

# Selected health and management issues facing working donkeys presented for veterinary treatment in rural Mexico: some possible risk factors and potential intervention strategies

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**Abstract** The examination of 216 donkeys presented for treatment at the Donkey Sanctuary–World Horse Welfare–Universidad Nacional Autonoma de Mexico mobile clinics revealed a number of health and welfare problems. A general overview of the donkeys' health was made and showed that the median body condition score (BCS) in this population was 2.5. Underweight animals only accounted for 26% of the population. Females, 0–5-year-olds and >21-year-olds, were more likely to be underweight. When analysed, there was no correlation between faecal worm egg count (FEC) and BCS. The prevalence of strongyle infection as assessed by FEC was shown to be 80% with a median FEC of 600 eggs per gramme. Donkeys were assessed for body lesions and showed a high prevalence (71%), particularly in the facial region (54%). Analysis showed that mature animals (6–15 years old) were

at increased risk of body lesions compared to older animals (16+ years old) as were donkeys with dental disease and those in particular villages. Risk factor analysis for lesions of the face showed that stallions and geldings are at increased risk as were donkeys wearing halters made from nylon rope. This study has identified areas for further investigation and potential areas where targeted interventions may be made to improve the health and welfare of working donkeys in Mexico.

**Keywords** Donkey · Mexico · Welfare · Health

## Introduction

Working donkeys are a common part of rural life in many parts of Mexico with an estimated population of over 3.3 million donkeys (Starkey and Starkey 2000). Working equids are very important in Mexico, contributing significantly to the rural economy and to the section of the population which relies upon the land to survive. Over 30% of the population of Mexico live in rural areas and 4% of the country's GDP directly results from agriculture (CIA 2009). Donkeys, horses and mules are invaluable to small holding farmers with only 8% of these farms possessing a tractor. Donkeys have been used in Mexico since their introduction in the fifteenth

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century by the conquistadors and have been valued for their hardiness, ease of use, tractable nature and ability to survive in a hot climate often on poor rations.

Welfare of the donkey population of Mexico has been investigated previously with authors stating that donkeys “are often abused, insufficiently fed and in general neglected” (de Aluja 1998) and describing that “poor nutrition of donkeys is a severe welfare problem in developing countries such as Mexico” (Carretero-Roque et al. 2005). More recent studies have also revealed that high levels of parasite infection (Valdez-Cruz et al. 2006) and serious dental abnormalities (Fernando-Martinez et al. 2006) are commonplace in the working donkey population in Mexico.

Animal welfare organisations such as The Donkey Sanctuary (DS) and World Horse Welfare (WHW) have been working in Mexico in partnership with the Universidad de Nacional de Autonoma Mexico (UNAM) for 17 years providing veterinary care for donkeys, horses and mules; education programmes for owners; and training for vets, farriers and allied professions. Many of these programmes have carried out ‘routine’ treatments such as de-worming and farriery for many years with only limited scientific evaluation and monitoring. Welfare organisations and owners are often primarily concerned with poor body condition (Valdez-Cruz et al. 2006; Svendsen 1997) and the effect that this has upon the health and working ability of the animal in question; traditional interventions have relied upon de-worming, providing some basic nutritional advice and some routine dentistry.

Little is known about the welfare problems faced by working donkeys in rural Mexico, particularly when veterinary and management practises together are regarded as part of a holistic view of donkey welfare. The aim of this study is to determine the health and welfare problems facing a cross section of the donkey population in rural Mexico during the month of May. May is the end of the dry season with particularly sparse grazing and high temperatures, leading to a challenging environment for donkeys and their owners alike. This study attempts to identify key areas of interest for stakeholders such as The Donkey Sanctuary, owners and veterinarians so that intervention strategies may be developed using sound scientific evidence of donkey problems, needs and solutions.

