significant role for the resource-poor communities in the rural and urban areas; donkeys are of greatest importance [6]. In Ethiopia,

there are an estimated 5.2 million donkeys, 2.5 million horses and 0.5 million mules [7]. Ethiopia possesses approximately half of Africa's equine population with 37%, 58% and 46% of all African donkeys, horses and mules, respectively [7].

Equine are commonly used to transport different products such as crops, vegetables, water, fuel wood and livestock feed [8] and for many families the donkey is a very important source of the income [9]. In some areas, the roads are of low quality and motor vehicles are unsuitable for transportation, consequently people are highly depended upon donkeys to transport essential products such as firewood and water. They appear to be an affective in assisting women both in domestic responsibilities and income generation activities, which otherwise they may not have had, access [10].

Specific to donkeys, donkeys are still one of the most important draught animals playing a key role in the agriculture economy. Donkeys are considered better than other draft animal because of their inherent tolerant for

dehydration, low sweating rate and good thermo-ability. Recurrent drought in Ethiopia resulted in increased cattle mortality and increased donkey usage as a draft and pack animal in both rural and urban areas. They account for over 50% of animal energy scenario in the country. Donkey is more adapted to the Ethiopia terrain than either the mule or horse [11].

The study conducted in South Nation and Nationalities of Ethiopia by the Brooke association in the contribution of donkeys, horses and mules to people's livelihood indicated that the economic and social contribution of Equine to the livelihoods of societies, especially the poor, in terms of creation of employment opportunities, access to finance and local transportation are enormous. The net returns from equine use are significantly higher than the total costs, showing equine in the small holder communities are very useful whether it is for exclusive own use or for income generation. Donkey assists poor households with income-generating opportunities and has contributed in improving access to finance. Spending by households of cash income from the rating out of equine and gharry and cart services on other rural services such as crop or livestock agriculture offers realistic ways of obtaining returns from agriculture above mere subsistence agriculture, which is highly susceptible to climatic risk, diversification into non-farm activities could be the most appropriate solution [12].

As the welfare of animals, equine need to be protected to live peacefully in their environment without affecting their health and welfare. They must not be neglected to have access for feed, water and shelter or abused by beating and harming and deprived of freedom of movement and exercise [13].

According to the World Veterinary Association (WVA), animal welfare is defined as a scientific discipline which incorporates "Applied aspects of etiologic, bioethics and the concepts of suffering and wellbeing" [14]. In simple term, welfare can be defined as 'well-being' and the accepted definition of welfare is that of 'Five Freedom' which are freedom from hunger and thirst by providing ready access to fresh water and diet to maintain full health and vigour; freedom from discomfort by providing an appropriate environment; freedom from pain, injury or disease by prevention or rapid diagnosis and treatment; freedom to express normal behavior by providing sufficient space, proper facility and company and also freedom from fear and distress by avoiding mental suffering. The health and welfare of an animal is determined by its physical and mental state, including physical fitness of the animal [15].

Animal welfare is a multi-faceted issue, which implies important scientific, ethical, economic and political dimensions [16]. Animal welfare as a 'formal discipline' started with the publication of the Brambell report on the welfare of farm animals, issued by the British government in 1965 [17]. Here study of animal welfare includes husbandry and human-animal interactions, the multi-faceted approach has to include collaboration between the natural and social sciences.

Despite their high population of equine and prominent role in Ethiopia agriculture, much has not been done to study the physiology, nutritional requirement, health problems and management requirement. Donkey in Ethiopia at least in the donkey health and welfare project (DHWP) operation sites are subjected to variety of health disorder including multi parasite, back sore and other wounds, hoof problems, colic and various infectious diseases such as strangle, tetanus, Africa horse sickness (AHS) and others [12].

Many of the working equine are owned by poor people and the animals' needs are often ignored. The equine are forced to work in harsh environments without sufficient resources (e.g. food, veterinary treatment and shelter) and appropriate equipment may not be prioritized [18]. Studies have shown that working equine suffers from animal welfare problems such as gait abnormality, joint swelling, broken skin, deep lesions [19] and dental problems [20]. When their health deteriorates and they are unable to work they are usually abandoned and left to die [9]. Despite the equine have an invaluable contribution to the people in Ethiopia the equine, specifically donkey is the most neglected animal and has a very low status [21]. Therefore the objective of this paper is to review on the distribution & importance of equine, constraints, measurements and assessment of welfare in Equine.

