

indicate lack of awareness of grooming and wound care. Burn et al (2002) have also identified an association between dirty equipment and tail lesions in working donkeys. In both situations it is unclear whether dirty coat condition may be a cause or an effect or both

***Wetness of the padding is associated with increased prevalence of broken skin lesions at wither area***

Padding material consists of 3–4 layers of blankets put over the back of animal before putting on the saddle. The association between padding wetness and increased lesion prevalence could be explained by increased chaffing of the skin in wet conditions. Wetness may be due to rain or sweat or may be a discharge from an existing lesion. Therefore, as with coat condition, there is a possibility that this association is an effect of the lesions rather than a cause or association.

**Conclusion**

Findings were shared with project staff and will be used in the development of awareness-raising materials (posters and preventative messages) for animal owners, farriers and saddlers during treatment camps and awareness-raising sessions. These findings act as guidance for the development of these materials thus improving resource allocation.

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**THE REAL AND RECURRENT COSTS OF DEVELOPING AND SUSTAINING EFFECTIVE HEALTH-CARE DELIVERY SYSTEMS: 'THE ELEPHANT IN THE ROOM'**

**P. Poore**

Evidence for Development, UK

**Introduction**

This is a brief review of my experience of health-care development over the last 37 years in many of the poorest countries of the world.

There are many striking similarities between the problems and the solutions of delivering human and equid health-care [1] services. The common factor is that poor people with many competing priorities for limited resources have few choices when deciding how to use their assets for the benefit of their families. They may have long-held cultural beliefs and attitudes, including harmful practices, and when care is available it is often of poor quality and may even be damaging to health. This paper focuses on the problems of developing and sustaining effective health-care delivery systems, and particularly the real and recurrent costs of ensuring quality that are often forgotten but remain 'the elephant in the room'.

In 1978, the world, through the WHO, UNICEF, and member states, made a first commitment to provide Health for All by the year 2000. The strategy to be used was defined in the Alma Ata Declaration of Primary Health Care. This remains especially relevant today as it considers 'health' (PHC) from the broadest aspect. For example, primary health care (PCH) involves, in addition to the health sector, all related sectors and aspects of national and community development, in particular agriculture, animal husbandry, food, industry, education, housing, public works, communications and other sectors; and demands the coordinated efforts of all those sectors.

The declaration was and is much more than a call to treat and prevent disease. It required a major shift in wealth distribution and in the politics of decision-making. As such, it was a document that challenged many existing political structures and economic interests. Not surprisingly, perhaps, it did not always find the practical and financial support that was crucial for its success in the long term.

Throughout the 1980s, 1990s, and the first decade of 2000, the focus of much of the effort to improve human health has been on the control and even eradication of specific diseases through the delivery of vaccines, bed nets, medicines, including antibiotics, and simple techniques like rehydration therapy. There have been many successes with these strategies, with a reduction worldwide in most of the diseases that commonly kill or disable. On the other hand, significant gains in health were made long before the advent of vaccines and antibiotics, largely attributable to improvements in public health measures including food security, water, sanitation, shelter, and education – the other social determinants of health.

In 2010, although a great deal has been achieved for many, including the eradication and control of some diseases, and a reduction of mortality in children worldwide, especially amongst the better off, 'Health for All' remains a dream. Many are denied access to these benefits. The gap between rich and poor grows. Inequity within and between countries remains and widens. And at the same time new threats are emerging, including a global economic crisis, water and food insecurity, resource conflicts, population movements, climate changes, and potential epidemics.

**Health care systems: the devil is in the detail**

To be able to deliver anything to anyone, anywhere, there has to be a system and this system can be likened to a chain with many links. Like any chain, its strength lies in its weakest link. The concept of health systems has been

around for decades, but governments and donors have only recently taken the problem of sustaining such systems seriously. Even now the reality of the costs, especially the recurrent costs of an effective system, have been either ignored or underestimated. (Estimates in 1993 put the figure at \$12 per capita per year. Today, \$60 has been suggested.) In reality, the figure clearly varies widely depending on context and the quality of the care offered. Of course, it is quite possible to deliver anything to anyone anywhere, if the resources are available. But unless every link in the chain of delivery is secured with skilled staff providing high-quality care to people who recognise the value of that care, it will fail.

Although international health assistance has quadrupled over two decades rising to US\$21.8 billion in 2007 [3] attempts to solve the long-term problem of funding and support, especially of recurrent costs of health delivery systems, have been less successful. In all discussions on 'development' this inability to ensure continuous and adequate support to these systems indefinitely in the poorest countries remains 'the elephant in the room'.

### **Health-care system development: the detail**

#### ***The people***

Any system consists mainly of people, those who are the recipients of care and those who provide it. So a first requirement is to understand what the recipients of care need, what they think they need, what they want, what is already available to them, and how they currently respond to health concerns. Knowing what people do and why they do it is no easy task given the great diversity of human activity and circumstance. And yet, unless this is known by those seeking to help, any intervention will be based on at best incomplete, and at worst inaccurate, knowledge of local reality. The next requirement is for providers, people at every link in the chain, including health workers, drivers, mechanics, etc. They all need to be supplied with the means to do their job, including salaries, and they all need continuous support, including continuous education to ensure that the quality of the care they offer remains effective.

#### ***Quality of care***

Measuring the accuracy of diagnosis and treatment of common conditions by health workers is difficult. The value of any treatment will obviously depend upon the right medicine being prescribed for the right disease. Inaccuracy of either will be ineffective, costly, and possibly dangerous. The cost of ensuring that health workers' training is maintained and reinforced, and that they have continuous support, is not fully known. It is likely to be high. If these costs are not fully met, then this 'link' in the chain will be broken and the quality of the service will suffer.

At the same time, the quality of drugs at many commercial drug stores in less developed countries is inadequate, with up to 40% of drugs in some outlets found to be counterfeit and ineffective. The impact of this can be catastrophic.

#### ***The problem of access and transport***

The decision to go to a health facility will be influenced by many things, including the cost in time and money spent travelling, local social and cultural beliefs, gender, age, the specific disease, the availability of transport, and the perceived value of the service offered at the health centre.

The mobile health clinic has a long history but, in my experience, the requirements for fuel, maintenance, spare parts, driver skills, and salaries are often the cause of its failure.

#### ***The problem of cost, especially recurrent costs***

External donors often provide capital costs and start-up costs. The recurrent costs of salaries, supplies, consumables, continuing education, and fuel are usually provided by national governments; and, for many governments, competing priorities mean that these recurrent costs are not met. The full costs of high-quality care in specific contexts are not known.

#### ***Poverty and health***

Though it is clear that the wealthy are more likely to enjoy higher standards of health than the poor, the relationship between health, poverty, wealth, and inequity still requires much greater definition. Thirty years ago in Sri Lanka, Meegama showed that at village level, under-5 mortality was concentrated in a few households. It is well known that a relative minority suffers the burden of poor health in any community, though the categorisation of that minority remains elusive. The need to understand more fully what happens at a very local level and what choices people have in times of economic stress is the key to developing a much more radical approach to ensuring health for all.

#### ***Data collection and accuracy***

Policy decisions should depend upon reliable and accurate data. However, information is power. Data are often collected, analysed, and manipulated to satisfy governments and donors, as well as non-government organisations, all needing to show that what they are doing really works.

Reality, especially at the household level, is complex. Techniques to measure poverty are flawed. Evidence for Development [4] offers a new approach to understanding poverty at and within the household.

#### **Notes and references**

[1] The Brooke's international strategy: a review and next steps, 2010.

[2] Declaration of Alma-Ata, International Conference on Primary Health Care, Alma-Ata, USSR, 6–12 September 1978.

[3] Ravishankar N, Gubbins P, Cooley RJ, et al. Financing of global health: tracking development assistance for health from 1990 to 2007. *Lancet* 2009, 373: 2113–24. This compares to the \$1.5 trillion spent globally every year on military expenditures.

[4] See [evidencefordevelopment.com](http://evidencefordevelopment.com).

## WORKING EQUINE FEEDING PRACTICES IN UTTAR PRADESH, INDIA: WITH SPECIFIC REFERENCE TO HORSE AND MULE

R. K. Rao, T. Agrawal T, R. K. Ravikumar, and S. R. Gupta

The Brooke Hospital for Animals (India), F-86 Preet Vihar, Delhi 110092, India  
ratnesh@thebrookeindia.org

### Introduction

In India there are around 1.58 million equines contributing to 0.33% of the total livestock population [1]. They are primarily kept in the region of the Himalayan belt and scarcely distributed in other parts of the country. They are fed with crop residues, agro-industrial by-products, and locally available green fodder. Optimizing rations is a huge challenge for equine owners in this low-input system. This study was undertaken to understand the prevailing feeding practices for working equines (horse and mule) and to facilitate 1 group of equine owners developing an improved feed mix.

### Methodology

The study was conducted to ascertain the feeding systems and local feed and fodder used in equine-rearing practices, and their seasonal variation. The study was conducted in some pockets of Delhi and 7 districts of Uttar Pradesh, i.e. Bulandshahr, Bijnore, Ghaziabad, Meerut, Muzaffarnagar, Noida, and Saharanpur (Table 1). A total of 146 respondents with at least 1 equine animal at the time of investigation were selected randomly and interviewed through a structured schedule.

These respondents came from 15 villages of the selected districts of Uttar Pradesh and Union Territory Delhi. They engaged their animals mainly in brick-kiln activities which take place in the winter and summer seasons. In the rainy season, equines are used for transportation of people or agricultural produce.

The interview schedule was pre-tested before use in a non-sample area and interviews were conducted by Veterinary Assistant cum Community Motivators (VACM) trained in collecting information. The information on items such as feed/fodder offered in different seasons was noted on the basis of recall by equine owners. Following this, a case study was undertaken to facilitate the design of a successful location-specific feed mix by equine owners in the Brooke Hospital operational area.

**Table 1. Equine owners selected**

S. no.	District	No. of villages	No. of respondents selected
	Delhi	UT	10
1	Bulandshahr	3	21
2	Bijnore	2	18
3	Ghaziabad	4	36
4	Meerut	2	20
5	Muzaffarnagar	2	20
6	Noida	1	11

7	Saharanpur	1	10
		15 + UT	146

### Results: age and body weight

The average age of horses and mules among the sample population was found to be 7.91 (5.11 $\sigma$ ±0.45SE) and 7.08 years (3.83 $\sigma$ ±0.52SE) respectively. The average body weight of horses among the study population was 231.07kg (57.04 $\sigma$ ±5.76SE); and for mules, 226.25kg (62.90 $\sigma$ ±8.41SE).

### Results: feeding pattern

#### Method of feeding

On average, equine owners provided drinking water 5.01 times (1.53 $\sigma$ ±0.13SE) and fed their animals 3.77 times (1.89 $\sigma$ ±0.15SE) per day. About 50% of equine owners indicated that during each feeding session about 3.72kg (1.72 $\sigma$ ±0.19SE) of feed was offered. Straws/stovers were chaffed to enhance voluntary intake; in a few circumstances the owners soaked them in water. Grains such as chana (gram) were mixed with bran to ensure proper mastication. The owners offered grains either in the feed trough or used separate utensils according to location. The feeding pattern for dry fodder, green fodder, and concentrate is given in Table 2.

#### Grazing pattern

- *Brick-kiln season.* 7.40% of equine owners allowed their animals for at least a 2-hour grazing period and 50% allowed less than 1 hour; the remaining 42% of equine owners did not allow their animals time for grazing.
- *Brick-kiln off-season.* 64.19% of equine owners took their animals for grazing and 35.81% fed their animals in their stalls. About 80 equine owners (54.05%) could specifically indicate grazing periods for their animals with an average grazing duration of 2.84 hours per day (1.32 $\sigma$ ±0.14SE).

**Table 2. Feeding pattern among equines**

S. no.	Season	Dry fodder (kg/day) mean ( $\sigma$ ±SE)	Green fodder (kg/day) mean ( $\sigma$ ±SE)	Concentrate (kg/day) Mean ( $\sigma$ ±SE)
Horse (n=98)				
1	Summer (brick kiln)	3.83 (1.95±0.19) <sup>a</sup>	6.80 (5.93±0.59) <sup>a</sup>	2.50 (1.79±0.18) <sup>a</sup>
2	Rainy (off -season)	2.95 (2.04±0.20) <sup>a,b</sup>	11.48 (9.94 ± 1.00) <sup>a,b</sup>	2.08 (1.87±0.19) <sup>b</sup>
3	Winter (brick kiln)	3.86 (2.19±0.22) <sup>b</sup>	8.51 (7.33±0.74) <sup>b</sup>	3.31 (2.24±0.22) <sup>a,b</sup>
Mule (n=50)				
1	Summer (brick kiln)	5.11 (2.61±0.37) <sup>a,b</sup>	4.51 (3.63±0.51) <sup>a</sup>	2.32 (1.94±0.27) <sup>a</sup>
2	Rainy (off-season)	3.21 (2.40±0.33) <sup>a</sup>	6.05 (5.16±0.73) <sup>a,b</sup>	1.77 (1.66±0.23) <sup>a,b</sup>
3	Winter (brick kiln)	3.48 (2.44±0.35) <sup>b</sup>	4.30 (3.77±0.53) <sup>b</sup>	2.63 (2.00±0.28) <sup>b</sup>

<sup>a,b</sup> Difference between means is more than 2.58SE (2-tailed test) (1% level of significance)



**Dry fodder**

About 95% of equine owners fed mostly straws and stovers like wheat bhoosa for to provide bulk to the feed. There was a significant difference in feeding dry fodder between the brick-kiln season (both summer and winter) and brick-kiln off-season for horses. In the case of mules, the feeding of dry fodder during the summer (brick-kiln season) was significantly higher than in the brick-kiln off-season (rainy) and the winter season (brick-kiln season) (Table 2).

