



Assessment of Welfare Status of Working Equids of Kathmandu Valley and Chitwan District Using Health and Behavioral Parameters

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Abstract

Horses, donkeys, and mules are the most reliable and commonest method of means of transportation serving as an integral part of most underdeveloped and developing countries of the world. They are known as the economy booster for the marginalized people mainly among poor, backward, and marginal peoples of various countries in Asia, Africa, and Latin America. Nepal is also among the country in which equines contribute greatly for increasing and improving the livelihood of remote people of Hilly, Himalayan and Terai region for the people who earn less than a dollar per day. It is estimated that there are 112 million working equines among these developing countries that benefit 3.5 to 13 million people worldwide. The number of working equine population counts more than a lakh in Nepal. Kathmandu holds more than 1500 working equines at various 125 brick kilns and the Lalitpur district alone holds more than 650 working equids in brick kilns. 85% of donkeys outside the capital valley have open wounds in their body due to excessive workloads. It is estimated that only 3 - 5% of working equines are at the reach of veterinary specialists all along with Nepal. Guidelines notes to accompany working equine welfare assessment developed by Bristol University were followed to conduct the welfare status of the equine. A total of 175 equines were accessed by a single observer at various six sites of three districts of Nepal. The study revealed that working equids in Nepal especially for carriage and at brick kilns are far below in terms of welfare, health and behavior standards. Unequipped and miserable shelters, low-level diet, lack of appropriate care, excessive workload, uneducated owners, lack of health services were common with working equines whereas, the equines owned by Nepal Army had a fair high-level welfare standard as recommended by OIE.

Keywords: Working Equids; Health; Welfare; Equine Standards; Nepal

Introduction

Since long ago animals are used for transportation of goods and materials and people, agricultural drought purposes, and other various household works. Undoubtedly, working animals are serving humans since the time of early civilization [1]. Animal power along with humans was the long way cooperation to ensure today's

rapidly developing world [2]. Contrary to the popular view that working animals are old fashioned and irrelevant in the 21st century, their numbers are stable in many parts of the world increasing in others as human population demographics, global economic issues, and a changing environment underlying their importance in sustaining the livelihoods of farmers, pastoralists and the urban

and rural poor people [3]. Horses, donkeys, and mules are the very reliable and commonest method of means of transportation which is an integral part of transportation in most developing countries of the world [4]. Equines are known as the economy booster for the marginalized peoples among poor countries and serve as the backbone marginal peoples of countries in Asia Africa and Latin America (Wanepoel., *et al.* 2008). Working equines are considered as the main working animals after cattle worldwide [5]. It is estimated that there are 112 million working equines among these developing countries [6]. Nepal is among these countries in which equines contribute hugely for increasing and improving the livelihood of the places of backward people of Hilly, Himalayan, and Terai region. It is estimated that around a hundred thousand equines are employed all over Nepal that plays a vital role in supporting the livelihood of around one million people [7]. Equine welfare is a major issue of debate among animal workers and owners for a long time in Nepal too. The standard of welfare for working equines is in miserable condition among all developing countries are far below in terms of welfare and behavior as recommended by One Health International [8]. Traction animals are often neglected in the allotment of resources such as shelter, food, and appropriate harnessing as they are usually owned by the poorest section of the society [9]. Over (95%) of all donkeys and mules, and (60%) of all horses are found in developing countries and it is not a doubt that the maximum numbers of these equines are used for working purpose [10]. Today draught animals and humans provide (80%) of the power input in farms of the developing countries [11]. Though equine serves majorly for the economic upliftment of the owners and its related stakeholders, the level of comfort is always being compromised due to various causes like availability of limited resources, marginal area, illiterate owners, altered geographical landscape, and unavailability of the medical facility. Capital city Kathmandu only holds 125 brick factories in which 1500 equines work for inside the yard of brick industry and are also major cause for deteriorating the air quality of Kathmandu Valley by emitting a heavy amount of sulphur dioxide in the atmosphere [7]. Every year more than 25 equines die due to merciless overwork at the brick factories inside Kathmandu valley and only less than (3%) of equines that reside in urban areas are at the reach of the medical facility in Nepal [7]. We can experience the condition of the working equines living in marginal and rural areas of Nepal as miserable and inadequate health and management provisions.