Distribution of Equine: There are an estimated 90 million head of Equine in the developing world, with the highest population concentration in central Asia and north and east Africa [1]. Over 90% of all donkeys and mules and 60% of all horses are found in developing countries [2] with majority of these being used for work.

Ethiopia is a country with a highest equine population, specific to donkey, donkey population in the world that is estimated to be 6.5 million. In Ethiopia, there are an estimated 5.2 million donkeys, 2.5 million horses and 0.5 million mules. Ethiopia possesses approximately half of Africa's equine population with 37%, 58% and 46% of all African donkeys, horses and mules, respectively [7].

lthough equine are widely distributed in all the ecological zones (Arid to alpine) in Ethiopia the majority of the donkeys are found in the high land parts of Ethiopia that densely populated in three regions, Oromia (44%), Amhara (34%) and Tigray (19%). About 85% of farmers in the high land of Shewa own donkeys, with an average of 2.7 per households. In Tigray 49% of farmers keep donkey with an average number of 1.5 per family. In Dire Dawa and East Oromia, 70% of small holders keep one donkey per family. Female donkeys are the most numerous it is about 70 %. In Addis Ababa the capital city of Ethiopia as many as 3000 donkeys are found. Particularly in Merkato grain market transporters generally own between two and five donkeys each transports about 100kgs [22].

Importance of Equine: The majority of working animals are owned by individuals who use them as their sole means of income to sustain often large and extended families. In developing nations where 96 percent of all donkeys and 60 percent of horses are found [15, 18] hundreds of millions of impoverished people depend on equine for their livelihoods, from transport of water to attractions for tourists. The amount of draught power which can be delivered by an animal depends on the species, breed and size and body weight. The amount of power also varies in accordance with a number of other factors, including, quality and quantity of food and nutrition provided. Up to 20 people can be dependent on each animal for their daily survival [23].

In addition to their traditional role as pack and riding animals, equine, most notably donkeys as they are cheaper than oxen and more resistant to droughts, are increasingly used for light cultivation tasks, threshing, drawing water and carting. In the developing world, they are the most important source of agricultural energy and transport for resource-poor communities in both urban and rural areas [21, 24]. Indeed, research suggests that working animals supply approximately 50% of agricultural power needs globally [24]. Although draught animal power has been superseded by tractors on many of the large commercial farms in Africa, it remains a relevant farm technology in small-scale agriculture, mainly for economic and agro-ecological reasons. Purchase and maintenance costs of tractors are high in many of the sub-Saharan African countries, whereas animal power is cheaper, locally available and easy to maintain when compared with motorized forms of power. Some cultivatable areas, particularly on hillsides and in steep valleys are inaccessible to tractors and can only be worked by animal or manual power [25]. The majority of farmers in

sub-Saharan Africa including Ethiopia practice small-scale mixed farming on areas of less than four hectares. For these people draught animal power offers a feasible alternative power source to manual power in the cultivation of food crops and cash crops. Animal power was introduced in the sub Saharan Africa over the last century and its use has been increasing in recent years, however, manual labour still predominates.

People provide 89% of the power used in land cultivation, while draught animals supplied only 10% of the farm power input. Therefore, for sub-Sahara Africa and many developing countries, draught animals, technology has been qualified as an ecologically sustainable means of increasing agricultural production, reducing human drudgery and improving the quality of rural life. There is a need to promote the use of draught animals in sub-Saharan Africa to fill the gap between the deteriorating levels of food production and the increasing demand for food [26].

Poor infrastructure and very rugged topography in many part of rural Ethiopia have made transportation vehicle inaccessible. Hence, farmers use alternative means like draught animals especially, donkeys to combat transportation problems [27]. They are the key means of transportation in poor nation in less infrastructure areas by which in agriculture and food distribution systems. Equine transport vehicles enabled small farmers to establish wider contacts with traders, improved access to markets and allowed them to increase production and profits. Donkeys played significant role in helping to empower women in many developing nations [28]. As united nation (UN) predicted that the population of least developed countries will double from 804 million to 1.7 billion by 2050. Thus, the use of working equine, in developing countries increased [29]. Due to these increasing human populations in Ethiopia demands equine for transport of crops, fuel wood and water, building materials and people by carts or on their back from farms and/or markets to home. In most zones of Ethiopia, donkeys are primarily used as pack animals. They work from 4 to 12 hours/day, depending on the season and type of work and also pull carts carrying heavy loads 3 to 4 times their body weight [21].