**Green fodder**

Equine owners fed mostly doob/hariyali grass (*Cynodon dactylon*) which is a perennial fodder along with locally available green grass forages, such as oats (*Avena sativa*) and berseem (*Trifolium alexandrinum* L). Doob grass contains 10–12% protein and is an important part of the maintenance ration [2]. It was found that feeding of green fodder during the brick-kiln season (both summer and winter) was found to be significantly lower than in the brick-kiln off-season for both species (Table 2).

**Concentrate**

In the case of horses, it was found that the level of concentrate feeding during the winter brick-kiln season was significantly higher than in the summer brick-kiln season and rainy brick-kiln off-season. However, in the case of mules, feeding of concentrate during brick-kiln season was found to be significantly higher than the brick-kiln off-season (Table 2). Table 3 indicates that nutritive value of rice bran was considered lower than wheat bran due to extraction of vital nutrients and mixing of rice husks [3].

**Feed supplements**

Equine owners described how feeding fresh grass provides adequate energy (28.38%) and protein (27.03%) for their animals. About 67% of equine owners provided salt (30–50g/day) to their animals to enhance digestion and water intake. It was found that 25% of equine owners provided jaggery (gud) to protect animals from tiredness and cold and to aid proper digestion. They fed a maximum 500g/day jaggery during winter and 100–250g during the summer season; and administered 150–200g ghee twice a month during summer as a protein (39.19%) and energy (58.11%) supplement (Table 3). During winter they provided 150–200g mustard oil instead of ghee.

**Table 3. Functions/benefits of feed materials as perceived by equine owners**

S. no.	Feed material	Nutritional characteristics				
		Protein source: frequency (%)	Energy source: frequency (%)	Roughage: frequency (%)	Rich in minerals: frequency (%)	Any other: frequency (%)
Dry fodder						
1	Wheat bhoosa	2 (1.35)	8 (5.41)	141 (95.27)	2 (1.35)	1 (0.68)
Green fodder						
2	Fresh grass (green fodder)	42 (28.38)	40 (27.03)	87 (58.78)	71 (47.97)	4 (2.70)

Concentrate						
3	Kanna or kammu (rice bran)	20 (13.51)	47 (31.76)	80 (54.05)	16 (10.81)	4 (2.70)
4	Gehu/choker (wheat bran)	36 (24.32)	37 (25.00)	97 (65.54)	20 (13.51)	18 (12.16)
5	Chunni (gram husk)	33 (22.30)	35 (23.65)	26 (17.57)	28 (18.92)	0 (0.00)
6	Grain - chana (gram)	114 (77.03)	125 (84.46)	35 (23.65)	83 (56.08)	4 (2.70)
7	Grain - jau (barley)	64 (43.24)	73 (49.32)	20 (13.51)	53 (35.81)	4 (2.70)
8	Grain - jai (oat) 71 (47.97)	71 (47.97)	59 (39.86)	27 (18.24)	34 (22.97)	0 (0.00)
9	Grain - owar (sorghum)	24 (16.22)	25 (16.89)	16 (10.81)	14 (9.46)	4 (2.70)
10	Grain - bajra (pearl millet)	58 (39.19)	73 (49.32)	18 (12.16)	48 (32.43)	3 (2.03)
Feed supplements						
11	Gud (jaggery)	44 (29.73)	89 (60.14)	5 (3.38)	30 (20.27)	37 (25.00)
12	Salt	22 (14.86)	8 (5.41)	1 (0.68)	13 (8.78)	99 (66.89)
13	Ghee	58 (39.19)	86 (58.11)	0 (0.00)	35 (23.65)	13 (8.78)

**Results: use of local knowledge to improve better feeding practices – adaptive research****Farmer involvement in identifying and developing rations**

Equine owners in Bijnore district of Uttar Pradesh, India mostly depended on chana (gram) for animal feed and felt the need to have cost-effective, balanced rations. A village meeting was called on 20 March 2009 where group leaders and Mr Desh Raj Singh, adviser and promoter of community welfare, deliberated along with the Brooke team. A decision was made to prepare a mixed feed of 300kg material at the rate of 4,875 Indian rupees (IR) (Table 4). The cost of such a mixed feed was found to be IR16.25 per kg which was much cheaper than a single ration containing gram at IR28/kg. Mr Desh Raj Singh volunteered to prepare such a feed mix and an advance of IR5,000 was given to him. About 11 owners readily agreed to feed the mix and 25 animals were fed. Based on their experience they also suggested adding 2% salt to the mix.

**Table 4. Feed composition agreed by equine owners**

S. no.	Feed stuff (regional name)	Feed stuff (English name)	Feed stuff (scientific name)	Cost per quintal (IR)	Cost per 75kg feed material (IR)
1	Jau	Barley	Hordeum vulgare	1,300	975
2	Bajra	Pearl millet	Pennisetum americanum (L.) Leek	1,100	825
3	Makka	Maize	Zea mays	1,300	975
4	Chana	Gram	Cicer arietinum	2,800	2,100

The equine owners evaluated the mixed feed based on:

- Enhanced vigour, indicated by speed with which animal returned to work
- Enhanced alertness, indicated by quick response to stimuli
- Enhanced body condition, indicated by glowing skin condition [4].

After 23 days of feeding the modified formulation, a meeting was fixed on 16 April 2009 with the support of the district unit.

#### **Lessons learned through participatory trial**

Equine owners reported that feed intake was reduced and suggested that the salt level might have affected the palatability of ration. They modified the formulation by reducing salt level to 1%. They also felt that bajra, which generates heat, needed to be replaced with wheat bran during the summer season. The mix was adapted accordingly, and in the next 4 days all 11 equine owners found their animals exhibiting a proper appetite because of the enhanced palatability of the feed.

#### **Demand for their technology**

The demand for the feed mix grew owing to the positive impact on the animals and its low cost. A total of 29 equine owners from 6 villages, i.e. Gilada, Chitavar, Gopalpur, Goyali, Kakrala, and Rawati, started to adopt the mix for their 33 equines (horse). During the adoption period of 87 days (16 April 2009–15 July 2009) the district unit veterinarian closely monitored the animals' well-being. The duration of the trial followed previous research [5] which lasted 84 days. Parameters such as colic, diarrhoea, loss of appetite, and fever were evaluated, and the animals found healthy.

#### **Conclusions**

The study found that there was significant variation in feeding practices between the brick-kiln season (summer/winter) and brick-kiln off-season (rainy). It was also found that feeding practices did not depend on season, but were based on the type of work the animals were involved in. Equine owners in the study area did not feed oil cakes to their animals.

The work conducted with the equine owners themselves showed that a feed mix derived from locally available material had a profound positive impact over animal physiology. The equine owners had promptly capitalized on their knowledge regarding the effect of such feedstuffs which they could quantify through key indicators. This enabled them to minimize the undue effect on palatability and to develop a mix for suitable for the season. Promoting collective purchase, identifying good-quality feed, cultivation of fodder near brick-kiln fields, improved storage site, and exploring unconventional feed stuffs may mitigate feeding problems. The study recommends that adequate attention be paid to species difference while strengthening local feeding systems.

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## **COMMUNITY-BASED HARNESS DEVELOPMENT INITIATIVE FOR PACK DONKEYS: A PROGRESS REPORT, ETHIOPIA**

**M. Tesfaye<sup>1</sup>, E. Bojia<sup>1</sup>, G. Feseha<sup>1</sup>, G. Ayele<sup>1</sup>, F. Alemayehu<sup>1</sup>, G. Lemessa<sup>1</sup>, E. Manhalishal<sup>1</sup>,  
F. Seyium<sup>1</sup>, B. Amare<sup>1</sup>, N. Dereje<sup>1</sup>, C. Chala<sup>1</sup>, A. Abebe<sup>1</sup>, W. Chala<sup>1</sup>, A. Gete<sup>1</sup>, G. Chris<sup>2</sup>,  
J. Anzuino<sup>2</sup>, N. Robert<sup>2</sup>, and M. Getachew<sup>1</sup>**

<sup>1</sup>Donkey Health and Welfare Project (DHWP), Faculty of Veterinary Medicine, Addis Ababa University, PO Box 34, Ethiopia

<sup>2</sup>The Donkey Sanctuary, Sidmouth EX10 0NU, UK  
tmegra@yahoo.co.uk

#### **Introduction**

Donkeys have long been intimately associated with humans as beast of burden [1]. Harness technology has been developed both traditionally by owners as well as by researchers. However, there have been few initiatives to combine traditional and modern technologies on the ground with communities using donkeys [2].

The Donkey Sanctuary's (DS) Ethiopia project launched a harness development initiative as an integrated part of its donkey health and welfare programme in 2003 with the main objective of preventing harness sores, i.e. back, girth, chest, and tail sores, in pack donkeys. These sores are associated with the use of unpadded packsaddles, ill-fitting harness, synthetic fertilizer sacks with inadequate padding, or girth straps made of worn-out tyres.

The prevalence of the sores in the project areas was 33.7% in 1991 [3]; it has decreased in subsequent years to 22.6% (2001), 16.4% (2002), 16.9% (2003), 17.9% (2004), 18.2% (2005), 18.0% (2006), 16.3% (2007), 15% (2008), and 14.6% (2009). Besides the prevailing poor harnessing practices, the undulating rough terrain of the Ethiopian landscape contributes to the high prevalence of harness sores. Donkeys are the backbone of transport for the rural community which makes up 85% of the nation. They are used for transporting farm produce from farms to home, market, and grinding mills houses; and transporting firewood, charcoal, animal dung, and constructions materials including wood, stone, gravel, cement blocks, bricks, and sand.

Treating harness sores, where resting is unlikely, is a futile cycle of activities and a waste of resources. Therefore, the Donkey Sanctuary took the initiative to put more effort in preventing harness wounds by working with the communities at ground level. This paper describes the progress made to date.

#### **Locations and materials**

Hot spot areas of Ada, Akaki, Lume, Boset, and Sebeta districts of central Ethiopia, within the DS operating area, were identified.

Materials used include jutes sacks, fertilizer sacks, sisals threads for making straps and suturing, needles, straw (preferably wheat), as well as worn-out clothes, blankets, and wooden stick. All materials in contact with the donkey are natural.

#### **Protocol**

Three approaches were adopted.

#### **Developing a practical packsaddle prototype with the community**

At this stage, harness-development practitioners from the DS-UK, local experts from the DHWP, and community representatives from respective districts were involved in developing and testing a practical, affordable, and accessible prototype.



**Production and distribution stage**

Hundreds of packsaddles were produced by the project harness makers in the DHWP ground and were distributed strategically to identified project sites to create demand in the community.

**Transfer of the packsaddle-making technology to the community**

- *Onsite packsaddle production with owners.* This segment of skill transfer to the community is integrated with the routine primary health-care activities of the project. Project harness makers accompany the mobile team and work with (supervise) owners in the village to make packsaddles; the owners bring raw materials like straw, worn-out jute sacks or fertilizer sacks while the harness makers supply needles and sisal thread. In a few instances the owners may not have all the required materials. The project is then expected to supplement more items.
- *Onsite training of local harness makers.* The other arm of transferring the technology is through organized groups of individuals who are willing to train to earn an income by making and selling packsaddles to local users. In the Ada district 5 open-market sites of Bekejo, Dirre, Hiddy, Yerer, and Godino were selected because of high back sore prevalence. A sixth site, Daka Bora, was in the Lume district. Open-markets were selected because these are places where donkey owners from different parts of the district meet to buy and sell various commodities including agricultural produce. Five individuals from each site were selected through local state agricultural development agents (DAs), depending on their interest in running the business and allowing access for supervision by the project. A practical 2-day training workshop, using donkeys, was held at each site before each group started production. The trainees in Godino were individuals pre-organized by a micro-credit association for self-help, while in Dirre they were a women's group organized by local DAs to participate in any job opportunities. In Bekejo they were individuals from the community who showed in training as local harness makers. Most of the trainees had experience in making mattresses of fertilizer sacks and wheat straw, which made the training quite easy. Each site was monitored and evaluated by the mobile team while they were dealing with their daily clinical activities. In the beginning, material supply was fully subsidized, later half-subsidized, and now a revolving fund scheme is under development to ensure sustainability.

The objective of the project is to empower the donkey owners with skills to produce appropriate packsaddle by themselves from natural materials available locally, thus improving donkey welfare.

**Results**

**Developing a practical packsaddle prototype**

**Figure 1. Measurements of the upper side of the packsaddle prototype developed; the upper side is a fertilizer sack, which is waterproof and hence durable**



1. Length 90cm
2. Width 70cm
3. Width of band 12cm
4. Space between bands 5cm
5. Width of saddle over ribs 25cm
6. Width of strap 5cm
7. Length between stitches 8cm
8. Dimension of band 18cm
9. Length of straps in contact with the donkey 76cm
10. Length of strap for knotting the strap 78cm

**Figure 2. Side of packsaddle contacting the donkey, which should be made of a natural material such as a jute sack**



Pilot testing of the prototype (Figures 1 and 2) with more donkey users revealed a huge acceptance among rural communities utilizing donkeys for fetching water, transportation of firewood, charcoal, and construction materials, etc. However, the urban communities whose livelihood depends on donkey power, including donkeys in the metropolis, modified the prototype to a smaller and uniform width with no bands.

**Production and distribution of packsaddles**

Since the start in 2008, 520 packsaddles were made by the project and distributed in 32 project operation sites within 5 districts (Table 1), creating a real demand.