## Materials and methods

### Donkeys and data collection

A total of 216 donkeys were examined: 51% (111) were entire males, 18% (39) were castrated males and 31% (66) were females. The median age range of donkeys studied was 6–10 years old with 41% (88) of donkeys being in this age bracket; 26% (57) of the study population were 0–5 years old, 8% (17) were 11–15, 16% (34) were 16–20 and 9% (20) were over 21 years old. All donkeys ( $n=216$ ) present for treatment at eight DS–WHW–UNAM clinics over a 2-week period during May 2008 were examined for this project. It was recorded if animals had previously been treated by a DS–WHW–UNAM team and when. Donkeys were examined in the temperate area surrounding Mexico City ( $n=98$ ) (Morelos, Puebla, Querataro, Coalco, Tequisquiapan) and in the tropical area of Veracruz State ( $n=118$ ) (Cerro Colarado, Pasa de Limon, Martinica, Plan de Arroyos).

Donkeys’ ages were estimated by an experienced veterinarian by examining incisor occlusal appearance. As precise ageing was impossible, age was classified into five groups: 0–5, 6–10, 11–15, 16–20 and  $\geq 21$  years. Body condition score was assessed on a scale of 1–5 including half scores with 1 being emaciated and 5 being obese. With the permission of owners, all donkeys were examined for health problems, had a faecal sample taken for parasite burden estimation and had their harnesses examined. The majority of the donkeys (203) had a dental examination using a Hausmann’s gag. Donkey owners were also asked about the diet of their animals and their medical history. A summary of information collected is shown in Table 1.

Donkey faecal samples were analysed in the field using the FECPAK F100® system (FECPAK International) for assessment of strongyle worm egg count. Donkeys were thoroughly examined for any body lesions. These were subsequently graded according to their depth and location. Grade 1 applied to superficial abrasions with erosion of skin and loss of hair, grade 2 lesions had the skin and subcutaneous layer broken with associated inflammation and grade 3 lesions were deep lesions with wound exudate and possible contamination. Areas showing only minor hair loss were not included in this study as their cause and impact on animal welfare were unclear. Har-

**Table 1** Donkey data collected for each animal ( $n=216$ ) by observation, examination and owner interaction

Variable	Measurement
Age	According to dental tables within 5-year categories
Sex	Female, gelding, stallion
Location	Location of mobile clinic site
Use	Agricultural draught, riding, pack, cart, other (e.g. foal of working mother or non-working breeding mare)
Previous treatment	Recorded when last treatment of donkey was (if ever) by DS teams
Body condition score	1–5 Scale with 0.5 increments
Strongyle worm egg count	Eggs per gramme (epg) of faeces
Feeding	
Pasture availability and type	Dry, poor-quality pasture Lush, green pasture
Supplementary feeding	Provision of supplementary feeding (at least once per day) including type
Health problems	Examination of body including limbs, skin, eyes and respiratory system
Dental abnormalities	Sharp enamel points Calluses and ulcers Wave, shear, smooth and step mouth Overshot and undershot Caries and fractures Diastema and periodontal disease Displaced, worn and supernumerary teeth
Lesions	Location Severity score (0–3)
Halters and harnessing	Material Cleanliness score (0–4) Wear score (0–4)

nesses, halters and other items of saddlery were examined and categorised according to cleanliness, wear and material from which they were made. Cleanliness of harness was graded on a four-point scale ranging from ‘very clean’ (grade 1) to ‘very dirty’ (grade 4), and wear of harness was again graded on a four-point scale ranging from ‘not worn’ (grade 1) to ‘extremely well worn’ (grade 4). All grading and observations were carried out by one person (FB) to prevent bias except for dental examinations and ageing (NDT).