Constraints of Equine Welfare: Animal's health is a part of animal's welfare. When an animal health is poor, so its welfare, but poor welfare does not always imply poor health. There are many circumstances where behavioral or physiological chopping mechanism is activated indicating that welfare is poor, but animal health remains good. Body damage and the disease, which refer in this

case to infectious disease, indicates that poor welfare. The prevention of normal physiological process and anatomical development will also indicate poor health where these phenomena can be shown to be symptoms of an infectious, metabolic or nutritious disease. Mortality rates also an indicator of welfare in general and health in particular in many circumstances. When animals are closed to death, welfare and their health will often be very poor. Other indicator of poor welfare, though not signs of poor health at that time, may indicate risk of poor health in future. This include immune suppression, which renders an animal susceptible to infection to the chronic activation of physiological chopping mechanisms, which may cause immune suppression; and certain behavioral pathologies and redirected behavior which can result in serious injury or predisposing to infection, either in the animal itself or others. It is these measures the review focuses on, poor welfare proceeds poor health and is instrumental its deterioration [30].

Despite their use, the husbandry practices of working equine especially of donkeys are poor. Equine are not provided with feed supplements. Feed shortage and disease are the major constraints to productivity and work performance of equine. Loading without proper padding and overloading for long distances causes external injury to equine especially to the donkeys. They are brutally treated, made to work overtime without adequate feed or health care indicating their poor welfare status [31].

Shoeing practices are important to the welfare of donkeys. However, high percentages of shoeing abnormalities are seen in developing countries where there is poor quality of service and low skill levels of the farriers due to a lack of farriery training courses in many developing countries [32].

Wounds are also one of the welfare concerns of working equids [33]. Wound is characterized by pain, gaping, bleeding and functional disturbance [34]. The type of wound in working donkeys includes tissue damage with or without factors blood/exudates/ pus, abscess formation, or any secondary bacterial complication. Bites (Lacerated wounds) will be identified by irregular edges underlying tissues removed as well as hemorrhage [35]. The most common cause of these wounds in working equine are over loading, improper position of load predisposing to falling, beating of donkeys, hyena bites, donkey bites, injuries inflicted by horned Zebu [34]. Some hobbling methods, inappropriate harnesses or yokes that may be heavy and ragged, long working hours may cause discomfort and inflict wounds [31].

Constraints such as poverty and lack of knowledge mean that animal welfare is being compromised internationally. When working donkeys can no longer work, the owners lose their livelihoods, either temporarily or permanently. Research conducted in Ethiopia demonstrated that improvements in the welfare of small donkeys had significantly improved their work output which in turn improved livelihood situations of the poorest communities in the rural and peri-urban areas [36]. The welfare of working equine in developing countries is therefore crucially important, not only for the health and survival of those animals, but also for the livelihoods of those people dependent on them [15, 37].

In Ethiopia demonstrated that the -importance of improved work output of the donkey is achieved through improvements in the donkey welfare. Thus, adoption of good donkey health, welfare and working practices is among the most important ways that people in poor countries can help, secure and improve their incomes [32].

Measuring of Equine Welfare: To talk about animal welfare it is crucial to see it from perspectives such as biological, elective and natural state point of view. According to Mellor *et al.* [38], the biological state describes the animals' health growing and reproduction situation as a parameter of welfare; the elective state: stresses potential for animals to suffer or to have positive experiences and the natural state compares the differences between captive animals and the wild state where they origin from and to what extent they are able to express natural behaviors. Other fundamental bases for maintaining animals welfare sustainability are the five freedoms outlined in the 1970s in England and have since then been the central basis for animal welfare all over the world according to FAWC [39]. These five freedoms includes Freedom from hunger and thirst by providing constant access to fresh water and a diet to maintain full health and vigor, Freedom from discomfort; by providing an appropriate environment including shelter and a comfortable resting area, Freedom from pain, injury, or disease: by prevention or rapid diagnosis and treatment, Freedom to express normal behavior: by providing sufficient space, proper facilities and company of the animal's own kind and Freedom from fear and distress: by ensuring conditions and treatment, that avoids mental suffering.