**Table 1. Intervention sites, major tasks of donkeys, and number of packsaddles distributed**

District	Major uses	No. of sites	Packsaddles distributed
Ada	Transporting water, charcoal, firewood, farm produce	15	260
Akaki	Transporting water, construction materials, farm produce	6	80
Lume	Transporting water, charcoal, firewood, farm produce	2	20
Boset	Transporting water, charcoal, firewood	8	140
Sebeta	Transporting water, construction materials, farm produce	1	20
Total		32	520

The packsaddle provided successfully limited the incidence of harness sores in the population of donkeys provided with the packsaddle. Figures 3–6 depict the packsaddle development endeavour.

Figure 3. Traditional harnessing practice before intervention



Figure 4. Harness production at the Donkey Health and Welfare Project ground



Figure 5. Distribution to randomly selected villages



Figure 6. Packsaddle being used with saddle frame



**Transferring skills to the community: onsite packsaddle production with owners**

Donkey owners/users, women, children (in school and out of school), and, at times, local agricultural development experts came to the mobile units with their donkeys. The numbers of packsaddles produced and communities benefiting are shown in Tables 2 and 3. Owners demonstrated a keen interest while making packsaddles. There was positive competition and also sharing of experience and raw materials (Figures 7 and 8).

Figure 7. Holding discussions with owners about the use of packsaddles



Figure 8. Owners make packsaddles



Table 2. Number of packsaddles made by owners in the respective intervention sites in a day

Districts	Name of trial sites	Number of packsaddles made
Ada	Dire Areriti	12
	Dukem Koticha	8
	Dhibayu	5
Akaki	Wedeso Werebo	9
	Dewara Tin	a
	Insilale Finchewa	5
Lume	Tede Mariam	7
Sebeta	Awash Melka	7
	<b>Total</b>	<b>59</b>



**Table 3. Number of districts and communities benefiting**

Nature and extent of community participation				
District	Focused group discussion	No. initiated saddle making	No. completed saddle making	Total
Ada	1,490	201	32	1,723
Akaki	749	87	18	854
Lume	129	54	5	188
Boset	503	36	8	547
Adulala	626	15	3	644
Alelitu	422	12	2	436
Debre Zeit clinic	1,019	105	27	1,151
Total	4,938	510	95	5,543

Among other things the group discussion enabled us to address the problems of overloading, lack of rest, and load imbalance and also gave us the opportunity to raise awareness about better management of donkeys including how much to load, appropriate loading practice, and harnessing. The benefits of sound management were also mentioned, including a better working life and increased productivity.

**Transferring skills to the community: organized groups of individuals making packsaddles for income generation**

Such groups were organized and trained (Figure 9) at 6 separate sites. They were able to make 400 pack saddles from the materials provided (Table 4) and sold them at subsidized prices.

**Figure 9. Training for packsaddle making for organized groups**



**Table 4. Materials provided for organized groups to start the packsaddle-making business**

Sites of organized groups	Quantity and items provided at each site				
	Jute	Fertilizer sack	Thread	Needle	Readymade packsaddles
Godino	100	200	3	8	20
Bekejo	120	240	8	7	20
Daka Bora	20	40	1	3	20
Hiddy	60	120	2	5	25
Yerer	20	40	1	6	20
Dire	80	160	2	7	20
Total	400	800	17	36	125

**Discussion and the way forward**

Experiences of the DS over the last decade while working with donkey-utilizing communities has demonstrated that one of the major health and welfare constraints is harness-related injuries attributed to prevailing knowledge, attitudes, beliefs, and practices of the local communities [4]. These practices, in turn, have been associated with poor image of the donkey, poverty, and lack of awareness, professional advice, and training. The community harness-development initiative has shown encouraging results. One of the challenges in making packsaddles directly with the beneficiaries was the need for the owners to supply the raw materials. As the skill remains with the owner, he/she can make packsaddles for the rest of his/her donkeys as needed. One problem with the other scheme, i.e. working through a local harness-making group, in the early stages of production, was their need for publicity to sell the saddles. Later they got publicity with the help of the charity and benefited from this. However, recently, because the charity was at the same time empowering donkey owners to make their own packsaddles, the number of clients buying the saddles decreased.

The reduction in incidences of harness sores in donkeys following the introduction of this packsaddle confirms the idea that prevention is better than cure. The DHWP is encouraged to introduce such a programme in other harness sore hot spot areas. Managing wounds, particularly those caused by ill-fitting, inadequate padding or use of synthetic straps, is difficult. The poor owner, whose livelihood entirely depends on donkey power, cannot afford to rest the donkey, and tends to continue using the same material.

At this stage, although the skill transfer scheme is successful, the programme is subsidized partly by the charity. The progress report indicates that both direct and indirect skill transfer schemes are working reasonably. Therefore, it is advisable to continue to reach more owners to change the existing traditional pack donkey harnessing practices. The charity is also focusing on strengthening the system in all operation areas. Community mobilization to change existing practices is not easy; it takes time and resources but once achieved it is the sustainable way of solving problems.



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## EXPERIENCES WITH COMMUNITY ANIMAL HEALTH WORKERS AND GOVERNMENT VETERINARY SERVICES IN ETHIOPIA: SYSTEMS, SUCCESSES, AND CHALLENGES

A. Hailemariam and S. Bishop

The Brooke Hospital for Animals, PO Box 1554 code 1250, Addis Ababa, Ethiopia  
AHM@thebrookeethiopia.org

**Abstract**

*This paper documents the lessons, successes, and challenges gained during an 18-month pilot intervention by the Brooke Hospital for Animals in Ethiopia, through its work supporting government veterinary services and community animal health workers (CAHWs) in the provision of equine health services. Targeted CAHWs have increased their monthly case load from around 5 to 64 equines per month since they received equine training. Changes in government case figures are inconsistent though individual clinics are recording high numbers, but gains are being made in other areas, such as influencing equine specific drug and equipment purchases. The Brooke sees both government and CAHWs as key partners in the development of health services for equines. During 2010, the Brooke is focusing on measuring the impact of equine service provision with owners and through case records.*

**Introduction**

The Brooke Ethiopia Programme started a pilot programme in the Southern Nations and Nationalities Peoples Region of Ethiopia in 2008 aiming to improve the welfare conditions of equines through management practices, and supporting the development of sustainable equine health services through the government veterinary department and community animal health workers. This paper focuses only on the health service delivery element of the programme.

The design of the intervention took into account gaps observed in animal health services, where equines are not being catered for, either by veterinary teaching institutions, by government livestock and animal health departments, or by private veterinary practitioners. Government veterinary services focus on livestock, and provide only limited equine services through vaccination against anthrax and African horse sickness, usually in response to pressure from communities during outbreaks, rather than through appropriate seasonal vaccination.

Community animal health workers (CAHWs) have been part of the government certified national animal health service delivery system since 2004, and in 2009 a national CAHW training manual [1], training of CAHW trainers' manual [2], and minimum standards and guidelines for CAHW services [3] were produced by the Ministry of Agriculture and Rural Development. CAHWs have been trained by government and non-governmental organisations in many parts of the country, principally to provide primary animal health services in rural areas where there are no private practitioners, and government coverage is limited [4]. However, no CAHWs have been trained to deal with equines. In one woreda (government geographic zone) of the Brooke pilot area, an international NGO had trained 12 CAHWs in 2008 and although the organisation had since withdrawn, these CAHWs continued to provide private services to their communities. However, they had not been trained to treat equines. Due to the lack of equine services, many owners had come to believe that there was little that could be done for sick equines, other than using traditional healers, and consequently the CAHWs were treating on average 3–5 equines per month, frequently with inappropriate drugs.

Since the start of the programme in November 2008, 46 government veterinary staff from 27 urban and rural clinics, and 12 community animal health workers have been given equine-specific training by the Brooke to enable them to provide basic equine health services. Training focused on local diseases and those considered as priorities by owners, in order to make the services appropriate for their needs, and as a means to encourage

service use. Following training the veterinary clinics and the CAHWs were provided with basic equipment, and the CAHWs received a one-off supply of drugs. The CAHWs were introduced to local private pharmacies from whom they could purchase drugs and equipment. Government veterinary staff and CAHWs were supported by weekly visits from the Brooke staff. All trainees were encouraged to maintain case records as a means by which cases could be followed up, and for recording drugs use, outcomes of treatments, and fees paid or owing.

#### Results of the support to CAHWs and government veterinary staff

Since receiving training, a CAHW average monthly case load has increased from 5 to 64 equines, alongside other animals they are treating. The increasing numbers of owners bringing their equines for treatments indicates that there is growing confidence in the CAHWs' ability to provide quality services that are also affordable, available, and accessible. The majority of cases treated are wounds, eye problems, respiratory conditions, and internal parasites. CAHWs are provided with a certificate endorsed by the government, which gives owners confidence in their ability and authorisation to deliver services. CAHWs are replenishing their kit with drugs and equipment, all of which are available from local private suppliers.

As CAHWs are mobile service providers, the services are easily accessible to owners in their area. This is a distinct advantage over the government clinics and health posts which provide fixed-point services. Payment for services is good for most of the year, with owners paying within 1 week to 1 month following treatment. However, during the rainy season cash can be in limited supply, and up to 75% of owners get services on credit, repaying their dues after the harvest. This can be a challenging time for CAHWs so they are considering options to address this problem, such as bulk purchase of drugs to reduce costs, and negotiating better rates and credit with the pharmacies.

The average CAHW profit per month is currently 300–500 Ethiopian Birr with seasonal variation (about US\$23–38).

Monitoring has shown that the quality and availability of service from government clinics is variable and partly dependent on the motivation of individual staff. Budgets allocated for drugs and equipment are small but the woreda is able to request specific drugs, and some clinics are now including equine-appropriate drugs on their lists. These clinics are seen to have better equine supplies than others, which is reflected in their case numbers. Lack of appropriate drugs is a factor in the communities' preference for CAHW services, whose kits are usually well stocked with good-quality drugs. For example, in one 3-month period, government veterinary clinics in 1 woreda treated around 7 equines per month per staff, compared with 64 cases per CAHW. In another area, government staff treated 3,296 cases in 3 months, which was mainly due to their high level of commitment.

However, the number of animals treated does not demonstrate improvements in health, nor show impact of the services. In order to look at these factors, during 2009, the Brooke worked closely with local communities to establish the priority diseases affecting equines. This information was triangulated with information from the Brooke and government veterinary staff to ensure that key diseases and conditions were covered.

A participatory impact assessment of the status of equine health in May 2010, which compared the target area with a neighbouring area without CAHW services, has shown significant reductions in the 5 key conditions in the intervention area, with no significant change in the control area. The analysis was done through statistical comparison of scoring results by owners on disease prevalence and mortality rates. CAHW case records showing outcomes of treatments were used as animal-based indicators to cross-check owners' views. The conditions are anthrax, wounds, respiratory disease, colic, and epizootic lymphangitis. African horse sickness, previously considered a major threat, is no longer seen by owners as a top priority due to the success of the seasonal vaccination delivered by government together with CAHWs since the Brooke support started. Analysis of owners' preferences for service providers showed a significant preference for CAHWs over government, private, and traditional providers for quality, affordability, availability, and accessibility.

#### Conclusion

The CAHWs are proving to be the preferred service providers for the rural communities with which the Brooke is working in Ethiopia. Participatory impact assessment conducted by an external consultant provided significant evidence in support of this, as well as demonstrating improvement in equine health status in the area. From June 2010 the Brooke will reduce its weekly monitoring to monthly visits as the CAHWs are now able to work independently with minimal support.

Government veterinary services will always be more limited in their ability to deliver services because of their fixed-point delivery system. Adopting new practices is challenging for government staff due to financial and human resources constraints. However, the government veterinary department has a crucial role to play in the provision of animal health services and the Brooke's long-term goal in Ethiopia is for equine health services to become a standard part of animal health service provision. Whilst CAHWs are able to deal with the majority of cases, they do require veterinary supervision and access to a referral system. The veterinary department should fill these roles, as well as having responsibility for seasonal vaccination campaigns, disease outbreaks, and emergency response. Through the interest of individuals within government, small changes are being noted such as the provision of 72 equine hoof kits to clinics with Brooke-trained government veterinary staff. The Brooke will continue to develop closer links with the veterinary department to discuss equine health service delivery within the broader framework of animal health service strategies, aiming to identify ways of influencing budgetary allocations to ensure that equine-specific drugs and equipment become standard kit for the clinics and health posts.

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## RESOLVING CONFLICTS BETWEEN ANIMAL OWNERS AND SERVICE PROVIDERS: A MEANINGFUL INTERVENTION TOWARDS IMPROVEMENT IN WELFARE

V. Singh<sup>1</sup>, S. K. Pradhan<sup>2</sup>

<sup>1</sup> Arthik Vikas Evam Jan Kalyan Sansthan, U.P., 301 Prime Plaza, Munshi Puliya, Indira Nagar, Lucknow, Uttar Pradesh, India

<sup>2</sup> The Brooke India, F-86 Preet Vihar, New Delhi, India  
vineet\_bbk@yahoo.com

### Introduction

There are about 9,500 working horses, mules, and donkeys at Lucknow district in Uttar Pradesh, India during the brick-kiln season (October to June) and 7,500 during the non-brick-kiln season (July to September) because of seasonal immigration. These animals mostly pull carts to transport passengers and goods, work in brick kilns and carry loads. The welfare conditions of these animals are very poor and their working and climatic conditions are extreme as well. Service providers such as farriers, hair clippers, saddlers and cart makers play an important role in the welfare of these animals. There is a shortage of such service providers especially in rural areas and brick kilns.

Arthik Vikas Evam Jan Kalyan Sansthan, Lucknow is a non-government organization working in social and agriculture development in the district for the last decade. Since 2007 it has worked in partnership with the Brooke India – an affiliate of the Brooke UK, an animal welfare charity dedicated to improving the welfare of working equines in the poorest parts of the world – on a project involving Lucknow brick kilns: out of 141 brick kilns in Lucknow, 87 are currently covered by the project activities.