## Statistical analysis

Statistical analysis was carried out using SPSS for Windows version 17.01, 2008 (SPSS Inc., Chicago, IL, USA). Binary logistic regression tests were used for categorical data such as the presence or absence of disease. Kruskal–Wallis or Mann–Whitney tests were used to determine the association between faecal worm egg count (FEC), body condition score, climate, prior treatment, age and sex groups. Risk factor analysis for body lesions was performed. Univariate analysis was undertaken as a screening test prior to performing multivariate analysis using logistic regression methods. Odds ratios and their 95% confidence intervals were calculated for variables; variables with  $P < 0.2$  in the univariate analysis were selected for the multivariable model. A backward stepwise elimination method was employed; variables with  $P > 0.1$  were sequentially removed and the model was rerun until it was finalised. A similar process was carried out to determine risk factors for facial lesions; however, it was not possible to fit all data in to one model due to missing data so model 1 included all variables except bridle material and model 2 included all variables except halter material. In all the analyses, confidence level was held at 95%.

## Results

### Population dynamics

Donkeys from the temperate central states (Queretaro, Morelos, Puebla) made up 45% (98) of the population studied with those residing in the tropical area of Veracruz State accounting for the remaining 55% (118). Donkeys residing in the temperate states (area A) had access to poor-quality, sparse grass; those residing in Veracruz State (area B) mainly had access to lush, plentiful grazing. Of the donkeys studied, 71% (153) of the donkeys had not been treated by the DS–WHW–UNAM teams within the last 12 months whilst the remaining 29% (63) had received treatment.

### Donkey use

Most (93%) of the donkeys examined for this study were working animals with 81% (175) being multi-

purpose, carrying out a variety of agricultural draught, pack and ridden work. Twelve percent (26) of the donkeys studied were employed as draught animals pulling carts at the rubbish dump in Coalco.

#### Body condition score

The body condition scores (BCS) of the donkeys in this study ranged from 1 to 5 (median 2.5). The median BCS for donkeys in area A was 2.5 with the median BCS for donkeys in area B also being 2.5. BCS was not significantly associated with geographical area ( $P=0.90$ ). Poor body condition ( $BCS \leq 2$ ) was only seen in 26% (56) of the population. A Kruskal–Wallis test showed that sex did not affect BCS ( $P=0.24$ ). Young donkeys (0–5 years) had a significantly lower BCS than mature animals (6–20 years) ( $P<0.001$ ) as did older animals ( $\geq 21$  years old) ( $P<0.001$ ).

#### Feeding practises

The majority of the donkeys examined had access to ‘pasture’ at some point during the day. The quality of pasture varied enormously with donkeys in area A having access to primarily poor-quality, sparse grazing (98); most donkeys in area B had access to lush green pasture (118). BCS was not significantly different between the two areas ( $P=0.90$ ). Seventy-seven percent (166) of the donkeys studied received some form of supplementary feeding; as described previously, the provision of any kind of supplementary feed did not have a significant effect on BCS ( $P=0.345$ ). The median BCS for donkeys receiving any kind of supplementary feed in both regions was 2.5 and the BCS for donkeys not receiving supplementary feed was 3; this difference was not found to be statistically significant ( $P=0.35$ ). The most common supplementary feed was whole maize, with 44% (94) of all donkeys receiving this, 35% (76) of donkeys received maize stover, 14% (30) received alfalfa, 6% (12) bran and 12.5% of donkeys (27) received other feedstuffs including oats, sorghum and tortillas. A Kruskal–Wallis test indicated that feed type affected BCS ( $P=0.010$ ). Further analysis indicated that the differences were due to the feeding of alfalfa being associated with a higher BCS ( $P=0.016$ ), median=3. Supplemental feeding was not associated with age group ( $P=0.55$ ) and was not associated with dental disease ( $P=0.45$ ).