Working equine 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 [23]. When one observes injuries signs, such as self-mutilation, or chronic stimulation of the autonomic nervous system indicates clearly as there is a lowered animal welfare. In another approach, welfare of an animal said in good conditions when stress responses not chronically activated and when the individual can cope with them successful [40]. Long working hours and difficult conditions are experienced by donkeys and horses working in the different part of the country. Animals are often engaged in work for long hours and when get free, they are left to browse and feed on garbage. These have a potential to affect negatively their welfare and quality of life. This misuse, mistreatment and lack of veterinary care for equine have contributed enormously to early death, majority of which currently have working life expectancy of 4 to 6 years. However, in countries where animal welfare is in practice, the life expectancy of equine reaches up to 30 years [41].

Welfare Assessments in Equine

Life Expectancy: Equine 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 [9]. In a study by Kumar *et al.* [20] the average age was 7 years and only 4.4% were older than 15 years. The same study also showed that young equine worked with the same activities as older equine which can lead to poor health for the young Equine. 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 [20].

Feed Management: The proper nutrition of draught animals depends up on the amount of labor performed i.e. the heavier the work, the greater should be the amount of easily digestible carbohydrates in the ration. The most obvious extra requirement for draught animals is for energy. This extra energy can have different values according to the use to which the absorbed nutrient energy is put. The determinants of feeding strategies for draft animal in semi-arid areas include the availability and feeding value of feed resources, the type and duration of work animals perform the climatic environment and farmers' objectives. Scarcity and low quality of feeds available during the long dry season are the main constraints facing farmers keeping draft oxen in semi-arid

areas. A high level of supplementation with a good quality of food is required to maintain an animal's live weight and to support a certain level of production [26]. A study done by Kumar *et al.* [20] in Mekelle city Northern Ethiopia on donkey showed that as they are forced to work under poor body conditions and having wounds in the body parts of donkey. The research indicated that the donkeys' wound also associated with the work type they are performing. Another study at Meskan District by Mekuria and Abebe [42] in southern Ethiopia showed Equine forced to work frequently without proper care and handling in body conditions, having lesions in different body parts.

Body Condition: Equine with poor body condition had higher chance of harboring the parasites. This could be due to the fact that animals with poor body condition might be immune compromised probably due to malnourishment and higher workload and as a result be exposed to parasitism. On the other hand, poor body condition score could also be due to the parasitism and in such case, body condition score is considered as a dependent factor not as a risk factor. However, we consider it as a risk factor for the parasitism under consideration. More prevalent helminthes parasites were in animals with poor body condition than well condition ones and similar work was reported by Ayele *et al.* [32].

Wounds and Injuries: Based on study done by Mekuria *et al.* [31] in Hawassa town, equids were shown a poor welfare situation in the area. Equids were highly subjected for intense drought and packing condition as a result, it is injuries, wounds were observed at tail, ribs, breast and hindquarters while at the same time, rubber shoeing was found to be of poorest quality, thus leading to high slip hazard in Hawassa town. The lesions indicated above associated with work type and body condition show that working equids experience multiple welfare problems in general.

Harnessing and Hitching: Avoidable skin wounds are a source of continuing frustration for those concerned with equine health and welfare. There is often a sense of despair those equine users fail to make a cause and effect link between a protruding piece of wood or metal and a wound on the equine. Many groups have sought to produce improved harnessing but their cost and complexity has almost always led to their rejection by equine users. Legislation has also failed in several countries to improve the standards of harnessing.