Brick kilns create high welfare risks for equines for many reasons, including adverse working conditions, high work load, an extreme climate situation during summer, limited facilities in respect of shade/shelter, and poor feed and fodder. The animals' high work load is mostly a result of the heavy burden of perpetual loans availed by animal owners from the brick-kiln owners.

Among all other service providers, farriers are found to be important. High-quality, affordable services are needed at the right time, in or near where the animals work so that they do not have to travel long distances in challenging conditions. Farriery is required at frequent intervals and most often is needed urgently: working animals must be properly shod, since incidences of foot-related problems including lameness are found to be higher in working animals in brick kilns. The major foot problems observed at the brick kilns were thrush, canker, corn, bruised sole, club foot, quittor, hoof shape deformity, laminitis, and foot abscess. The prevalence of foot disease and poor foot management was found to be associated with almost 80% of the animals.

The team used participatory tools and techniques such as resource mapping, service provider mapping, and cost-benefit analysis with the animal owners, service providers, animal contractors, and brick-kiln owners to assess the situation with regard to farriery services. There were 3 main perspectives:

- Equine owners found that farriery services were an increasingly costly affair, and not available in time at their brick kilns. They believed that most farriers were insensitive to the needs of animals and they hurried their work in order to earn more money. But they did not have alternative options because of the limited number of farriers in the locality.
- On the other hand, the farriers believed that the animal owners did not want to spend much time on farriery and asked them to complete the work quickly. Similarly, they thought improvements such as better quality shoe, proper hoof trimming, and appropriate size of shoe increased the cost of farriery further, which equine owners were not ready to pay.
- Our team members understood that the animal owners operated within constraints and needs, and that the

farriers did not perceive that improvement in the quality of their services would increase their business.

We arranged training sessions for both farriers and equine owners but often they did not bring the desired improvements for the following reasons:

- Conflicts of interests between the two parties had to be sorted out first.
- Farriers were not open to such training inputs because they thought they knew better and did not think they were stakeholders in the welfare of equines.

### Method: a case study of brick kilns

Out of 87 brick kilns covered by the project, cart horses and mules are used in 30. In almost all of these brick kilns, lameness appeared as the major issue during situation analysis. Root cause analysis conducted with the animal owners using participatory exercises (problem tree, cause-effect diagram) revealed that improper farriery was one of the main causes of lameness. The causes of improper farriery resulted from the monopoly of farriers in the area because of a very high demand during the brick kiln season. These farriers did not pay adequate attention to the individual requirements of the equines regarding different shoe size, hoof condition and trimming, nails and other factors, because of limitations on time and costs. Although the equine owners were highly dissatisfied with the farriers, there were no alternatives.

### Box 1. Brick-kiln owner's contribution

Awaz brick kiln is situated at Barauna village, 25 km from the city. This season 13 equine owners have come here from Aligarh, about 400km away. These equine owners had to go to see a farrier called Chander at Gosaiganj, 15 km from the brick kiln, for farriery services three times a month. Every time the entire day was spent by an equine owner just to get his animal shod.

During a joint meeting with equine owners, and in the presence of brick-kiln owner Arvind Kumar Gupta, farrier Shahid expressed his willingness to extend his services to Awaz brick kiln. Mr Gupta was quick to realize that if good farriery services are delivered at the brick kiln itself, then he would avoid loss of those 39 working days per month which are spent by the animal owners in accessing farriery. He promptly offered to pay the additional farriery charges of IR 20 (Farrier Chander at Gosaiganj was charging IR 60, while Shahid was asking for IR 80) for this arrangement.

Now all the 3 parties – equine owners, farrier, and brick-kiln owner – are happy with the arrangement and equines have their travel cut by 90 km per month, in addition to getting timely and good-quality farriery, thereby achieving better welfare.

Our team approached 2 farriers in the area, Shahid and Ali Hasan, who claimed to have good farriery skills. We arranged joint meetings with equine owners at the brick kilns. Both parties discussed the issue facilitated by the team members. The equine owners listed their requirements and the farriers explained what good-quality farriery involves. The equine owners' concerns were mainly about hoof trimming, appropriate shoe size, thickness of shoe, and the number of nails being used to support shoes. Apart from agreeing to meet these concerns, the farriers added technical inputs related to hoof trimming and shaping, health and safety measures for equines, owners, and the farriers, and comfort of equines during conduct of farriery work.

This discussion was followed by a 'transect walk' (a participatory method to examine each animal together in a

group) to assess the individual requirements of each animal, such as hoof shape and trimming, sole shape, thickness, size, and type of shoe required, etc. This exercise led to a mutual agreement between equine owners and farriers, which included cost, quality, day and time of farriery, and individual needs of the equines. The cost in all cases was 10–20 Indian rupees (IR) higher than the sum the equine owners had previously paid.

Such meetings resulted in a mutual understanding on good-quality farriery and doorstep service delivery for equine owners. Farriers realized that this was a good business opportunity for them and through quality service they could increase demand for their services. Equine owners also realized that by spending 10–20 rupees more they could get better services right at their door.

#### Results and discussion

Analysis of the impact of such resolutions was carried out by recording the perceptions of all the stakeholders. The process was beneficial for every one, as summarized below.

Better hoof management and care of animals was achieved because of better quality services provided by the farriers. They paid adequate attention to the individual requirements of the equines, relating to shoe size, hoof condition and trimming and numbers of nails, because they had time to do so. Their services were provided in a place convenient to the animals, in a shed right where they stayed, which removed the need to travel long distances (about 30–90km per month), resulting in savings of about IR1,200 per month. Such an arrangement brought a significant reduction in hoof and lameness cases as monitored by the animal owners and the team members using 'participatory welfare needs assessments' [1]. Upon analysis, it was found that foot disease and foot management problems associated with lameness in animals had reduced drastically, from 80% to 30%. There was a reasonable decrease in expenses against costs of farriery by way of reducing farriery visits to twice instead of three times a month and meeting all requirements of quality farriery thereby addressing the welfare of the animals.

Joint meetings provided a platform for negotiations and sharing of experiences about quality aspects, besides giving the farriers an opportunity to increase their business without compromising the welfare of animals. The income of the farriers has increased to a significant level, about IR1,600 per month, because of the increase in number of clients: on average, a farrier visits the brick kilns at least 5 days in a month (his off days from his regular work), shoeing 8 equines on average per visit.

This has ensured availability, affordability, accessibility, and acceptability as well as quality of services to the animal owners. It has also led to a reduction in the loss of work amounting to 15,000 bricks per month per animal for the brick kiln owner, which has resulted in him providing more amenities to the animals and their owners as well. There was an overall increase in sensitivity of animal owners, farriers, and brick-kiln owners in respect of the welfare of the animals which contributed towards incremental improvements [2] in welfare too. See Box 1.

This arrangement has been in place for the past 2 years and is spreading to new brick kilns every new season. A few other farriers, who were not part of the original arrangement, are also now willing to provide services at brick kilns and some have started visiting 1 or 2 brick kilns (where equine owners are known to them) on their own.

#### Conclusion

This experience has overcome 2 misconceptions of the team members: (1) that training is the only possible intervention to address service-related issues; and (2) that equine owners could not afford the increased costs of improved farriery services.

We learned that equine owners are willing to pay more for good-quality farriery which benefits their equines. So 'conflict resolution' is one of the most important interventions to improve the welfare condition of equines and we should not rely only on skill training [3].

#### Acknowledgment

Contributions of the equine-owning communities, farriers, and all team members of AVJKS are gratefully acknowledged.

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## IN VIVO EXAMINATION OF INTESTINAL PARASITES OF WORKING EQUIDS IN UKRAINE AND MODERN PROGRAMMES OF HORSE PARASITE CONTROL

K. Tetiana and K. Vitalii

Institute of Zoology NAS of Ukraine, Bogdan Khmel'nitsky Street, 15, Kyiv, 01601, Ukraine  
taniak@izan.kiev.ua

Gastrointestinal parasites, especially strongylids, infect equids worldwide and can cause severe problems to their health [1, 2, 3]. In Ukraine, the population of domestic horses (*Equus caballus*) consists of more than 700,000. Only 15% of them are brood horses; all other horses are working horses kept at small individual private farms. Additionally, donkeys (*Equus asinus*) are used as beasts of burden at small farms in the southern part of Ukraine.

At the end of 80<sup>th</sup> years of 20<sup>th</sup> century the Agricultural Ministry of Ukraine elaborated its recommendations for horse parasite control at various types of horse farms in Ukraine [4]. However, according to our observations, parasitological examinations and planned deworming of working equids are not performed on individual farms in Ukraine.

The aims of our study were the *in vivo* examination of gastro-intestinal parasite infection of working horses and donkeys on private farms, and the elaboration of a modern programme of parasite control in working equids for small individual farms in Ukraine.

### Material and methods

Our study of intestinal parasites was carried out on 25 working horses from individual farms in the Kyiv region (17 horses), Chernigiv region (2 horses), and Poltava region (6 horses), and on 6 working donkeys from the Crimea. All animals examined were used as beasts of burden on private farms and had never been dewormed with anthelmintics.

Faecal egg counts were carried out using the McMaster technique with a sensitivity of 25 eggs per gram (EPG) [5]. Gastrointestinal parasites were collected from all equids examined by the *in vivo* method of diagnostic deworming [6]. All animals were treated with the macrocyclic lactone drug 'Univerm' (0.2% aversectin, Russia). Faecal samples (200g each) were collected 24, 36, 48, and 60 hours after treatment; all nematodes expelled (9,886 specimens) were collected, fixed in 70% ethanol, and identified under light microscope by morphological criteria [1, 7].

Comparison of the results obtained by the *in vivo* method with our previous data of *post-mortem* examination of 4 working horses from the Kyiv (1 horse), Chernigiv (2), and Poltava (1) regions was performed.

### Results

All working horses examined were infected with intestinal nematodes from the family Strongylidae (prevalence=100%) and *Parascaris equorum* (prevalence=44%). Levels of horse infection by strongylids were low (less than 100 EPG) and medium (100–400 EPG); level of horse infection by *P. equorum* was low (25–100 EPG). Single eggs of *Strongyloides westeri* were found in 2 horse yearlings (prevalence=8%). Eggs of *Anoplocephala perfoliata* were found in 3 working horses (prevalence=12%). As all horses had 'pre-clinical' levels of infection by intestinal helminths, no evident clinical signs of helminthoses were observed during our study.

Strongylid nematodes dominated in the community of intestinal parasites of working horses from 3 regions of Ukraine. In total, 24 strongylid species were found: 6 species of the subfamily Strongylinae and 20 species of the

subfamily Cyathostominae (Table 1). There were 5–18 strongylid species of parasite per horse (average=11.8±3.8). Seven cyathostome species (*Cylyocyclus nassatus*, *C. ashworthi*, *C. leptostomus*, *Cyathostomum catinatum*, *Cylicostephanus longibursatus*, *C. calicatus*, and *C. minutus*) dominated in the strongylid community; they were found in more than 80% of horses examined and together composed more than 87.2% of total strongylid number.

Table 1. Nematodes from the family Strongylidae Baird, 1856, found in working equines in Ukraine

Strongylid species	Horses		Donkeys	
	Prevalence, %	Rate*, %	Prevalence, %	Rate*, %
<b>Subfamily Strongylinae</b>				
<i>Strongylus vulgaris</i>	48.0	0.31	16.7	0.30
<i>S. equinus</i>	28.0	0.14	—	—
<i>S. edentatus</i>	24.0	0.15	—	—
<i>Triodontophorus serratus</i>	24.0	0.20	33.3	1.06
<i>T. brevicauda</i>	16.0	0.24	—	—
<i>T. nipponicus</i>	4.0	0.01	—	—
<b>Subfamily Cyathostominae</b>				
<i>Cyathostomum catinatum</i>	96.0	13.95	66.9	10.59
<i>C. tetracanthum</i>	—	—	100	55.22
<i>C. pateratum</i>	28.0	2.07	61.2	2.27
<i>Coronocyclus coronatus</i>	64.0	1.87	9.6	0.76
<i>C. labiatus</i>	60.0	2.51	5.7	0.30
<i>C. labratus</i>	56.0	1.52	2.1	0.15
<i>Cylicostephanus calicatus</i>	80.0	5.81	5.7	0.30
<i>C. minutus</i>	84.0	5.70	3.8	0.15
<i>C. hybridus</i>	8.0	0.16	—	—

<i>C. longibursatus</i>	92.0	17.27	21.2	7.41
<i>C. goldi</i>	76.0	1.42	55.4	6.51
<i>Cylicocycclus nassatus</i>	100.0	27.59	88.5	13.46
<i>C. insigne</i>	52.0	0.70	5.7	0.30
<i>C. elongatus</i>	20.0	0.33	2.1	0.15
<i>C. leptostomus</i>	88.0	12.04	33.8	1.30
<i>C. ashworthi</i>	92.0	4.86	—	—
<i>C. auriculatus</i>	—	—	11.6	0.76
<i>Poteriostomum imparidentatum</i>	8.0	0.02	—	—
<i>Petrovinema poculatum</i>	36.0	1.09	—	—
<i>Gyalocephalus capitatus</i>	4.0	0.01	—	—

Rate\*, %=proportion of the separate species in the strongylid community

All working donkeys were infected by intestinal strongylids (prevalence=100%); the level of infection was rather low: from 25 to 175 EPG (average=83.3 EPG). No eggs of other parasites were found in donkeys examined. In total, 17 strongylid species were found in working donkeys: 2 species of Strongylinae and 15 of Cyathostominae (Table 1). From 6 to 11 strongylid species parasitized each donkey (average=8.9±3.1). Cyathostome species (prevalence=100%) dominated in the strongylid community; prevalence of the large strongylid species (Strongylinae) ranged 16.7–33.3%.

