

GENERAL ARTICLE

Comparison of working equid welfare across three regions of Mexico

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Abstract

Background: Factors affecting working equid welfare are wide-ranging and reflect cultural, economic and climatic conditions, the type of work equids are used for, and individual differences in the practices of their handlers. In Mexico working equids are widely used for facilitating agricultural activities, however, welfare issues are common.

Objectives: To assess working equids across three communities in Mexico, identify predominant welfare problems and document how these problems vary across locations, associated working roles and species type.

Study design: Cross-sectional survey.

Methods: The study combined the administration of a wide-ranging questionnaire to equid handlers/owners and a welfare assessment of their animal. 120 equid owners were asked about their equid management practices, the working conditions and health status of their animal. The welfare of their equids (56 donkeys, 7 mules, 57 horses) was assessed by evaluating body condition, signs of illness or injury and behavioural indicators.

Results: Welfare varied by species, working role, sex and location. The poorest welfare was seen in one of the two arid regions (the third location having a tropical climate). Donkeys had poorer welfare than horses, and equids used for packing had poorer welfare than those used for riding and agroforestry. Overall poor body condition and wounds were the most common problems seen.

Main limitations: Work type, species type and location strongly co-varied, thus the impact of each factor could not be assessed in isolation. The sample size was relatively small.

Conclusions: Results showed significant regional variations in welfare, suggesting that environmental and/or cultural variations are producing a major effect on welfare.

KEYWORDS

horse, animal welfare, welfare assessment, EARS tool, donkey, mule

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1 | INTRODUCTION

There are almost 100 million working equids in low-middle income countries (LMICs), where they provide income and essential support for their owners.¹ Working equids are most frequently used for draught and packing work but also for riding, ploughing, tourism and domestic tasks.² Working equids are owned by some of the poorest members of society and are of particular importance to marginalised and vulnerable groups.³ As a consequence of socioeconomic factors, owners are often unable to afford adequate working equipment, veterinary care and feed.² Equids are also often working in hazardous terrain and extreme climates⁴ and so despite their importance, global standards of welfare are low.⁵ A study from nine LMICs found 90% of equids suffering from hoof and limb problems and 85% were underweight.⁶ Lameness, poor body condition, wounds, disease, parasites and dental problems are commonly reported.^{6,7} The work of non-governmental organisations (NGOs) and researchers highlighting the welfare issues for working equids globally has led to the development of a range of welfare assessments. In order for these welfare assessments to be directly comparable across a wide range of contexts and conditions, a comprehensive tool utilising a variety of validated welfare indicators and assessments of welfare predictors should be used.

Mexico is currently classified by the World Bank as an upper-middle income country⁸ and contains an estimated 12.9 million working equids.⁹ These working equids are fundamental to agriculture and rural livelihoods,¹⁰ and are often found in the poorer regions of the country. There is a heavy reliance on subsistence farming¹¹ and in the hills of central Mexico, 90% of households rely on draught animals for agricultural production¹² and over 50% of rural households keep a donkey.¹³ Donkeys are still widely used due to their versatility, even as numbers of larger equids such as mules are declining.¹⁰ Donkeys are particularly important in communities with high levels of male economic migration (leaving women working alone for extended periods of time) as they assist women in transport, carrying goods and domestic tasks. Working equids in Mexico face the same welfare challenges seen in LMICs worldwide, including poor body condition, wounds, lameness, overloading, badly fitting or inappropriate harnesses and working equipment.¹¹ The nature of the equid welfare problems seen in communities across Mexico is also affected by the climate and terrain, with tropical areas being more associated with the development of dermal disorders and arid locations being associated with poor forage availability.¹¹ The aim of this study was to assess the welfare of working equids in three states of Mexico and to identify the predominant welfare problems present in these communities to inform the direction of future welfare initiatives.

2 | METHODS

2.1 | Study locations

Welfare assessments were carried out in three states of Mexico: Querétaro, Puebla and Veracruz, between January and April 2019.

Climatic conditions in the three regions vary widely; based upon the Köppen Climate Classification,¹⁴ Querétaro is classified as having a hot, semi-arid steppe climate, usually found on the periphery of true deserts in low-latitude regions. Puebla has a subtropical highland variety of the oceanic climate, typically found in mountainous locations. Veracruz has a tropical, savanna climate where high humidity and rainfall result in higher quality forage in comparison to the other, more arid, locations.