#### Faecal parasitology

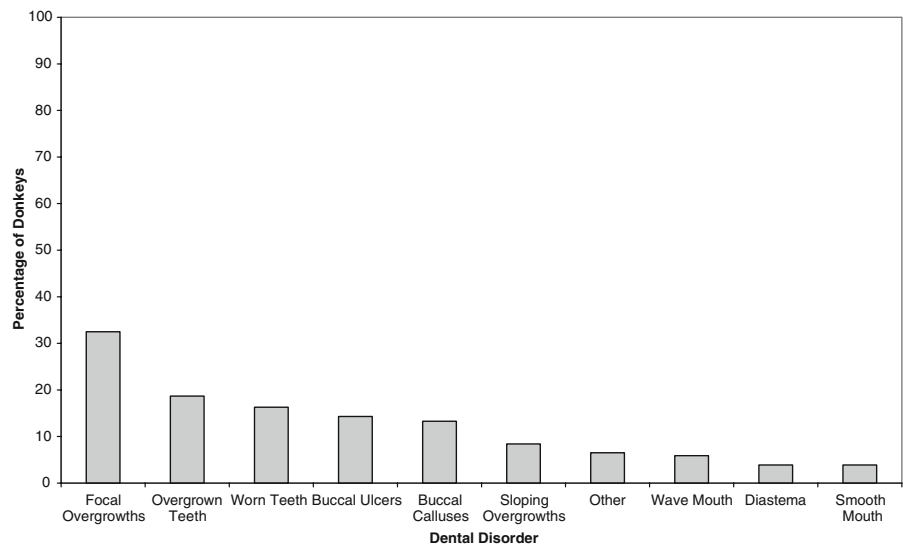
Faecal worm egg counts (FEC) were carried out on samples from 82% (177) of the donkeys studied ( $n=216$ ). FEC ranged from 0 to 5,750 eggs per gramme (epg). The prevalence of donkeys infected with strongyles as indicated by FEC was 80% (141); the median FEC for all donkeys studied was 600 epg. Kruskal–Wallis analysis showed that underweight animals ( $BCS \leq 2$ ) did not have significantly higher FEC ( $P=0.1$ ) than those animals in good to fat BCS ( $BCS 2.5–5$ ). Sex did not significantly influence FEC ( $P=0.21$ ). FECs were found to be significantly higher in area B with a median FEC of 1,000 epg than in area A with a median FEC of 100 epg ( $P<0.001$ ). FEC was significantly lower ( $P=0.009$ ) in locations that had received anthelmintic treatment by DS–WHW–UNAM teams within the last 6 months. FEC were not significantly associated with age group (Table 2) ( $P=0.35$ ).

#### Health problems

Donkeys were examined for overt signs of disease and owners were questioned about the medical history of their animals. The majority of donkeys ( $n=203$ ) also had their teeth examined. The most common health problems observed were dental abnormalities (not including sharp enamel points on the buccal aspect of the maxillary arcade and lingual aspect of the mandibular arcade with no associated ulceration or callous formation), with 61% (126) of the donkeys having a full oral examination suffering from this condition; the prevalence of individual abnormalities are shown in Fig. 1. Skin conditions (including ectoparasites and dermatitis but excluding body lesions) were observed in 12% (25) of the donkeys

**Table 2** Mean values ( $\pm$ SD) of epg of different age groups for strongyles ( $n=177$ )

Age and location	Strongyle FEC (epg)
Young (0–5 years) area A	344 $\pm$ 90
Young (0–5 years) area B	1,710 $\pm$ 279
Adult (6–15 years) area A	314 $\pm$ 82
Adult (6–15 years) area B	1,223 $\pm$ 147
Old (16+years) area A	455 $\pm$ 160
Old (16+years) area B	1,575 $\pm$ 274

**Fig. 1** Prevalence of dental disorders in 203 working donkeys in Mexico

examined. Ocular problems were seen in 3% (7) of the study population, inappetance or weight loss in 3% (7), severe lameness in 2% (5) and respiratory disease and accidental injury seen in just one donkey in each case.

#### Body lesions

Of the 216 donkeys examined, 71% (152) had at least one lesion. The majority of lesions were only minor with 67% (212) being grade 1, 27% (86) grade 2 and only 6% (19) grade 3. The spine (13%), lips (17%) and tongue (33%) had the highest prevalence of grade 3 lesions. Risk factors for the presence of body lesions are described in Table 3. Multivariate analysis suggested that mature donkeys between 6 and 10 years

(OR=2.6;  $P=0.019$ ) and 11–15 years (OR=4.96;  $P=0.030$ ) were more associated with body lesions than older age groups; young (<5 years) and geriatric animals (16+years) were not associated with lesions. Donkeys with dental disease were also associated with lesions (OR=2.08;  $P=0.042$ ); this analysis was carried out as the authors observed that tightly fitting halters appeared to be causing facial lesions and masticatory problems in the donkeys. No significant association was found between gender, BCS, previous treatment by DS–WHW–UNAM, FEC or other health problems and the presence of body lesions.