Comparison of our current data on the species composition of the strongylid community in working horses obtained by the *in vivo* method with our previous data obtained by the necropsy method revealed absence of significant differences ( $p < 0.05$ ) in species composition of strongylid communities. The results obtained confirm the possibility of the intravital study of the intestinal parasites of equids.

Comparison of the strongylid community of working horses from individual farms (24 strongylid species found) with the strongylid community of brood horses from large horse farms (30 species found) showed a decrease of biodiversity of the parasite community in working equids. In our opinion, working horses have a higher immunity against intestinal parasites than brood horses. The rather low level of horse infection by gastro-intestinal parasites in our study and the lack of evident clinical signs of helminthoses in working horses examined also confirm this point of view. Moreover, working horses from individual farms also have fewer opportunities for parasite transmission than horses at large farms.

Anthelmintic treatment is the main method of parasite control on various types of horse farms in Ukraine. According to our observations, working horses (and donkeys) from individual farms are usually not dewormed at all.

Based on the results obtained in the current study and our previous observations we elaborated a programme of parasite control in working equids for various types of farms in Ukraine. The programme combines anthelmintic treatment, rotation of pasture areas, and zoohygenic methods and has to be adjusted for the particular type of horse farm.

### Conclusions

All working equids examined were found to be infected with intestinal parasites. The level of infection was rather low. Species composition in the strongylid communities in working equids from the individual farms are depauperated compared with strongylid communities of brood horses from large horse farms.

It was found that the *in vivo* method of diagnostic deworming delivered reliable data on species composition and structure of intestinal parasite communities in working equids.

Programmes of parasite control elaborated for working equids in Ukraine have to combine anthelmintic treatment, rotation of pasture areas and zoohygenic methods and are to be adjusted for particular types of horse farms.

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## CHARACTERISTICS OF URBAN DRAUGHT HORSES WORKING IN THE CITY OF VALDIVIA, CHILE

T. Tadich<sup>1,2</sup>, M. Saez<sup>1</sup>, and A. Escobar<sup>1,2</sup>

<sup>1</sup> Instituto de Ciencia Animal, Facultad de Ciencias Veterinarias, Universidad Austral de Chile

<sup>2</sup> Programa de Bienestar Animal, Facultad de Ciencias Veterinarias, Universidad Austral de Chile  
tamaratadich@gmail.com

### Abstract

A survey of the morphological and individual characteristics of 207 urban draught horses of the city of Valdivia, Chile was performed. In order to obtain the information the clinical records of a free veterinary clinic (AMIVECC) between 1997 and 2009 were reviewed and other parameters were calculated using this information. The population of equines working in the city was classified according to draught or riding/speed type. Most horses working in Valdivia are geldings with an average age of 9 years, and with a conformation of a riding type of horse. Conformation of horses performing draught work is important since it can affect their performance and also their welfare. Further studies are needed in order to determine the efficiency at work of the horses used in Valdivia and their welfare status.

### Introduction

In Chile there are an estimated 304,000 horses [11], mainly used for sports and agricultural work, since animal power continues to be an important resource in agriculture. Horses providing draught work in the cities are not considered when agricultural censuses are performed, so there is no information about the quantity and type of horses used in urban areas. Although animal power can be provided by many species, the most commonly found in Chile are oxen and equines. The choice of the most suitable work animal will depend on climate, surface, diseases present in the area, the type of work performed, and, in some cases, social factors such as religion [1]. In Chile oxen are preferred for agricultural work, mainly in the central and southern part of the country, while horses are most commonly used for urban draught work.

The south of Chile, where the city of Valdivia is located, presents a temperate climate. In this city it is commonplace to see urban draught horses. These are mainly used for the transport of goods, especially wood and agricultural products for markets [2]. Their owners are usually lower-class groups located in the peri-urban areas of the city, and most of them have a tradition of working with cart horses, which in many cases are their main source of income. The horses used are mainly of the light type and do not seem to present the characteristics of classical draught breeds.

### Objective

The main objective of this study was to characterize morphologically and by sex and age the group of horses that performs urban draught work in the city of Valdivia.

### Material and methods

Information about 207 urban draught horses was obtained through a review of the clinical records collected by a free horse clinic (AMIVECC-UACH) in 1997–2009. The information used related to:

- Sex: whether mare, gelding, or stallion
- Age: calculated in years according to dentition and owner's information
- Conformation: information of height to the withers (HW), heart girth (HG), cannon bone perimeter, and elbow to tuber ischii length (EIL)

Estimated live weight was calculated using the following equation [4]:

$$\text{Live weight} = HG^2 \times EIL / 11,462.1$$

Baron's equation (AI) was used to determine the type of horse, where:

$$AI = HG^2 / HW$$

Descriptive statistics was used to analyse the data.

### Results

Horses used for urban draught work in the city of Valdivia are of mixed breed, and geldings are preferred over mares and stallions for work. The average conformation of these working horses is of a light type, not a draught type according to Baron's equation. The average height to the withers is 143cm, which is also the average length. The estimated live weight of the horses assessed is 353kg; and they have an average age of 9 years while working. See Tables 1–4.

Even though they do not have the characteristics of the typical draught horse breeds, it would be interesting to investigate their efficiency at work, since the maintenance of a light horse is economically advantageous for an owner.

**Table 1. Distribution of draught horses in Valdivia according to sex**

	Number	Percentage
Geldings	101	48.8
Mares	86	41.5
Stallions	20	9.7
Total	207	100

**Table 2. Average age in years, and age ranges of draught horses in Valdivia according to sex**

	Average age	Range
Geldings	10±5	10±5
Mares	8±4	1–20
Stallions	5±4	1–15
Total	9±5	1–26

**Table 3. Classification of draught horses in Valdivia according to Baron's equation and sex**

	A.I. average	% > 2.116	A.I. range
Geldings	1,98	24	2,7--0,4
Mares	1,98	30	2,88--0,26
Stallions	1,91	35	2,42 --1,24

**Table 4. Morphological characteristics of draught horses in Valdivia according to sex**

	Geldings	Mares	Stallions	Average
Height to the withers (cm)	143±9	143±9	144±4	143±9
Length elbow–tuber ischii (cm)	144±12	143±9	140±13	143±12
Heart girth (cm)	168±17	167±18	166±7	167±18
Cannon bone perimeter (cm)	20±2	20±2	19±2	20±2
Average weight (cm)	357±77	351±78	342±81	353±78

**Figure 1. Typical draught horse found in the city of Valdivia, Chile**

### Discussion

Each horse breed has different morphological and individual characteristics that make them more efficient for different tasks such as draught or speed/riding. This is why an appropriate selection of animals is important [5]. Breed, age, sex, and conformation were evaluated in the present study. The 207 horses assessed belong to mixed breeds (Figure 1), probably because of the easiness of economic access to this type. In general owners prefer to work with geldings (48.8%, see Table 1). These are easier to handle than stallions and they also avoid the lost of working hours that mares incur during late gestation, and the costs involved with pregnancy, such as feed supplementation [1]; this is similar to the tendency found for donkeys in Ethiopia [6]. The smaller group is represented by the stallions (9.7%). This class is, according to the owners, a sign of status and such horses are also used for Chilean races, where 2 horses compete against each other on a 200–300m race course, an activity that usually happens at weekends and with which betting is involved.

Draught horses are used during a wide age range (Table 2), with an average of 9±5, similar to the 8.5 years described in 2006 [1] and higher than the 7 years described in 1999 for horses of the same city [7]. The presence of very young working horses is worrying, 1–4 years, and similarly, old ones, over 20 years. The use of young horses has also been described in Mexico, where horses are already pulling heavy carts at the age of 3 years [8]. Working them before they are 4 years, when they reach their maturity, can be detrimental to their health, as skeletal development is not complete [4]. In the case of the elder horses, it has to be taken into account that after 12 years of age their work performance diminishes, with a lost of efficiency for their owners [7].

The morphological characteristics of height, girth, and elbow–*tuber ischii* length (Table 4) are the ones that can be used to identify a horse with the characteristics of a draught type. For this kind of work horses are preferred not to be too long, because this implies a minor speed response and transmission of force along the vertebral spine towards the area where the breast band is located, but not too short to avoid the hind limbs overreaching the fore limbs [7]. The optimum height to the withers for a horse performing light draught work is 150–60cm [5]. The mean height for the 207 horses was 143cm (±9cm), similar to the one described in other research about the city of Valdivia [7, 3], which is below that recommended for draught work. The large range in height (132–53cm) reflects the diversity of the types of horses used [4].

Weight was estimated by an equation modified for Chilean horses [4]. The average estimated weight was 353±78kg, geldings being the group with the highest average (Table 4). Size and weight are important when considering the actual energy input required by draught animals. On this basis when comparing working donkeys, ponies, horses, and oxen, the donkey represents the most effective animal for converting energy resources into work, being an advantage for frequent tasks requiring small amounts of power [9]. Baron's equation (A.I.) was used to determine if the horses can be considered as a draught type: if the A.I. is higher than 2.116 the equine is considered to be of a draught type and if it is lower it is considered as a speed/riding type [10]. The average A.I. calculated for the horses in this study was 1.96; none of the sex categories had an average A.I. above 2.116; with less than 50% of horses within each group categorized as a draught type (Table 3). This is probably due to the fact that it is economically more favourable for the owner to feed a lighter horse; on average draught horse owners spend US\$33 monthly on feedstuff and shoeing for their horses, while the average income of the families is US\$360 [1]. On the other hand, this type of light horse is also used by them in other activities such as riding and racing.

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## IMPROVING THE EFFECTIVENESS OF ANIMAL WELFARE SERVICE PROVIDERS. IT IS NOT JUST TRAINING!

M. Ali, R. Rao, and S. K. Pradhan

The Brooke Hospital for Animals (India), F-86 Preet Vihar, Delhi 110092, India  
alimurad@thebrookeindia.org

### Introduction

Service-providers such as community-based animal health workers, feed sellers, harness makers, farriers, and hair clippers play an important role in the welfare of working animals. In most communities these service providers are present and used by the community, and the types of services they provide are based on the need of that particular community. The Brooke India, an affiliate of the Brooke UK – an animal welfare charity dedicated to improving the lives of horses, donkeys, and mules working in the poorest parts of the world – has over many years worked towards training service providers to improve the welfare of working equids. It was believed that the local service providers lacked knowledge and skills and imparting these would directly improve the welfare of the equines. However, the field staff came to understand that such training often did not lead to a significant improvement in welfare. The teams held discussions with equine owners and service providers and found out that:

- The services were too expensive for the animal owners in respect of their daily earnings, and often the waiting time at the service provider was long.
- The materials suggested in training were not locally available, too expensive, and not the choice of the community.
- The trained service providers were not providing the service the owners required or were not being availed by the animal owners. They were not always available when the animal owners needed them.
- The trained service providers were not always preferred by the community.
- The individual equine owner has no other option than to accept the quality of service he received.

To overcome these problems between the demand of the community for particular services and the supply by the service providers, the team initiated a new approach by linking the service provider to the communities after mobilizing them into groups. These groups could address complex issues collectively instead of as individual animal owners in isolation. This paper provides a case study on how this approach improved the effectiveness of the service provider.

### Case study: Rawati village

Rawati is a village of the District Bijnor of Uttar Pradesh in India. There are 21 equine-owning households with a total of 40 equines. The equines are engaged in brick-kiln and pottery work during the summer and winter seasons, and the rest of the year they are used to transport goods and people. Initial interventions with the community resulted in the formation of an Equine Welfare Group in July 2008. The group acted together to improve the welfare conditions of their own animals through planning and monitoring collectively using various participatory exercises including participatory welfare needs assessments [1]. The group started a monthly collective savings scheme and loans taken from this have been used for purchase of feed, paying for treatment, buying horses and donkeys, repairing carts, and domestic household purposes. They identified important welfare issues related to service providers and management practices, and initiated collective actions through the group. Besides, they have negotiated with the local traders and procured feed ingredients in bulk for their equines, and have achieved much reduced costs which were not previously available in the locality. Collectively they have purchased ingredients and distributed them to individual members of the group. Collective monitoring is being carried out regularly to improve the welfare status of their animals; they share responsibility for individual and collective actions, and have regular follow-up reviews during group meetings.

The group recognized that animal-related stakeholders, such as farriers (blacksmiths), hair clippers, feed-sellers, veterinary service-providers, and medicine shopkeepers, play an important role in the welfare of their animals. During situational analysis the group used participatory tools such as cost-benefit analysis of service providers to analyse the constraints and opportunities relating to their use of the stakeholders' services. The local farrier was invited to join the group when it was formed. This provided the chance for an in-depth analysis to improve the quality of horseshoes and reduce the costs of shoeing. The group decided to purchase good-quality shoes made of better iron from the local market using their collective savings, and negotiated with the local farrier to reduce his charges for members of the group. He charges 60 Indian rupees (IR) per horse for a group member and IR80 for the same service outside the village. He also gives adequate attention to the requirements of their equines in respect of hoof condition, shoe size, trimming, and better quality nails. Such better quality service at reduced cost has led the animal owners to have more regular shoeing of the animals and a reduction in hoof problems. The arrangement also benefits the farrier: although the price he charges per horse is lower than before, group members bring their animals for shoeing on a more regular basis and have all 4 feet done instead of only 1 or 2 at a time.