2.2 | Materials

The welfare of the animals and the conditions under which they were managed was assessed using relevant sections of the Equid Assessment Research and Scoping (EARS) tool,¹⁵ developed by The Donkey Sanctuary, a UK-based charitable organisation, to assess working equid welfare under any conditions and context, allowing standardised comparison between communities, regions, countries or ecosystems. This tool contains a wide range of questions for owners regarding the management and working conditions of the equid (see Table S1 and Ref. 15) as well as a behavioural assessment. The full EARS tool contains questions applicable to a wide range of contexts in which working equids are found and so relevant questions to this particular context were selected for inclusion in the protocol used, for example sections on transportation and end of life care were excluded. Once complete, the questionnaire was put into Open Data Kit (ODK) Collect software¹⁶ on an android tablet to facilitate data collection in the field. Assessment results were available to download as excel files.

2.3 | Methods

The researcher (E.H.), who had been consistency checked with other trained assessors, accompanied veterinarians and veterinary students from the Donkey Sanctuary Mexico and the National Autonomous University of Mexico (UNAM) during clinical work in equid owning local communities. Due to logistical and time constraints a majority opportunity sample was used to gather the maximum possible sample size. Animals assessed were from a range of situations including free clinics, routine surgeries on healthy animals, on the spot health checks and random door to door sampling in animal owning communities. Working equid owners were approached and interviewed by the researcher (E.H.) and a translator who was a fluent native speaker and translated directly during the interview. For owners who had multiple equids, one equid per owner was chosen by random number selection to take part in the assessment. For the first part of the interview the owner was asked to hold their equid while a short behavioural and physical assessment was carried out. The welfare markers (for assessment criteria and descriptors see Tables S2 and S3): general health status (3 point scale from poor to good based on cumulative analysis of welfare markers), skin alterations (3 point scale from poor to good based on

cumulative analysis of skin alterations), body condition score (5 point scale), presence of parasites (presence or absence of listed parasite types), lameness (3 point scale from unable to walk to no signs of lameness based on observed movement) and reaction to observer approach (friendly, neutral, avoidant, aggressive), were recorded by the researcher. Subsequently, owners were asked a verbal questionnaire covering their working practices, general equid management practices, protection from the elements provided, attitudes towards working equids and demographic and livelihood factors. Interviews were audio-recorded for subsequent verbatim transcription of open questions. Interviews typically lasted between 20 and 40 minutes.

2.4 | Data analysis

Descriptive statistics were calculated for the population. A series of Mann-Whitney and Kruskal-Wallis tests (with post hoc pairwise comparisons adjusted for multiple testing) were used to assess differences in welfare markers (body condition score, skin alteration score and general health score) based on the equid species, sex, age (grouped in to 0-5, 6-10, 11+ years), primary role and location.¹⁷ For statistical assessment of the relationship between working role and welfare markers and income indicators, only the three main roles observed (riding, packing, and agroforestry) were included. Twelve subjects that had other roles, including tourism, breeding, pet, transport of goods by cart, and onward sale, were not included in the analyses. Due to the small sample size of mules ($N = 7$), they were excluded from analyses of species effects and only direct comparisons between donkeys and horses were made. Chi-square tests ($3\chi^2$ and $2\chi^2$) were used to assess whether the role of the equid (riding/packing/agroforestry) or the species (donkey/horse) influenced the likelihood that the equids were the primary source of income and whether the owners were able to save money (Yes/No categories). For analysis of reaction to observer approach, the categories 'moved head away from assessor', 'moved whole body away from assessor' and 'showed aggressive behaviour' were grouped together as negative reactions and were analysed against the positive reaction 'friendly approach' and the neutral reaction 'did not move'. For analysis of skin alterations, open wounds and large scars or scars with a known cause other than accidents (ie tack wounds or beating scars) were classified together as serious skin alterations, alopecia and small scars or scars resulting from accidents were classified as less serious skin alterations. Analyses were performed using SPSS (SPSS Inc.) (version 24.0). The raw data for this study,¹⁸ including additional information regarding management practices outside of the working period (including details of housing and bedding provision, and water access) are available.

3 | RESULTS

A total of 120 adult owners or handlers participated, women ($n = 25$), men ($n = 95$) with ages ranging between 16 and 84 (mean = 47.9,

SD = 16.2 years). Participants were interviewed from 13 villages in the states of Querétaro ($n = 60$), Puebla ($n = 39$) and Veracruz ($n = 21$). The majority of participants 71.2% ($n = 89$) described themselves as farmers although often in conjunction with another job. A total of 56 donkeys (females = 17, stallions = 29, geldings = 10), 7 mules (females = 2, stallions = 2, geldings = 3) and 57 horses (females = 21, stallions = 20, geldings = 16) were assessed. The mean age of the equids (excluding 4 whose ages were unknown) was 8.36 years (range = 1-33, SD = 5.7 years).