Lesions of the face were the most commonly observed problem with 54% (116) of the total population having lesions in this area. Multivariate analysis (Table 4) indicated that donkeys wearing

**Table 3** Multivariable logistic regression analysis of risk factors for lesions on the body of donkeys ( $n=216$ ) in Mexico presenting for treatment at DS–WHW–UNAM clinics during May 2008

Variable	Odds ratio	Lower 95% CI	Upper 95% CI	<i>P</i> value
Age				
0–5 years	1.00			
6–10 years	2.60	1.17	5.77	0.019
11–15 years	4.96	1.16	21.12	0.030
Dental disease				
No	1.00			
Yes	2.08	1.03	4.20	0.042
Location				
Morelos	1.00			
Martinica	10.28	1.82	58.16	0.008
Coalco	7.41	1.75	31.43	0.007

**Table 4** Multivariable logistic regression analysis of risk factors for lesions on the head of donkeys ( $n=216$ ) in Mexico presenting for treatment at DS–WHW–UNAM clinics during May 2008

Variable	Odds ratio	Lower 95% CI	Upper 95% CI	<i>P</i> value
Halter material				
Cotton	1.00			
Synthetic rope	4.08	1.62	10.30	0.003
Sex				
Female	1.00			
Stallion	2.47	1.19	5.15	0.016
Gelding	2.5	1.00	6.23	0.048

halters made of nylon rope were associated with facial lesions (OR=4.08;  $P=0.003$ ); other equipment variables were not statistically significant with no association between facial lesions and donkeys wearing bridles made of nylon rope ( $P=0.07$ ). Analysis also indicated that geldings were associated with lesions in the facial area (OR=2.5;  $P=0.048$ ) as were stallions (OR=2.47;  $P=0.016$ ). BCS, age, previous treatment and other health problems were not found to be significantly associated with the presence of facial lesions. The bridge of the nose was the most common site to find lesions with 36% (78) of the donkeys studied having a lesion at this site. Spearman's correlation analysis showed that the wear ( $P=0.36$ ) and cleanliness ( $P=0.28$ ) of the halter that the animal was wearing had no bearing on the severity of these nose bridge lesions.

Table 5 shows all locations of sores and their prevalence in the population studied. Sores that may be associated with a saddle, girths or pads were seen in 20% (43) of donkeys examined, although in 13% (29) of the population the spine area could not be thoroughly examined due to the presence of a saddle. Donkeys with back sores had a lower body condition than those without ( $P<0.001$ ).

## Discussion

This study represents a snapshot view of donkeys presenting for veterinary treatment by DS–WHW–UNAM teams during the dry season in two geographical areas in Mexico. Results show that the population presenting for treatment was mainly male with only 31% of the donkeys studied being female. It is possible that females are not presented for treatment (at DS–WHW–UNAM) as frequently as they may be used for breeding rather than work and may not be

perceived as being needy of veterinary treatment. Further investigation of this trend and encouragement of owners to bring females for treatment and assessment may be useful in this population.

Donkeys studied were, on the whole, in good bodily condition with a median BCS of 2.5 in both study areas. Although poor body condition ( $BCS \leq 2$ ) was noted in 26% of the population, there was no correlation with parasite burden as demonstrated by FEC or with lack of supplementary feeding. Indeed, supplementary feeding appeared to be relatively well managed by owners and the lack of a difference in BCS between those with and without supplementary feeding would suggest that owners are skilful at assessing when a donkey requires more feed or that donkeys are able to maintain body condition by grazing alone. Unfortunately, it was impossible to assess quantities of feed available to donkeys—only to determine types of feed given; this allowed little quantitative assessment of feeding practises to be carried out. When analysed, only supplementation of the diet with alfalfa led to donkeys having a significantly improved BCS. Alfalfa is particularly high in protein and calories and is routinely used in some countries as a supplementary feed for working donkeys; however, it is only available in certain regions of Mexico and it is doubtful that the practise of feeding and growing this legume would be sustainable in many of the areas studied.

