



# A welfare assessment scoring system for working equids—A method for identifying at risk populations and for monitoring progress of welfare enhancement strategies (trialed in Egypt)



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## ABSTRACT

There are an estimated 112 million horses, donkeys and mules (i.e., working equids) in developing regions of the world. Though their roles are often fundamental to the well-being of the families they work for, their welfare is often severely compromised due to the limited resources and/or limited knowledge base of owners. The main objective of this study was to develop a multifactorial welfare assessment score for accurate, comprehensive, quick and reliable assessment of these equids. A total of 5248 working equids ( $n = 2198$  horses, 2640 donkeys, 410 mules) were assessed between February 2012–January 2014. Equids were divided into categories based on the three species involved, as well as the four work types involved (transporting goods or people by cart, ridden (e.g., in tourist locations), or working in brick kilns). Analysis of variance “ANOVA” was used to compare differences between groups with  $\alpha$  set at 0.05. In terms of behavioral measures, the most at-risk equids appeared to be horses who pulled goods by cart with 20.7% showing a depressed attitude and 22.6% being unresponsive to an observer's approach (significantly greater than the other species and the other work types,  $P < 0.05$ ). Mules who pulled goods by cart showed 30.8% avoiding an observer's approach, 42.7% avoiding chin contact and 14.2% showing an aggressive response to observer (significantly greater than the other species and the other work types,  $P < 0.05$ ). In terms of physical measures, 21.6% of donkeys who pulled goods by cart had harness-induced lesions and 21.9% showed evidence of firing-type lesions (significantly greater than the other species and other work types,  $P < 0.05$ ). Mules who pulled goods by cart had the highest prevalence of mistreatment-induced lesions at 36.7% (significantly greater than the other species and other work types,  $P < 0.05$ ). From a positive perspective, horses used for riding or transporting people by cart (e.g., most often animals working in tourist areas) were most likely to be in a healthy physical state (over 85% for both categories; significantly greater than other species and other work types,  $P < 0.05$ ). To conclude, this welfare assessment scoring system met our initial objective of being a useful tool in identifying which equids had the most significant welfare problems (i.e., which species, work type, age and sex). This, in turn will help in selecting appropriate interventions, and in targeting interventions toward the most vulnerable equids.

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## 1. Introduction

According to the World Health Organization (WHO), working animals are defined as those animals that provide an essential resource for their owners who live in poverty (Perry, 2002;

Thornton et al., 2002). Pritchard (2010) concluded that transport animals perform a wide variety of economic, labour reducing and social roles in a broad range of developing environments. After cattle, working equids are considered the main working animals worldwide (Blench and MacDonald, 2006); there are an estimated 112 million working horses, donkeys and mules in the developing world (FAOSTAT, 2011). They make a substantial socioeconomic contribution to their communities according to non-governmental organizations (NGOs), yet there is a scarcity of published scientific evidence (Chang et al., 2010; Velázquez-Beltrán et al., 2011).

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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 (Mekuria et al., 2013). Veterinary care, adequate feed and a good quality harness or even harness adjustments are mainly supplied by NGOs. Fortunately, there are a few UK-based NGOs that specifically address health and welfare issues relating to working equids. In addition, there are some smaller, independently funded organizations that work in Egypt. Usually these organizations provide veterinary care from fixed or mobile clinics. Services include preventive care (e.g., anthelmintic administration), services for acute problems (e.g., wounds and colic), and supportive care for chronic problems such as lameness, as well as improving social awareness about the best management practices for these animals (<http://www.thebrooke.org>, 2013).

Usually NGOs operating in the working equid sector define their own objectives with regard to interventions (Upjohn et al., 2014). In addition, it is imperative that their objectives and activities make a positive difference to the community in which they operate. Thus, an effective monitoring and evaluation (M&E) process is required to ensure that these organizations are able to investigate whether their objectives are being achieved, and also to monitor the efficiency of their activities in improving equid welfare. Such processes should be done on a regular basis, and involve a continuous process of data gathering and analysis (Poate, 1993; Martin, 2001).