Welfare assessment systems can be broadly categorized into animal-based or resource-based measures and different applications tend to draw from one or both of these types of measures [12]. Generally, two methods are used for the assessment of equine welfare which includes direct observation and scoring system and record-based observation system [13]. Record based system for the evaluation of animal welfare has been old-fashioned, unreliable, and irrelevant in the context of today's world [14]. Health and behavior aspect is an important factor to determine while assessing the welfare of the animal [15]. The direct method of assessing the welfare of equines with the observation of various parameters of the body in the presence of animal and welfare assistor is found to be a more relevant and reliable method of assessing equine welfare [16].

Materials and Methods

Welfare assessment protocol

The welfare assessment protocol developed by [17], with the modification made by Brooke University, U.K was the starting point of this research. A checklist with forty-one observations of health and behavioral along with the date, observer, and geographical region with additional single space for the remarks was used for scoring the body and behavioral parameters by the descriptors.

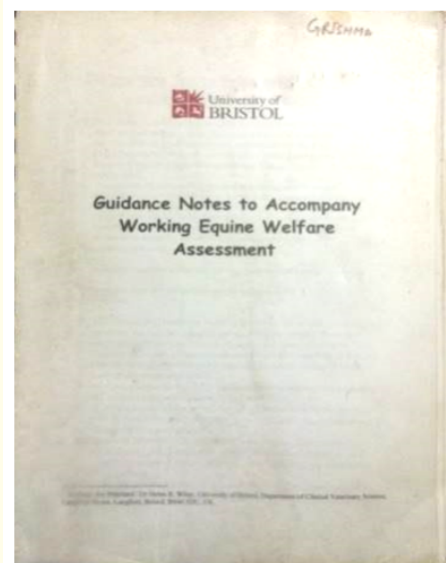


Figure 1: Guidance protocol.



Figure 2: Checklists for scoring.



Figure 3: Collection and scoring of data using a non-invasive method.

Equines and data collection

Data were collected in the checklist as per the protocol and were filled in a paper with the use of a pencil. The parameters were observed in the presence of animals and observers based on the following categories, behavior, and general health parameters, body condition, limb disorder, and lesions of skin and deeper tissues. The parameters were detailed and described with figures with the scoring system. The various parameters were observed and were matched with the photographs in the protocol and scores were recorded in the checklist. The average time taken to access the single animal was 8 - 10 minutes.

Duration of study

The study will be of five months duration, starting from December 2016 to April 2017 with the baseline assessment of working equids of six different sites of Kathmandu valley and Chitwan district.

Working equids welfare assessment

Based on the data available and literature review there is no accurate data about the population of the working equids in Nepal although based on the local knowledge and data provided by the Nepal government can be estimated to a fair level. Within the species, the animal was accessed and scored with the various descriptive, behavioral, health, and body condition parameters.

Statistical analysis

After the completion of the fieldwork at various six sites of Nepal, data entry was done using Microsoft Excel (2011), data handling and analysis were done using (SPSS Version 2.0) static software. The overall level of significance was considered as (P < 0.05) or lesser.

Results

Animal sampled

Sex	Donkey	Horse	Grand
Gelding	16	40	56
Mare	3	82	85
Stallion	1	33	34
Grand Total	20	155	Total: 175

Table 1: Description of sex, and species of equines assessed in six various sites of Nepal.

The significant association between health and behavioral parameters and working equid species

The primary intention was to analyze the obtained data according to the working equid species. i.e. horse, donkey, and mule. As the number of mules was too low to be considered for the analysis, the species mules were excluded from the data. Hence, analysis of the correlation between the species was done between horse and donkey only.