Three other group members who were hair clippers in the past purchased hair-clipping machines using a loan of IR2,000 each from the group savings; 2 of them have subsequently repaid the loan and interest. They render their services to the group members for IR50 per equine while they charge IR70 for the same services outside the village. Such reductions in cost have enabled group members to save about IR480 annually.

The Equine Welfare Group has also established links with local veterinary service providers, medical suppliers, and a cart maker. They negotiated reasonable charges for good-quality services and mutual trust was built between the service providers and owners.

### Results and discussions

The effectiveness of service providers can be assessed looking at the *affordability* and *availability* of the services, and the *accessibility* and *quality* of the services provided.

The approach in the case study has resulted in increased affordability of the services for the community. The group negotiated lower service charges, and the collective savings made the services affordable without the owners becoming dependent on money-lenders who charge exorbitant interest, up to 60% per annum. The negotiations between the group and the service providers resulted in better relationships between the demand for the services and supply at the door step of the animal owners. The service providers provide the services at a more convenient time and at an appropriate place, thus improving accessibility of the services. On the other hand, the animal owners have a better understanding of the actual costs and time required by a service provider to deliver a good-quality service. The service providers are either part of the group or are invited to group meetings. This has improved the relationship between the 2 and created new opportunities for the animal owners to call for their services as and when needed. The need for improving the quality of the service is driven by the demand for a good-quality service by the community and not based on a need decided by an external organization. Demand and creation of a high-volume business opportunity has attracted these services providers to come to the village at a time convenient for the village, bring down their fees, and improve quality. Quality is addressed through sharing experiences and discussion between group members and service providers about handling and care of animals at the time of carrying out services, including putting animals in a shed and providing drinking water, etc. If training is required to strengthen the technical capacity of a service provider the training content is based on discussions with the community.

The case study shows that effective service delivery depends on participation of the local user community in deciding mechanisms of service delivery [2]. The services are provided on mutually agreed terms benefiting both animal owners and the service providers. In addition, the action taken by the group has increased the owners'



bargaining ability, self-confidence, and their motivation. Strong animal owners' groups able to solve their problems and resolve conflicts as and when they arise are central for the sustainable improvement of the livelihoods of the animal-owning communities [3].

### Conclusions

The group's efforts to link with local service providers have been essential in ensuring affordable, timely, and good-quality services for the horses and donkeys in their village, not only to improve welfare in the short term but also to ensure sustained improvement in the longer term [4]. Although training or skill enhancement is part of increasing the effectiveness of the service providers, mobilizing the community into groups and linking them with service providers is essential to make a sustainable difference to the animals.

### Acknowledgement

The contributions of involved equine-owning communities and all field staff of the Brooke India are gratefully acknowledged.

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## EXPERIENCES WITH COMMUNITY-BASED ANIMAL HEALTH WORKERS

D. Obiero, S. C. Onyango, and W. O. Okello

KSPCA Donkey Health and Welfare Improvement Project, POBox 24203, 00502 Nairobi, Kenya  
iamivadd@yahoo.com

### Abstract

*In Kenya the government halted the employment of veterinary surgeons and Animal Health Assistants (AHAs) in the year 1988. This led to the privatization of veterinary services. As economics would have it, the private practitioner opted to practise in high-potential areas and primarily on food animals. The Department of Veterinary Services in Kenya resumed the recruitment of veterinarians in the year 2009 with the employment of 100 veterinarians and 200 AHAs, a drop in the ocean as more than 20% of the veterinarians were awarded administrative positions and the AHAs number still relatively few when compared with the vast needy areas.*

*A clear disconnect was created between veterinary service provision and livestock, with the situation being worse for the 'non-food' animals. This paper describes the Donkey Health and Welfare Improvement Project (DHWIP), funded by the Donkey Sanctuary UK (DS-UK) and carried out through the Kenya Society for Protection and Care of Animals (KSPCA): it aims to deliver animal health service to working equines through Community-based Animal Health Workers (CBAHWs).*

### Introduction

The 1999 livestock census gave the donkey population at approximately 600,000 animals. The greater percentage of these animals exists in the arid and semi-arid areas (ASAL) of Kenya, where they are primarily used for transporting water and goods. Data collected by the DHWIP suggest disease prevalence is one of the major factors affecting donkey welfare in the ASAL. The DHWIP is working towards establishing linkages between veterinary surgeons, animal health providers, and CBAHWs. Community-based approaches to animal health services in Kenya have been evolving since the late 1980s. Previous studies in Kenya have shown a positive impact of CBAHWs, not only as a source of self-employment for community members, but also translating to reduced morbidity and mortality, and as an early warning system on disease occurrence, especially in the ASAL [1]. We believe that this is one of the ways of achieving sustainable health service provision. Such an exercise has been carried out in Mwingi and Kitui districts. The following describes the implementation of a CBAHW system in Mwingi East district. The number of CBAHWs trained was 10.

### Strategy

Our objective was to collaborate with other organizations with experience in community development and established and assessed CBAHW training programmes and networks [2]. This would help us add to our expertise and save on resources: we had only to add the donkey component. For this project we partnered with Food and Agricultural Research Management-Africa (FARM-Africa) [3], whose CBAHWs had already had training in agricultural animal medicine. FARM-Africa has an active AHA and CBAHW network; we proceeded by training the CBAHWs and later AHAs.

### Setting up the CBAHW programme

A needs assessment precedes a baseline survey, and means collecting essential data such as household income, livestock census, disease prevalence, etc. in the target area(s) which are to be used at different stages of the programme, including the critical evaluation stage. By utilizing opinion leaders/stakeholders within the target communities, farmers are helped to form groups with a maximum of 5 groups per area. The groups then nominate a member to be trained as a CBAHW.

**Structure**

After training, the CBAHW is linked to a government veterinarian in the area. The veterinarian is consulted on a needs basis, taking responsibility for intervention beyond the CBAHW's ability/training and participating in the evaluation of the trained CBAHW.

In this particular case the district selected was Mwingi East district and the selected farmers came from 2 areas, i.e. Nuu and Nzaluni, which together cover the larger part of the district. Five participants were selected from each area, representing a total of 10 communities.

**Training of CBAHWs**

A minimum of 3 training sessions are normally carried out within the first year of training. Initial training is followed by a second after 6 weeks, and a final one after 6 months. Refresher courses can then be held once a year. The bulk of the training sessions consist of practical instruction. The remaining time is given over to structured pictorial power point presentations and participatory focus group discussions (FGD). It is within this FGD that most of the theory is tackled. Participatory tools such as resource mapping, ranking, problem tree, seasonal calendar, hum, buzz, and answers on cards are utilized and modified to suit the situation and dictate the direction of discussion.

A reference manual is issued to trainees after the training. The manual is subject to regular review supported by feedback and comments obtained from them. Worthy of mention is the fact that the standardization for literature for CBAHW is not possible as, legally, they should not exist and thus have no training curriculum (discussed further below).

**Evaluation of the CBAHW programme**

Evaluation of the programme is via the use of questionnaires directed towards donkey owners/farmers and CBAHWs; face-to-face interviews with the CBAHWs; triangulation amongst the CBAHWs, donkey owners/farmer, and government veterinarians; and case record review. These mentioned tools are designed to extract information with a bias on number of donkeys treated, and increase in income attributed directly to donkey cases attended. The case records additionally provide direct feedback on previous training.

The success of the programme is thus based on number of donkey cases attended; increase in income attributed to attending donkey cases; and a favorable change in animal-based measures vis-à-vis the baseline survey data (BLS).

An illustration of the data obtained in the evaluation process is that of Winifred Ndege Mbula, one of the CBAHWs in Nzaluni/Mwingi who treats an average 21 donkeys in a month and earns an average US\$97 by this work. (The BLS showed that no donkeys were being treated in the areas of operation of the CBAHWs.)

**Challenges****Farmers' financial state/ignorance/poor attitude towards the donkey**

In Kenya, the ASAL areas have the highest rates of poverty, the lowest human development indices, and the least access to basic services compared with other areas. These areas have poor communications, weak market and supply chain linkages, a lack of water, poor access to social services such as education and health, and virtually no formal employment opportunities. The climatic and environmental factors in these areas are a constant threat to the communities' livestock and thus income. During monitoring and evaluation exercises, the most frequently obtained feedback from trained CBAHWs is that of a series of bad debts. Some farmers are either reluctant or unable to pay for medical services provided to their donkeys.

The situation for donkeys is worsened by the existence of cultural misconceptions about them, which demean their value. Some communities believe that a sick donkey cannot be treated, and thus exile the patient leaving it to its

fate, or they believe the 'cow vet' cannot treat donkeys. The resultant poor attitude about donkey welfare is one of the objectives our integrated approach hopes to address. However, the above factors mean practitioners may refrain from attending to donkey cases or they are called to attend only when a case has advanced so the prognosis is grave.

**DS provision of free veterinary health services**

Provision of free veterinary services to donkeys on DS field visits poses a challenge as far as creating sustainable systems is concerned. Most farmers will hold on to their sick animals awaiting the DS revisit, instead of consulting the CBAHWs. Some farmers are sceptical about the ability of the CBAHWs to treat their donkeys satisfactorily, and the farmers' financial constraints impact on their decisions to use the CMAHWs.

**The veterinary legislation with regards to the CBAHW system in Kenya**

The CBAHW provides an alternative animal health service in areas where no forms of veterinary service exist. Generally they are farmers who are not eligible for licensing by the national veterinary board. Consequently CBAHWs are providing the services illegally. In addition, the Veterinary Surgeons Act in Kenya regulates several aspects of the veterinary profession, including who should practise and the code of ethics. The Act specifies the minimum qualifications required for registration by the board. As it stands today, Diploma and Certificate holders in animal health do not qualify for registration or licensing and can practise only under the supervision of registered/licensed veterinary surgeons [4].

**Loss of trained government officers and CBAHWs**

The government reshuffles its staff every 3 years, translocating them to new areas; this hampers the welfare programme as the government officers trained in aspects of donkey medicine/husbandry and responsible for a given number of CBAHWs in an area move on to other work.

Furthermore, James Githuka of FARM-Africa reports that in previous similar exercises, some of the trained CBAHWs have stopped practising due to loss of interest or community politics, etc.

**Conclusions**

In spite of the challenges and successes experienced there is a long way to go to achieve our goal of the availability of minimum but appropriate veterinary services to all the needy donkeys in Kenya.

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## THE EQUINE FRIENDS: COMMUNITY-BASED ANIMAL HEALTH WORKERS (CBAHWS)

M. Z. Qureshi, S. Khan, S. Z. A. Shah, and M. S. Khattak

The Brooke, Opposite Telephone Exchange, Charsadda Road, Peshawar, Pakistan  
zaffar\_q22@yahoo.com, peshawar@thebrooke.org.pk

### Abstract

*It has been recognized that Community-based Animal Health Workers (CBAHWs) play an important role in the delivery of equine health services. As they are part of the community, they have a complete knowledge about the animals of their area. They are usually very helpful in the remote areas in providing first aid to needy animals. In such areas where veterinary services are neither available nor affordable, the need for them increases. The Brooke Peshawar has 32,104 equines in its catchment areas; it operates in 41 communities, organizing educational sessions and also providing veterinary treatment for sick animals. It was noticed that as Brooke Peshawar mobile teams visited each community once a week, so the provision for follow-up treatment for sick animals was a challenge, especially in areas where needy animals had no access to veterinary services in the absence of Brooke. The Brooke Peshawar took the initiative to select and train CBAHWs: they not only increase the Brooke's reach but they also provide veterinary services at affordable charges in the absence of the Brooke. The Brooke Peshawar has trained 14 CBAHWs in the last 4 years who are working in 14 different communities. They have treated more than 1,670 animals to whom no other service was available.*

### Introduction

A Community-based Animal Health Worker is 'Such a person who performs a limited range of veterinary tasks as defined by the statutory body in a given country'. It has been recognized that CBAHWs working with equine-owning communities play an important part in the delivery of equine health services, especially in the developing countries [1].

Being part of the community for which they provide veterinary services, CBAHWs can extend the outreach and efficiency of their national state veterinary services, e.g. by providing reports of disease outbreaks from remote areas which would not be otherwise regularly generated. At the same time CBAHWs can provide a basic clinical service to equine owners in places that are poorly served by veterinarians, public or private.

### The work of a Community-based Animal Health Worker

A CBAHW performs the work required by their equine-owning community. As these communities are disparate, their requirements for local veterinary care can also be diverse. In general, however, a CBAHW has most of the following characteristics. The CBAHW

- is a member of the community
- is knowledgeable about animals
- is selected by the community
- is trained for a short period
- charges minimum fees for services provided
- reports disease outbreaks

A CBAHW is expected by local equine owners to be an accessible person who can treat common diseases of their animals for an affordable fee. However, a CBAHW can also be involved in disease surveys and control programmes, and can also play a key role in organizing community awareness sessions.

### Why Brooke Peshawar needed CBAHWs

The Brooke Peshawar has been providing free veterinary services to working equines since 1991. According to the

Government Livestock Census 2006 [2], the equine population in Peshawar and Charsadda District was 63,105 heads out of which 8,573 were horses, 53,638 were donkeys, and 894 were mules. Peshawar Centre has 6 mobile teams and 2 static clinics. The Brooke Peshawar has organized 41 communities in Peshawar region. The equine population in these 41 communities is about 3,000 heads. Most of these communities are located in remote areas. These areas either lack veterinary services or contain unaffordable veterinary services with untrained service providers. As Brooke teams visit these communities only once a week, on the remaining days the sick equines are deprived of follow-up treatment. CBAHWs could make available follow-up veterinary services and also emergency treatment, at affordable fees, and could also give advice to owners in the absence of the Brooke.