Due to the scarcity of NGO resources, M&E is considered essential as it enables the organization to identify and evaluate the most efficient allocation of these resources in addition to following up on the fulfillment of the objectives granted by such resources. Thus, formal application of precise M&E has risen on the NGO development agenda in recent years (Wallace, 2010) and numerous guidelines and general literature on effective M&E activities are publicly available (Wood et al., 1998; Roche, 1999; Davies, 2001). For those concerned about working equid welfare, there is an additional ethical necessity for the assessment of the working equids' welfare status in order to identify the existing welfare problems, as well as risks for other potential problems that may occur. M&E exercises help to identify the optimum solutions that can be applied to welfare problems. Several comprehensive studies on the lives of working equids, and the influence of their lifestyles on their health, behavior and in turn their welfare status have been conducted over the past years (de Aluja, 1998; Pritchard et al., 2005; Swann, 2006; Tadich et al., 2008; Burn et al., 2010b; Popescu and Diugan, 2013).

Working equids are managed differently from most stabled equids (e.g., leisure horses and horses engaged in competitive events) as they are neither kept in fully equipped group housing stables, nor receive the same type of husbandry, nutrition, veterinary care and handling as many of their counterparts. Moreover they are obliged to work long periods, pull or carry heavy loads, and are often exposed to harsh environmental conditions. As such, reliance on resource based or input based methods for evaluating the welfare status of working equids may not be the best methodology (Wood et al., 1998; Bartussek, 1999). Although use of resource based methods is usually objective and repeatable, it mainly indicates the risk of welfare problems, rather than actual and existing ones (Rousing et al., 2001). Moreover, a positive score does not guarantee good welfare status (Winckler and Willen, 2001; Why et al., 2003).

For working equids in developing parts of the world, animal based measurements or direct observations are considered to be more reliable, relevant and suitable for assessing the status of these animals. Resource based measurement is rarely practical in many cases, and there are almost never records kept for animals describing their past treatment, vaccination/deworming history or even disease history.

Direct observation has shown to be highly effective for assessing the immediate welfare status of the working equid; however, one obstacle to this methodology is that the fast working daily rhythm of working equids means that it is necessary to perform the assessment very quickly. Another potential disadvantage may be low intra- and/or inter-observer reliability of the assessments. Few studies have been conducted to examine this obstacle. However, Main et al. (2000) demonstrated that a high level of observer repeatability could be achieved in locomotion score of pigs, and Hansen and Møller (2001) concluded that after 30 min of training, six farmers were able to achieve 74–100% agreement when performing temperament tests on farmed mink.

The main objectives of this study were (1) to build up a multi-factorial welfare assessment system for accurate, comprehensive and reliable welfare assessment of working equids, which NGOs, practitioners, veterinarians and researchers can use to evaluate the welfare status of working equids, and (2) monitor the progress of NGO welfare intervention strategies over time, and identify high need areas for implementation of welfare improvement strategies. It is important that such a welfare scoring protocol can identify which type of equid, in terms of species, age, sex and type of work, has the most at risk welfare status, as well as to identify types of welfare impairment (e.g., behavior, body condition score (BCS), body lesions etc.). This will help the assessor to decide upon necessary interventions. It has been repeatedly shown (Burn et al., 2010b; Popescu and Diugan, 2013) that when a working equid's welfare status is improved, that animal's wellbeing and longevity are typically enhanced. This, subsequently, has an economic benefit to the family it works for, as less money needs to be spent on health interventions, fewer days are lost to the poor health of the equid, and fewer resources go toward animal replacement.

## 2. Methods

All research protocols were approved by the Veterinary Medicine College, Cairo University, Animal Behavior and Welfare Committee prior to the start of data collection.

### 2.1. Welfare assessment scoring system

As a starting point for this study, we used published literature investigating the welfare of working equids. These included the welfare assessment protocol developed by Pritchard et al. (2005), the behavioral welfare indicators described in detail by Burn et al. (2010a) and also modifications made by Popescu and Diugan (2013). The welfare assessment scoring system was refined using the experience in the field of the first and last authors, and consultation with thirteen working equid experts via a written questionnaire.

### 2.2. Working equids welfare assessment

Based on our literature reviews, there are no official data available about the total population of working equids in the visited regions in Egypt. Estimated numbers are based on local knowledge and estimates done by Brooke (<http://www.thebrooke.org>, 2013). Both were used to make the best estimates for the total number for equids working in each region. The aim of our sampling technique was to assess at least 10% of the population among visited sites, while appropriately representing the actual proportion of each species and working equid type within each region. Multiple regions inside the Cairo and Giza governorates that were visited regularly for this purpose include: Nazzlet Elsemman, Abo Seir, Kasr Elnile St. and Elkanater Elkhyria. These were visited to assess riding horses (R) and equids that are used to transport people by carts (TPC). Nahya, Elbragil, Tersa, Rod Elfarag and Mansheyat

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