Observation of behavior	Donkey	Horse	Significance
General Attitude			
Alert	85%	85%	NS
Apathetic	10%	19.9%	
Severely Depressed	5%	1.9%	
Response to observer approach			
Moves Away	10%	8.4%	
Turns Head Away	15%	23.3%	NS
Does not Moves	15%	13.6%	
Turns Head towards Observer	60%	43.5%	
Aggressive	0%	11.1%	
Walking Downside of the animal			
No Interest	25%	42.2%	NS
Sign S of interest	75%	57.8%	
Chin Contact			
Accept	15%	44.8%	(S @<0.05)
Avoid	85%	55.2%	
Lesion at corner of lips			
No lesion	80%	98%	(S @<0.01)
Lesion Present	20%	1.9%	
Mucus Membrane			
Normal	70%	44.8%	NS
Abnormal	30%	55.2%	
Eyes			
Normal	65%	90.2%	(S @<0.01)
Abnormal	35%	9.74%	
Body condition Score			
Very thin	0%	1.23%	
Thin	35%	7.14%	(S @<0.01)
Medium	60%	59%	

Fat	5%	29%	
Very Fat	0%	2.76%	
Coat Health			
Healthy	80%	78.6%	NS
Unhealthy	20%	21.4%	
Signs of fecal soiling			
No fecal soiling	80%	91.5%	NS
Fecal soiling present	20%	87.4%	
Skin Tent Duration			
No loss of elasticity	85%	78.6%	NS
Loss of Elasticity	15%	21.4%	
Signs of heat stress			
No signs of heat stress	100%	96.7%	NS
Sign of heat stress	0%	3.25%	
Signs of firing			
No lesion	100%	88.9%	
Exterior/healed	0%	10.3%	NS
Deep lesion	0%	0.65%	
Signs of limb tethering and hobbling			
No lesion	95%	94.1%	
Exterior/healed	5%	5.19%	NS
Skin broken	0%	0%	
Deep lesion	0%	0.6%	
Lesion on the skin and deeper tissue			
Head			
No lesion	85%	64.3%	NS
Lesion present	15%	35.7%	
Ear			
No lesion	95%	72.7%	NS
Lesion present	5%	27.2%	
Neck			
No lesion	100	81.1%	NS
Lesion present	0	18.8%	
Breast and shoulder			
No lesion	100%	85%	NS
Lesion	0%	14.9%	
Withers and spine			
No lesion	90%	77.2%	NS
Lesion present	10%	22.7%	

Girth and belly			
No lesion	95%	93.5%	NS
Lesion present	5%	6.5%	
Ribs and flank			
No lesion	90%	83.7%	NS
Lesion present	10%	16.24%	
Hindquarters			
No lesion	80%	85%	NS
Lesion Present	20%	14.9%	
Tail and tail base			
No lesion	90%	90.2%	NS
Lesion present	10%	9.74%	
No lesion	85%	88.9%	NS
Lesion present	15%	11.0%	
Hind leg			
No lesion	85%	85.7%	NS
Lesion present	15%	14.2%	
Ectoparasite			
Present	100%	94.1%	NS
Absent	0%	5.85%	
Knee lesion			
Present	100%	95.4%	NS
Absent	0%	4.55%	
Point of hock joint			
No lesion	95.5%	92.8%	NS
Lesion Present	5%	7.15%	
Swelling of flexor tendon			
No swelling	75%	90.9%	NS
Swelling present	25%	9.1%	
Cow hock confirmation			
Normal	90%	92.2%	(S @<0.01)
Abnormal	10%	7.80%	
Hoof shape			
Normal	40%	85.7%	(S @<0.01)
Abnormal	60%	14.3%	
Hoof horn quality			
Normal	85%	91.5%	(S @<0.01)

Abnormal	15%	8.44%	
Sole shape and structure			
Normal	90%	72.7%	
Abnormal	10%	1.95%	(S @<0.05)
Closed shoe	0%	25.3%	
Gait			
Normal	90%	90.9%	NS
Abnormal	10%	9%	

Table 2: Significant association between health and behavioral parameters and working equid species.