### Materials and methods

The Brooke Peshawar decided on a 1-month training for CBAHWs. The course curriculum and contents were prepared. The course was designed to cover the following aspects:

- Equine management
- Basic management practices
- Equine health

Different materials, such as posters, charts, and leaflets were then prepared to create interest in the idea of CBAHWs. Later a book, Equine Health and Husbandry, was written in Urdu and distributed amongst the CBAHWs. The basic CBAHW training was of 30 days duration, consisting of:

- Theoretical and practical training, 15 days (Figure 1)
- Fieldwork, 15 days

Figure 1. Practical training session



It was also decided to hold a 1-day refresher course after every 3 months, not only to get feedback from the CBAHWs, but also for the CBAHWs to share their experiences with each other.

After designing the course curriculum, course contents, and publicity materials etc., selection criteria were chosen, according to which a CBAHW

- will be a community member
- is knowledgeable about the animals
- will be selected with community consensus
- will be educated (some primary education or high)

The CBAHW basic training was organized at the static clinic at the Peshawar Centre. During the 15 days of theoretical and practical sessions, different training techniques were used, i.e. presentations, demonstrations,



group discussions, use of different extension materials, while all the practical sessions were performed at the static clinic, utilizing the admitted animals. Different Veterinary Officers of the Brooke Peshawar presented different topics. During the 15 days of fieldwork, the trainee CBAHWs were attached to different mobile teams. They visited different communities, where they were engaged in community-awareness sessions as well as in the provision of veterinary services

After training was completed, the record keeping method was discussed with the CBAHWs. They were advised to maintain complete records of animals they had treated.

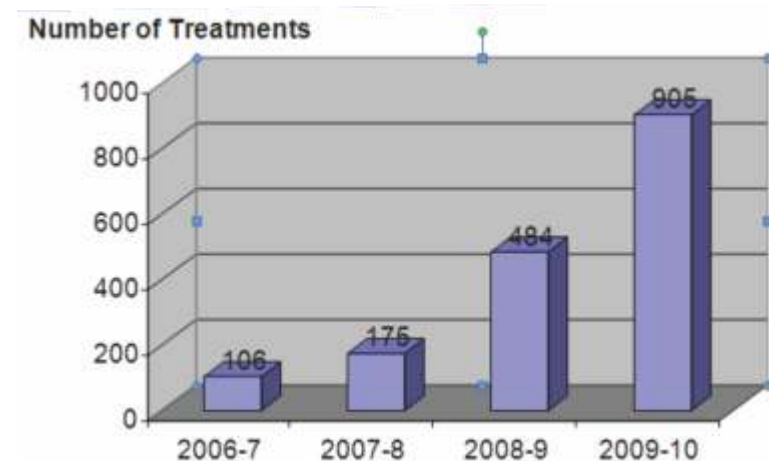
**Results**

The Brooke Peshawar had conducted 4 CBAHW training programmes and trained 14 CBAHWs up to March 2010. Details of training conducted and CBAHWs trained are given in Table 1. Figure 2 shows the total number of animals treated by CBAHWs between March 2006 and March 2010:

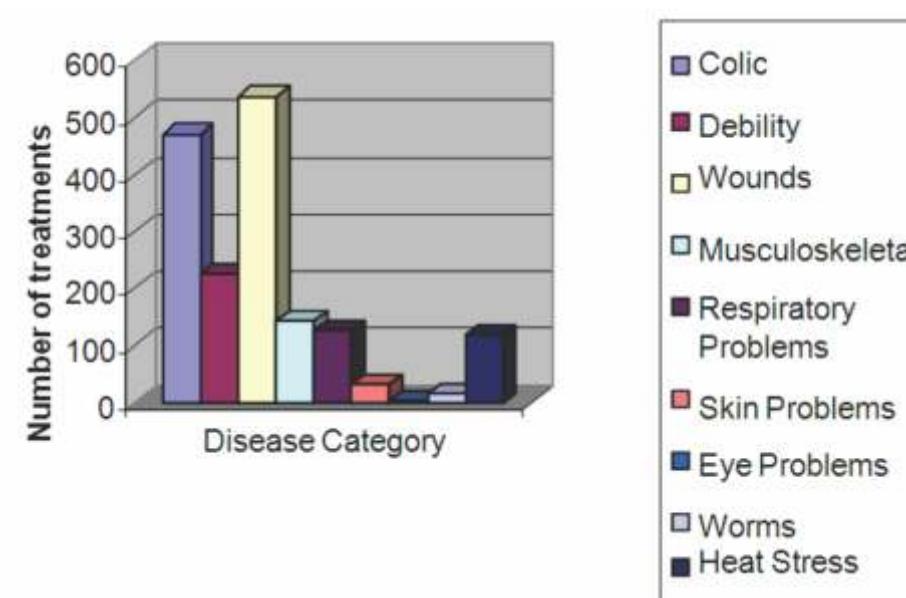
**Table 1. Number of CBAHWs trained per year**

Ser	Year of CBAHW training	Number of participants
1	2006	2
2	2007	4
3	2008	4
4	2009	4
Total		14

**Figure 2. Animals treated by CBAHWs per year**



**Figure 3. Categories of disease treated by CBAHWs**



**Figure 4. CBAHWs at work in the community.**



**Discussion**

The Brooke Peshawar has trained 14 CBAHWs to date, and they are providing veterinary services in different communities by charging affordable fees. These CBAHWs not only provide follow-up treatment but also emergency treatment to sick equines. They are a means of increasing the reach of the Brooke Peshawar. They are helpful in organizing different community-awareness meetings as well as identifying new communities in Brooke operational areas. They not only refer seriously sick animals for admission to the static clinics of Brooke Peshawar but also identify worn out animals for euthanasia. The CBAHWs act as real animal friends by providing veterinary services to seriously sick animals, even during the night. They also advise their owners on how to avoid malpractices.

The trained CBAHWs perform an important role in animal welfare, but there is a great need to train more to cover

the many animals needing services. The training programme has increased the credibility of both Brooke and CBAHWs in their respective areas as both being very useful to working equine communities. The CBAHWs have filled the gap between the Brooke and equine communities. They have fulfilled the need for emergency treatment provision at night when there is no veterinary service available, even from the Brooke.

#### Lessons learned in the programme

Being part of the communities, CBAHWs are very helpful in dealing with emergency cases, even at night: they provide first aid treatment in colic and accidental wound cases. They are also helpful in reporting an outbreak of disease in good time, and play a vital role in preparing the disease control programme. As Brooke visits a community once a week, so the CBAHWs provide follow-up treatment for the sick animals; they also help the community by referring the needy animals to the Brooke Hospital for admission. CBAHWs are also useful in organizing different community meetings.

Although the CBAHW programme is effective there are still some challenges. Due to the high illiteracy rate, it is sometimes difficult to find a suitable person to train as a CBAHW. In some communities, people hesitate to pay the fees charged by CBAHWs as they expect free medicines from them. Because of the income some CBAHWs do not take much interest in their work and do not attend the number of cases expected by the Brooke. Certification to practise by government authorities is also a challenge.

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## PARAVET TRAINING: A SPANA INITIATIVE IN NORTHERN MALI

A. Doumbia

SPANA Mali, BP E-3940, Rue 77, Porte 54, Badalabougou, Bamako, Mali  
spana@cefib.com

#### Introduction

In the context of the socio-economic reintegration of former rebel combatants and consolidating peace and economic development in the northern regions of Mali, SPANA has initiated the Animal Health & Production Support Project (French acronym: PASPA). The species involved are sheep, goats, camels, horses, and cows [3].

#### Context

In northern Mali, draught animals and those bred for meat have an important role to play in economic activities. Unfortunately, this situation has been affected by the following constraints:

- Considerable reduction in flock size since the 1990–5 rebellion and also because of the 1992 drought
- Shortage of material and human resources from the regional services of the Ministry of Livestock and Fisheries
- Shortage of private vets [2]

#### Objectives of PASPA

The main goal is to help communities of livestock farmers in the affected regions to improve the health and productivity of their animals. This project relates to the training of auxiliary vets ('paravets') in camps and villages in the regions of Tombouctou, Gao, and Kidal, and includes:

- Training and equipping paravets in the field of veterinary care and animal production
- Strengthening the capacities for organisation amongst nomadic and static communities with regard to animal husbandry and management
- Strengthening the capacities for intervention of regional veterinary services from the Ministry of Livestock and Fisheries and from private vets.

#### Methodology

The strategy is based on setting up a network of paravets (leaders) who are selected by the communities themselves according to precise criteria, and who are considered capable of providing community leadership functions in the field of basic animal health.

The first phase of the project took place in 2001–3. Selected farmers were trained in basic animal health, as organised by SPANA. Farmers, once trained, were equipped with supplies and veterinary medicines so that they could provide animal health services for their respective communities.

Following training, trainees were upgraded to paravets to provide support for the local veterinary services responsible for serving their respective communities. Each paravet received a medicine allowance of \$220 to cover operating funds, plus a small medical care float of \$150, with monthly support from SPANA of \$45 in the first year, \$32 in the second year, and \$21 in the third year. The average monthly wage was \$90. In return, the paravets had to produce a monthly report.

Activities were monitored and evaluated by a joint mission between SPANA, veterinary services, and CAR/North. Monitoring was performed every 3 months, and supervision was provided by the SPANA team twice per year. At the end of each year, the paravets' impact on their communities was analysed, including their contribution to improving the state of health of animals, and the improvement of community revenue to cover costs.

**Results**

Following the first phase of the project, an assessment of project impact yielded the following results:

- Of the 20 paravets trained, only 13 were still operating (with operating funds still in existence and an improvement in the animals' state of health).
- Despite SPANA's support with monthly payments, it had not been possible for the 7 sites to manage their operating funds, and they remained without medicines with which to continue their activities.
- Communities had not managed to fulfil their commitment to the project because they had not provided any progressive funding of paravets.
- The success of activities was compromised by the inefficiency of the management committees at several sites.

Following this assessment of the first phase of the project the methodology was changed, taking account of the observed shortcomings. Accordingly, for the second phase, the following criteria were adopted:

- With regard to selecting leaders, the fact of having been a rebel combatant was no longer taken into account given that the priority was to initiate the project in a global development framework.
- With regard to the duration of project phases, this was reduced to 2 year rather than 3 years, as this would make it possible to improve the coverage effect (instead of 20 every 3 years, there will be 10 per year)
- With regard to local management, the project was placed under the organisational control of municipal authorities rather than a management committee.
- With regard to training, this was provided every year for 10–15 leaders with a refresher course after 6 months.

In this second phase, which has been ongoing since 2004, a total of 72 paravets have been trained and 43 are in operation. The CPD training and medicine provision have improved in this stage, and have helped improve results.

**Results of external assessment [4]**

The results of assessments reflect a positive impact on socio-economic development in participating communities. In 2008, the numbers treated per paravet in their communities corresponded to 9,000 animals (sheep, goats, camels, horses, and cows) [1]. The figure was 1, in 2002 and 7,243 in 2008. See Table 1.

**Table 1: Number of animals treated by species**

Sheep	Goats	Camels	Horses	Cows	Total
54,644	40,679	5,358	101,574	162,735	<b>364,990</b>

An assessment performed in February 2008 by independent research office 'GAP' (Groupe d'Appui aux Programmes = Programmes Support Group) yielded the following results:

All of the original paravets we encountered are doing extraordinary work. It's true that some of the first paravets trained had abandoned the role for reasons relating to promoting socio-economic integration: recruitment within a different organisation, opportunities to work in other areas – to name but a few reasons.

Out of 26 sites visited by the assessment team, the level of coverage is recorded Table 2.

**Table 2. Site coverage by paravets**

Region	Sites visited	Sites with working paravet	Percentage of working sites
Tombouctou	13	11	84%
Gao	13	9	70%
Total	26	20	77%

**Project repercussions**

The repercussions of the Animal Health & Production Support Project are as follows:

- There is a marked improvement in public health, which can be measured by the quality of meat and by the quantity of milk. Members of the Intarkat management committee confirm that farmers are beginning to appreciate the real value of paravet services, in reducing the direct administration of drugs to their herd or flock, and arranging vaccination campaigns. Information about new cases of epidemics is broadcast in record time, from fixed-base vets in Tombouctou, Goundam, and Gao who receive information promptly from the paravets living onsite with farmers.
- Many paravets' lives have changed. We have found that the service provided by them is enabling them to counteract poverty: the work is helping to provide them with a living.
- All of the new paravets we met are working with various degrees of success. The approach taken by farmers has changed, with regard to the effectiveness of treatment of their animals by the paravets.
- Mindsets are beginning to change when it comes to considering the quality of veterinary products. At one time or another, all animal owners have administered medicine themselves with counterfeit imported products accessible to all. However, they acknowledge the difference in effectiveness of products employed by paravets trained by SPANA.

**Long-term effects**

The long-term effect of this operation hinges on the presence of an operating fund (\$220) for the purchase of medicines, the scope for remunerating CAHWs from the profit margins from the sale of medicines, well-organised services, and a partnership established between communities on the one hand and private and public vets on the other. See Table 3. The management system is appropriate for the situation prevailing within the community. The quality of communications between the regional partner, the paravets, and the technical services are benefits which may help to sustain the long-term effectiveness of the project.

**Table 2. Costs of some aspects of the project, 2009**

Designation	Cost (\$US)
Training	6,020
Equipment	3,010
Medicines	2,150
Running costs	21,300
Total	32,480



**Conclusions**

Despite problems encountered, principally the lack of efficiency amongst management committees, the presence of counterfeit drugs on the market, and lack of organisation amongst farmers, the project has been a qualified success. In its 9 years of existence, PASPA has contributed not only to the socio-economic integration of a large number of paravets but also to an improvement in animals' productivity, and consequently an improvement in farmers' income. This represents a good example of the part played by animal charities in the struggle against poverty.