Of the donkeys studied, the majority (80%) had a detectable strongyle burden as indicated by FEC. The median FEC for all areas was 600 epg; median FEC was considerably lower in the temperate areas studied (100 epg) when compared with those observed in the tropical region of Veracruz (1,000 epg). These results were similar to the FEC data reported by Valdez-Cruz et al. in 2006 in the area of Veracruz where mean FEC was 588 epg. Other studies have also shown that

**Table 5** Prevalence of lesions and lesion scores seen on working donkeys ( $n=216$ ) presented for veterinary treatment in two rural areas of Mexico

Location	Score 0	Score 1	Score 2	Score 3	Unknown	Prevalence
Bridge of nose	139	58% (45)	38% (29)	4% (3)	N/A	36% (77)
Eye orbit	205	82% (9)	9% (1)	9% (1)	N/A	5% (11)
Ears	215	0	100% (1)	0	N/A	0.5% (1)
Poll	212	50% (2)	50% (2)	0	N/A	2% (4)
Lips	192	54% (13)	29% (7)	17% (4)	N/A	11% (24)
Tongue	213	33% (1)	33% (1)	33% (1)	N/A	1% (3)
Cheek	185	77% (24)	19% (6)	4% (1)	N/A	14% (31)
Chin groove	189	52% (14)	37% (10)	11% (3)	N/A	13% (27)
Spine	156	77% (24)	10% (3)	13% (4)	29	17% (31)
Girth	195	65% (13)	35% (7)	5% (1)	N/A	10% (21)
Elbow	215	100% (1)	0	0	N/A	0.5% (1)
Neck	207	56% (5)	44% (4)	0	N/A	4% (9)
Thigh	203	67% (8)	25% (3)	8% (1)	N/A	6% (12)
Flank/ribs	202	86% (12)	14% (2)	0	N/A	7% (14)
Pelvis	194	86% (19)	14% (3)	0	N/A	10% (22)
Shoulder/chest	199	76% (13)	24% (4)	0	N/A	8% (17)
Tail	210	83% (5)	17% (1)	0	N/A	3% (6)
Legs	210	67% (4)	33% (2)	0	N/A	3% (6)
Total	N/A	67% (212)	27% (86)	6% (19)	29	

animals in tropical areas are likely to have a higher parasite burden than counterparts in areas of lower rainfall (Getachew et al. 2008; Krecke and Guthrie 1999; Kaufmann and Pfister 1990) Such information is of great importance when designing intervention strategies for specific regions. Although previous treatment has led to a significantly lower FEC in some areas and hence lowered contamination of grazing sites, this could be reduced even more using targeted de-worming approaches.

Interestingly, high parasite burdens have been reported as having a negative impact upon BCS in working donkeys (Matthee et al. 2002; Soulsby et al. 2004; Yoseph et al. 2005) and indeed the main reason for carrying out de-worming clinics is often in an effort to improve the BCS of donkeys in a geographical area and subsequently their ability to work. Although FEC is not always a reliable indicator of parasite burden, it is as yet the only practical method of assessing parasite burden in live animals. Based on the results of this study, it would appear that although the majority of donkeys in the areas studied may have a detectable parasite burden, there are other important factors contributing to their BCS. This study is in agreement with other recent studies on working donkeys that report no correlation between parasite

burden as demonstrated by FEC and BCS (Valdez-Cruz et al. 2006; Crane et al. 2008) and may call in to question the validity of de-worming programmes for working donkeys in these areas when solely carried out to increase BCS.