Acceptance of chin contact by the animal with a response to the observer eliciting the friendly behavior was more prevalent in the horses (44.8%) than of the donkeys (15%). Whereas, the prevalence of lesions on the commissure of lips was much greater in donkeys (20%) than in horses (1.95%). Results showed that there was a higher prevalence of eyes problem with the donkey (35%) than with the horses (9.74%). The body condition score showed that the prevalence of the backbone and pelvis covered by fat including rounded pelvis which is considered as best for working equids was found to be only (5%) with donkey whereas it was found to be (29%) with the horses. The prevalence of normal hoof shape was found to be (40%) with the donkey and that of the horses was found to be (85.7%). Prevalence of the presence of closed shoes which is considered as the safety device for preventing hoof problems and aids for walking was found to be higher in the donkeys (25.33%) than that of the horse which was null.

Discussion

The equines of donkey sanctuary Lalitpur and Nirvana Resort has the least mean average BCS among all accessed equids. The Nepal Army cavalry has the highest BCS scoring that is (3.5) which is also fairly good scoring among the other equids accessed. Burn., *et al.* (2010) suggests that BCS was a useful indicator of the other welfare problems; slim animals had greater problems of having skin lesions, firing lesions, gait, parasite and appeared to be apathetic. Beyond minimum suffering, the importance of welfare status is inclining nowadays as the sector accepts that the animal require a positive experiences for a quality life [13]. This study shows the value of several indicators of welfare status of working equines

Place	Mean	N	Std. Deviation
Bharatpur Stud Farm	3.0486	72	.47590
Cavalry, KTM	3.5250	40	.53048
Donkey Sanctuary	2.4000	20	.34793
Narayanhiti, KTM	2.6364	22	.69320
Nirvana Resort, Chitwan	2.4000	5	.65192
Sauraha, Chitwan	2.7188	16	.65749
Total	2.9829	175	.64304

Table 3: Correlation of BCS of working equids with the various sites.

supported by numerous health and behavioral parameters and their correlation. Of course, this does not signify the achievement of a standard welfare indicator but can be an accountable basis for further related researches and studies. The results at the point of significance were only considered for the discussion as it validates the correlation at a particular level. The response of an animal to the observer with the parameter, chin contact has significance at every two aspects of data analysis that are; within the species (both having significance ($P < 0.01$)) and work type (significance at $P < 0.05$). The body condition score (BCS), considered as one of the important welfare parameters was found to be significant for both aspects of correlation of data analysis ($P < 0.01$). BCS score of 3 is considered as best during welfare assessment [18]. The prevalence of lips problem was found with species and work-type with significant (both having $P < 0.01$) and housing ($P < 0.05$). The proportion of animals having flexural lameness includes the shape and quality of hoof and sole relating parameters with cow hock confirmation was found to be also significant ($P < 0.01$) with both aspects. The health-related parameter heat stress in the checklist which dealt with the level of stress and amount of rest with the working equids had significant level housing and work-type with ($P < 0.01$) which resulted as TPC equids which are worked as carriage puller were given least rest and was continuously used for work. Pack donkeys had a major problem with cow hock conformation, hoof shape, hoof horn quality (all significant at $P < 0.01$), and shole shape and structure (significant at $P < 0.05$) which directly links with the locomotion parameters with an indication of greater workload within the species.

Conclusion

We were able to perceive welfare status of working equines with a scoring system based on the direct observation method and we met our initial objective from the study. This research might help in finding the various appropriate interventions, boosting strategies, and formulating new plans to aid the welfare status of working equid species. Hence this study reports that working equines working in the brick factories of Lalitpur district and Nirvana Horse Resort were in miserable condition and need immediate care as their welfare indicator fails to meet the standard welfare status. The welfare status of working equids of Nepal Army was found to be fair with various aspects of analysis which concludes these equids are raised with the recommended standard by OIE. This report will be a valuable tool for future assessment and for comparing the welfare strategies and intervention in equine welfare research in Nepal. This study suggests the equine owners and related stakeholders to procure the knowledge of welfare of the equines. This study also suggests the government and the concerned personnels and organization to monitor the status of working animals throughout the country and make necessary provisions of equine health care, provision of education about the equine health standard to the owners in highly densed equine serving areas.

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Conflict of Interest

None.

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