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## DEMONSTRATIVE FEEDING AND WOUND MANAGEMENT PRACTICES ON WORKING EQUINES: STONE-CARRYING DONKEYS AND GHARRY HORSES IN SNNP REGION, ETHIOPIA

G. Degefa, B. Asefa, M. Negash, and N. Gebrie

The Brooke Hospital for Animals, PO Box 1554 code 1250, Addis Ababa, Ethiopia  
 gorfu@thebrookeethiopia.org

**Abstract**

*Two groups of working equines (stone-carrying donkeys and gharry horses) were identified by the Brooke Hospital for Animals in Ethiopia as being exposed to a high level of risk of poor welfare due to work and the husbandry practices used by their owners. The organisation worked closely with owners to undertake welfare assessments of these animals to determine the key issues, and also facilitated a knowledge, attitude and practice study with the owners to identify priority problems from their perspective. Poor body condition and wounds were seen as being major issues, and a pilot intervention was developed to test the use of improved feeding using cheap locally available materials, and basic wound management. Fifteen animals (5 donkeys and 10 horses) along with their owners were selected for the trial, and monitored by regular visits over 3 months. Over the trial period, all the animals showed improvement in body condition and either complete healing and reduction in wounds. It is necessary to develop a simple monitoring system that the group can use to ensure long-term change, and identify any animals needing additional help. This experience will be shared by the owners with other equine owners as a means to increase uptake.*

**Method: pre-intervention assessments**

Welfare assessment using the Bristol Welfare Assessment tool [1] was carried out by Brooke staff on 26 donkeys and 35 gharry horses. See Table 1.

**Table 1. Welfare assessment results**

Stone-carrying donkeys (5)	Gharry horses (10)
<ul style="list-style-type: none"> <li>• Body condition: all were scored as thin</li> <li>• Lesions: most had severe and deep lesions on girth, belly, wither, spine, hind quarter, tail, or tail base</li> <li>• Parasites: half had external parasites (ticks and bot eggs), etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Body condition: most were scored thin, and few medium</li> <li>• Body lesions: on wither and spine, girth and belly, hind quarter, fore leg, lip lesion, etc.</li> </ul>

**Method: owners' Knowledge, Attitude, Practice (KAP) analysis**

Key areas leading to poor welfare were identified by owners, as shown in Table 2.

**Table 2: KAP results from owners**

Donkeys	Horses
<ul style="list-style-type: none"> <li>• Lack of feed</li> <li>• Lack of water</li> <li>• Overloading, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Overloading</li> <li>• Whipping/beating</li> <li>• Shortage of feed</li> <li>• Hoof problems, etc.</li> </ul>

**Method: feeding and wound management intervention**

This was designed with the owners to address the key findings of the KAP analysis and the welfare assessments:

- Number of demonstration dates = 10 (6 for donkeys and 4 for horses)
- Number of animals selected for the demonstration = 5 donkeys and 10 horses
- Project duration = 3 months
- As a result of this intervention the following changes were achieved:
  - 100% improvement in body condition of the targeted equines
  - 75 % of treated animals had decreased number of body wounds

**Steps followed**

- Body condition indicators set through community dialogue: good, medium, and poor
- Improved feeding practices exercised
- Each animal was seen every 2 weeks and the data recorded and analysed.

**How to make an improved feed mix?**

Cheap, locally available materials were selected as follows:

- 2kg (for donkey) and 4kg (for horse) of wheat bran mixed with
- 150ml edible oil and
- Water

**Practical demonstration on wound management**

Owners were shown how to treat wounds themselves:

- Use 1 teaspoon table salt diluted in 1.5 litres of clean water to wash the wound
- Use a simple blade to shave hair around the wound
- Use a clean piece of cloth, if possible a towel, to wash debris from the wound
- Use vaseline to rub on the edges of the wound to soften the skin

**Results after 3 months****Table 3. Results of the intervention**

Animals	Before 3 months	After 3 months
Animal 1 (D)	<ul style="list-style-type: none"> <li>• Poor body condition</li> <li>• Dirty feeding trough</li> <li>• Watered once daily</li> <li>• Fed once daily</li> <li>• No improved feed mix</li> <li>• No wounds</li> <li>• Sign of internal parasite</li> </ul>	<ul style="list-style-type: none"> <li>• Medium body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed twice daily</li> <li>• Improved feed mix twice a week</li> <li>• Treated with antibiotics and dewormed</li> </ul>
Animal 2 (D)	<ul style="list-style-type: none"> <li>• Poor body condition</li> <li>• Dirty feeding trough</li> <li>• Watered once daily</li> <li>• Fed once daily</li> <li>• No improved feed mix</li> <li>• Severe wound with worm on it</li> <li>• Sign of internal parasite</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed once daily</li> <li>• Improved feed mix 4 days a week</li> <li>• Wound healed</li> <li>• Sufficient rest with additional feed</li> </ul>

Animal 3 (D)	<ul style="list-style-type: none"> <li>• Poor body condition,</li> <li>• Dirty feeding trough</li> <li>• Watered once daily</li> <li>• Fed once daily</li> <li>• No improved feed mix</li> <li>• Severe wound at the back</li> <li>• Sign of internal parasite, not active</li> </ul>	<ul style="list-style-type: none"> <li>• Above medium but not fully in good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed twice daily</li> <li>• Improved feed mix twice a week</li> <li>• Wound healed</li> <li>• Dewormed</li> </ul>
Animal 4 (D)	<ul style="list-style-type: none"> <li>• Poor body condition</li> <li>• Poor feeding trough</li> <li>• Watered once daily</li> <li>• Fed once daily</li> <li>• No improved feed mix</li> <li>• Severe wounds at the back, hind quarter, etc.</li> <li>• Sign of internal parasite</li> </ul>	<ul style="list-style-type: none"> <li>• Medium body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Improved feed mix every 2 days in a week</li> <li>• 75% of wounds healed</li> <li>• Dewormed</li> </ul>
Animal 5 (D)	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered twice daily</li> <li>• Fed twice daily</li> <li>• No wounds</li> <li>• Active and young</li> <li>• Used as a control</li> </ul>	<ul style="list-style-type: none"> <li>• Nearly in good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed twice daily</li> <li>• Improved feed mix every 3 days</li> <li>• Not engaged in heavy carrying</li> <li>• Sufficient time for grazing</li> <li>• No wounds</li> </ul>
Animal 6 (H)	<ul style="list-style-type: none"> <li>• Poor body condition,</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed twice daily</li> <li>• No improved feed mix</li> <li>• Eye problem</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• Improved feed mix (4kg wheat bran mixed with 150ml oil and water), and additional feed such as barely 1.25 kg per week, others</li> <li>• Signs of epizootic lymphangitis</li> </ul>
Animal 7 (H)	<ul style="list-style-type: none"> <li>• Poor body condition,</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• No improved feed mix</li> <li>• Sign of internal parasite</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• Improved feed mix (4kg wheat bran mixed with 150ml oil and water) and additional feed such as sugar cane, others</li> </ul>

Animal 8 (H)	<ul style="list-style-type: none"> <li>• Medium body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed twice daily</li> <li>• No improved feed mix</li> <li>• Sign of internal parasite</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• Improved feed mix (4kg wheat bran mixed with 150 ml oil and water) and additional feed such as barley 1kg every day, others</li> </ul>
Animal 9 (H)	<ul style="list-style-type: none"> <li>• Poor body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• No improved feed mix</li> <li>• Sign of internal parasite</li> <li>• Wounded</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• Improved feed mix provided only 3 times, then the owner stopped</li> <li>• There is knee lesion</li> </ul>
Animal 10 (H)	<ul style="list-style-type: none"> <li>• Medium body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• No improved feed mix</li> <li>• Sign of internal parasite</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• Improved feed mix (4kg wheat bran mixed with 150ml oil and water) and additional feed such as sugar cane, barley, and others</li> </ul>
Animal 11 (H)	<ul style="list-style-type: none"> <li>• Medium body condition</li> <li>• Poor feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• No improved feed mix</li> <li>• Sign of internal parasite</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Dirty feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• Improved feed mix (4kg wheat bran mixed with 150 ml oil and water) and additional feed such as sugar, others</li> </ul>
Animal 12 (H)	<ul style="list-style-type: none"> <li>• Medium body condition</li> <li>• Poor feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• No improved feed mix</li> <li>• Sign of internal parasite</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• Improved feed mix (4kg wheat bran mixed with 150 ml oil and water) and additional feed such as sugar cane, others</li> </ul>

Animal 13 (H)	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• No improved feed mix</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• Improved feed mix (4kg wheat bran mixed with 150ml oil and water) and additional feed such as sugar cane, others</li> </ul>
Animal 14 (H)	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• No improved feed mix, sometimes given raw egg</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• Feed such as sugar cane, barley provided</li> <li>• Animal not interested in improved feed mix (wheat bran mixed with oil and water)</li> </ul>
Animal 15 (H)	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• No improved feed mix, sometimes given raw egg, sugar cane</li> </ul>	<ul style="list-style-type: none"> <li>• Good body condition</li> <li>• Good feeding trough</li> <li>• Watered 3 times daily</li> <li>• Fed 3 times daily</li> <li>• Improved feed mix (4kg wheat bran mixed with 150ml oil and water) and additional feed such as sugar cane, others</li> </ul>

D=donkey, H=horse

**Observations**

- The vet recommended that almost all the animals be dewormed.
- Both demonstrative feeding and wound management interventions needed a maximum of three months
- Most of the gharry horse owners' family members (wife and children) were also involved in preparing the improved feed mix.
- Rest, for wounded and thin animals, is vital to bring about improvement in their wounds and body condition.
- Water is one of the problems identified by the KAP study and owners are forced to provide stagnant water for their donkeys. The issue of water remains difficult during the dry season.
- During the visits, inconsistency in body condition improvement was observed. For example, the body condition of animal 5 was above good at the 5th, but dropped slightly at the 6th assessment.
- After such intervention there has to be a mechanism where owners can regularly monitor the body condition and wounds of their animals.
- The frequency of improved feed mix provision by owners is generally 2–3 times for donkeys and 4 times in a week for gharry horses. In addition, owners were engaged in daily routine management practices (rest, additional feed, watering, use of cleaned feed trough, etc.)



**Recommendations**

- Organise community discussions between the group and other groups and members of the community where the Brooke is thinking of practising this intervention in the near future, as a means of sharing and scaling-up these practices.
- Pilot 'Traffic Light Intervention' to engage owners in regular follow-up of body condition improvement. This would allow them to assess body condition and wounds as a group, and identify any animals requiring increased attention.
- The organisation, in partnership with animal owners, should establish an award ceremony to motivate groups.

**Reference**

[1] Pritchard, J.C., Lindberg, A.C., Main, D.C.J., and Whay, H.R. (2005). Assessment of the welfare of working horses, mules and donkeys using health and behaviour parameters. *Preventive Veterinary Medicine* 69. 265–83.

**THE PEDAGOGY OF JUSTICE: EXPERIENCES FROM CAIRO****L. Iskandar**

CID Consulting, Cairo, Egypt

Educational systems in the south have not achieved what they were set out to achieve for their populations: people have not been engaged in sustainable economic growth, poverty eradication, human security, etc. It is clear that we require a fundamental rethinking of learning systems to confront the current challenges of poverty, exclusion, and illiteracy. Solutions are related to deep political failures which result in large numbers of impoverished adults having to send their children to work. But while these failures require interventions on a macro scale, solutions at the micro level can help children leap out of the poverty and exclusion cycle, allowing them to map a different future from the one their parents had to suffer.

Solutions draw on a multidisciplinary, bottom-up approach to develop learning systems which guide the delivery of educational opportunities to the dispossessed. Since one of the main reasons people are excluded from formal schooling is the necessity to go out to work, be it in fields, in workshops, or in the home, non-formal education inherently links the learning process to work-related and income-generating contexts. It anchors learning in local practice and indigenous knowledge of how to work, earn income, trade, access credit, and organize communities.

Non-formal education is grounded in the popular economy. It creates from that work arena a vast 'school' or 'learning space', within the informal economy. In large measure it revolves around self-employment such as street-vending or crafts co-operatives, barter, exchange, local production, and family-owned businesses, etc.

Such schemes allow youths to create their own paths towards sustainable development. Through practical skills training in the informal economy, one of the few means that are left to address the dire situation of excluded youths is invested in.

In Egypt, CID Consulting has been piloting experiments to transform informal sector working places into non-formal islands of learning. These have largely centred on recycling communities and brick-making factories in Egypt. The pedagogy of justice is adopted in these 'islands'.

Since education and development are inextricably intertwined, to produce change CID searches for points of intersection where these can be brought together. Starting from the premise that development is a long-term intergenerational process, we focus in a major way on adolescents and children. The basic research and design questions around which CID's work revolves are:

1. How can we provide people/working children with an opportunity to learn?
2. What kind of learning content do they need to acquire
3. How should we design the learning programme? Their labour is needed for basic family survival. Withdrawing them from that labour and having the family go hungry – them included – is not the answer.
4. How can we keep them learning within their trade and the market?
5. How can we uphold the positive aspects of their indigenous knowledge in their specific trade and alter the negative aspects?

We need innovative methods of non-formal basic education so that those who are caught in the poverty trap and cannot access formal schooling can still learn, contribute, and break out of the endless cycle of poverty and oppression. We adapt these methods to each specific group, its culture, its aspirations, its daily realities, and learning needs. This learning is upheld by UNESCO, practitioners, and international agencies. We decided to anchor learning in the local practice, the joy of working, the fulfilment of earning income, the dynamism of trading, accessing credit, and the imperative of organizing communities.