When donkeys were examined for illness, the most commonly observed problems were dental disease and body lesions. Dental disease was common with 61% of the donkeys examined having dental disease including 18% having significant problems such as diastemata, worn teeth, missing teeth and overgrown teeth; the findings of this study are presented in Du Toit et al. (2008) and suggest that these donkeys had clinically significant disease that may have impacted upon the donkey's welfare. The results of this study again agree with previous studies of working donkeys (Fernando-Martinez et al. 2006; Valdez-Cruz et al. 2006) that demonstrated dental disease was prevalent and of concern in Mexican working donkeys. Whilst donkeys were only examined for readily apparent disease, the low frequency of other problems such as lameness, eye disease, skin disease (except lesions), respiratory disease and accidental trauma may be surprising in the context of earlier studies where high levels of malnourishment and lameness are reported (de Aluja and Lopez 1991). It is possible that over the

last 17 years the welfare of working donkeys has improved through the work of charities such as the Donkey Sanctuary and the education of owners, vets and the general public in veterinary and welfare topics. This study suggests that donkeys in the regions of Mexico studied are generally in good health and that owners are skilled in donkey husbandry, management and use.

Body lesions were a significant problem in this study population, with 71% of donkeys having at least one lesion. Analysis showed that mature animals (6–15 years old) were associated with lesions; this is unsurprising as these animals tend to be worked the most frequently and the hardest. The face and back were the regions most commonly affected by lesions; these areas have also been identified by other studies (Pritchard et al. 2005; Nawaz et al. 2006) as common sites of injury. Lesions of the facial region were most common in this population of donkeys and were shown to be associated with halters made of nylon rope. Many of these halters are left on for extended periods of time or are simply never removed and may cause trauma to the skin and deeper tissues. Traditional cotton halters appear more suitable for donkeys in this region and did not put animals at an increased risk of lesions in the facial region. In contrast to other studies, the cleanliness and wear of the halters were analysed, and it was shown that dirtier or well-worn halters were not correlated with more severe lesions. In contrast, Burn et al. (2008) carried out a study in Jordan to assess strap-related lesions in working donkeys; this study established that lesions were worse when straps were dirty and also showed that cotton harness straps were associated with worse lesions in the rump area than synthetic materials. The results of these studies demonstrate that the evaluation of individual circumstances is essential to devise an intervention strategy appropriate to the local customs and environment. It would appear from this study that an intervention study looking at replacement of synthetic halters with more traditional cotton halters would be useful and may lead to an improvement in the welfare of local donkeys.

Spinal lesions were common in the study population (17%) and in 13% of cases were deep lesions liable to lead to severe pain. The results of this study agreed with others that have shown that those donkeys that are underweight are significantly more likely to suffer from severe lesions of the spine

(Pritchard et al. 2005). Spinal lesions were more common in this population than in working donkeys from some areas that have been studied. For example, a study by Pritchard et al. (2005) reported only 7.5% of donkeys suffering from lesions of the spinal area in five countries studied, whereas a later study by Gebreab and Fanta (2006) in Ethiopia reported a similar prevalence to this current study of spinal lesions of 18% in donkeys examined by DS veterinary teams. Lesions of the spine may impact upon the ability of an animal to work and are undoubtedly painful to the animal particularly when loads are to be carried. A strategy which improved BCS score may be likely to improve the incidence of spinal lesions but undoubtedly more research is needed to assess saddle and harness making needs within the area.

## Conclusions

This study has shown that in the majority of cases donkeys studied were in good body condition. Analysis showed that BCS was not found to correlate with FEC or dental disease as is often thought and that in fact other factors may be more pertinent. Lesions of the body and face were frequently seen in this population of donkeys and it appears that age and existing health conditions are the key variables for body lesions with gender and halter materials being the key variables for facial lesions. Dental disease was common in this population and may lead to poor welfare in those cases with the worst disease. Opportunities for revised intervention strategies in these regions are apparent; concentration upon donkey use and husbandry is key to developing successful intervention strategies in this donkey population.

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