Happily there are examples (eg, Northern Province, South Africa) where breast band harnesses that cause fewer saddle sores have been produced at a lower cost than those normally available for sale in the markets. Work on improving carts is most likely to be successful where modifications to existing designs are attempted rather than the introduction of a markedly different design. Attention to simple braking systems on existing designs could markedly reduce the number of injuries equine suffer in hilly areas. The webbing breast band made from strips of webbing which are sewn together to fit the equine. The width of the breast band is about 6 cm. The neck strap is 4 cm wide and not adjustable. Leather parts are used to reinforce the breast strap at the connections with the neck strap and the triangular ring. Short breast bands with one neck strap have the advantage of connecting the traces near the power point [43]. The short and the long breast band harnesses are promoted for their simplicity and durability. They are made out of conveyor belts or other belt material. The short breast band is longer than the one discussed above, since it has two back straps. The front back strap should be joined to the breast strap at power point [44]. Three-pad collar harnesses are expensive compared to harnesses discussed previously, because they are produced by artisans using good quality materials like hardwood, leather and canvas. However, over one thousands of them have been made in Kenya on demand and those who can afford them like them very much for their comfort, power, efficiency and durability [45]. The efficient utilization of animal-drawn implements depends on the effective deployment of the animals' strength and muscular energy. Such deployment is inevitably influenced by the harnessing system. Poor harnessing results in a reduction in animal implement performance through needless energy losses [46].

Health Condition: Equine also harbor a large quantity of parasite that prevail in the GIT including round worms (Families: Strongylidae, Spiruridae, oxyuridae, Trichostrongylidae and Ascaridae) and tapeworm (Family: Anopiocephalidae) which act up and damage the intestine depend on the age and natural defense of the individual equine [44]. As Svendsen [35] reported that infectious diseases which can affect welfare of working Equine include African horse sickness, epizootic lymphangitis, rabies and trypanosomosis.

Factors Affecting Perceptions of Equine Welfare

Geography and Environment: Poor infrastructure and very rugged topography in many part of rural Ethiopia have

made transportation inaccessible. Hence, farmers use alternative means like draught animals especially, donkeys to combat transportation problems [27]. Due to these increasing human populations in Ethiopia demands Equine for transport of crops, fuel wood and water, building materials and people by carts or on their back from farms and/or markets to home.

Culture and Tradition: Hobble donkeys i.e. tie two legs together with a short rope, is commonly performed to prevent the donkey from wandering off [33]. Hobbling the donkey in an unsuitable way can cause discomfort and wounds [47] 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 [33].

It is recommended that a donkey should not carry more than one third of its body weight (i.e. between 40 -80 kg, [33] but studies in Ethiopia show that donkeys carry loads between 60-100 kg. In markets in Addis Ababa, it is not uncommon to find donkeys carrying packs of 100 kg [9] and in southern Ethiopia, donkeys have been observed traveling up to 70 km per day while carrying an average workload of 150 kg [21].

When an equine's health deteriorates, the owners use different treatment strategies. Studies in Ethiopia show similar results; most unhealthy equine 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 [20, 21]. An example of traditional remedies that are used, by the owner or a local healer, is pouring plant juice or oil on the donkeys which negatively affect the welfare of working equine.

CONCLUSION AND RECOMMENDATIONS

Working equine were experiencing multiple welfare problems and the major constraints that contribute for poor welfare treatment were lack of good management practices, harnessing problem, over loading and over working, disease and lack of veterinary service program, lack of balanced nutrition and wound. The major thrust in draught animal welfare should be improvement of the productivity of draught animals through scientific and technological inputs. The large investments required would fortunately be readily justified. Considerable socio economic benefits would accrue to those developing countries which now depend on draught animal power. There would be a good rate of return to owners of draught

animals and to society as a whole. Political and professional decision-makers often take the view that draught animal power is a transient phase, which therefore requires no improvement and will naturally disappear, in time, to be replaced by other technologies. Very low priority is given by scientists and technologists to research in this field. Politicians take little interest, as the subject of draught animals attracts little public attention. Education systems and media avoid the subject. Neglect of draught animal power by these sectors is understandable, but similar neglect by development officials is regrettable. Draught animal power will continue to be the main source of energy for many years to come in the developing countries. Based on these conclusions the following recommendations can be forwarded. It is imperative to increase the awareness of owners and users in regard to these unresolved issues. Education systems and media should give emphasis to welfare of working equine. Further investigations on the risk factors associated with equid welfare are warranted as to improve the situation of these working animals. This study suggests initiating training programs aiming at accustoming owners and users to improved harness material, adequate bits, alternative shoeing procedures and correct behavior. Political and professional decision-makers often take the view at these draught animals and should accept this reality and should consider drought animals. Technology and management inputs are needed to improve the productivity of draught animals.

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