3.1 | Working conditions

The primary roles of the equids assessed were: riding 39% ($n = 47$), transport by pack 35.8% ($n = 43$), agroforestry 15% ($n = 18$) and other 10.2% ($n = 12$). There was a clear allocation of working role by species with all ($n = 7$) mules used for agroforestry, the majority of donkeys 75% ($n = 42$) used for carrying goods by pack and the majority of horses 75% ($n = 43$) used for riding. There was also a difference in the primary roles of the equids according to location. In Querétaro, participants were recruited from villages and towns in rural mountainous areas where equids were used for a mixture of roles including riding 50% ($n = 30$), agroforestry 23% ($n = 14$), and carrying goods by pack 12% ($n = 7$). In Puebla, participants were interviewed from a dry, arid area where donkeys are mainly used for carrying goods for the household by pack 84% ($n = 33$), such as firewood and maize. In Veracruz, participants were interviewed from villages predominantly using horses to herd and tend to cattle 76% ($n = 16$).

The majority 91% ($n = 109$) of owners indicated that their equid provided some form of income; although of those, only 22% ($n = 24$) said that their equid was their main source of income, with 8% ($n = 9$) of owners also having a permanent salaried job. A significant difference in whether an equid was an owner's main source of income was found according to primary work type, ($n = 108$, $P = .04$). Only 5% ($n = 2$) of packing equids compared to 30% ($n = 14$) of riding equids and 6 of 18 agroforestry equids were described as a main source of income. There was no significant difference in owner ability to save money according to species ($N = 113$, $P = .5$).

Working hours were variable, 42% ($n = 50$) of equids worked 3-6 hours per day, 41% ($n = 49$) worked less than 3 hours per day, only 15% ($n = 18$) worked more than 6 hours per day and the work hours of 2.5% ($n = 3$) of equids were unknown. Some equids 23% ($n = 28$) worked 7 days a week, few 5% ($n = 6$) worked 6 days a week and the remaining equids 72% ($n = 86$) worked 5 days or less per week. Mules worked the longest hours, working 6-9 hours per day was common (3 of 7 mules) but uncommon for horses 13% ($n = 7$) or donkeys 12% ($n = 7$). Mules also worked the highest number of days per week; 4 of 7 mules worked 7 days a week compared to only 23% ($n = 13$) of donkeys and 19% ($n = 11$) of horses. However, 5 of 7 mules worked only seasonally compared to 32% ($n = 18$) of donkeys and 25% ($n = 14$) of horses. According to owners, 48% ($n = 58$) of equids had a rest break during the working day with their load

removed and 28% ($n = 34$) had a break but with their load left on, remaining equids did not carry loads. During this resting time only 6% ($n = 7$) of equids had free access to shade although 60% ($n = 72$) had limited access to shade. During the working period 59% ($n = 71$) of equids had no access to water. Pasture was the main constituent of the diet in 88% ($n = 106$) of equids, often alongside additions such as maize stalks, corn grain, alfalfa and occasionally a commercial mix. Feeding frequency varied, 49% ($n = 59$) of equids were fed once or twice a day, 20% ($n = 24$) 3-4 times a day, 2% ($n = 2$) 5-6 times a day and the remainder left to graze ad libitum when they were not working, however 53% ($n = 64$) of equids never had access to grazing. Only one owner reported hobbling their equid and 48% of owners ($n = 58$) reported tethering their equids by the neck.

3.2 | Physical welfare parameters

3.2.1 | Body condition score

Overall, 2% ($n = 3$) of equids were found to be very thin, 36% ($n = 43$) were thin to moderate, 50% ($n = 60$) were ideal and 12% ($n = 14$) were fat. There was no difference between donkeys and horses

($P = .09$, Figure 1A). There were significant differences in body condition score based on location ($P < .001$), with lower body condition scores seen in Puebla in comparison to both Queretaro ($P = .002$) and Veracruz ($P = .002$), but no difference between Queretaro and Veracruz ($P > .99$) (Figure 1B). Body condition scores also differed significantly according to primary work type ($P = .03$), with better body condition scores seen in riding equids in comparison to pack equids ($P = .05$) but no difference between those used for agroforestry and riding ($P > .99$) nor packing ($P = .1$) (Figure 1C). Body condition scores across sexes were not significantly different ($P = .06$) and there was no difference in the body condition scores of equids across different age groups ($P = .5$).

3.2.2 | General health status

Overall, 63% ($n = 76$) of equids were classified as being in good health, 29% ($n = 35$) were in fair health and 8% ($n = 9$) in poor health. Donkeys had poorer general health in comparison to horses ($P < .001$, Figure 1A). There were also significant differences between the general health status of equids in the different locations ($P < .001$), with poorer health seen in the state of Puebla in comparison to

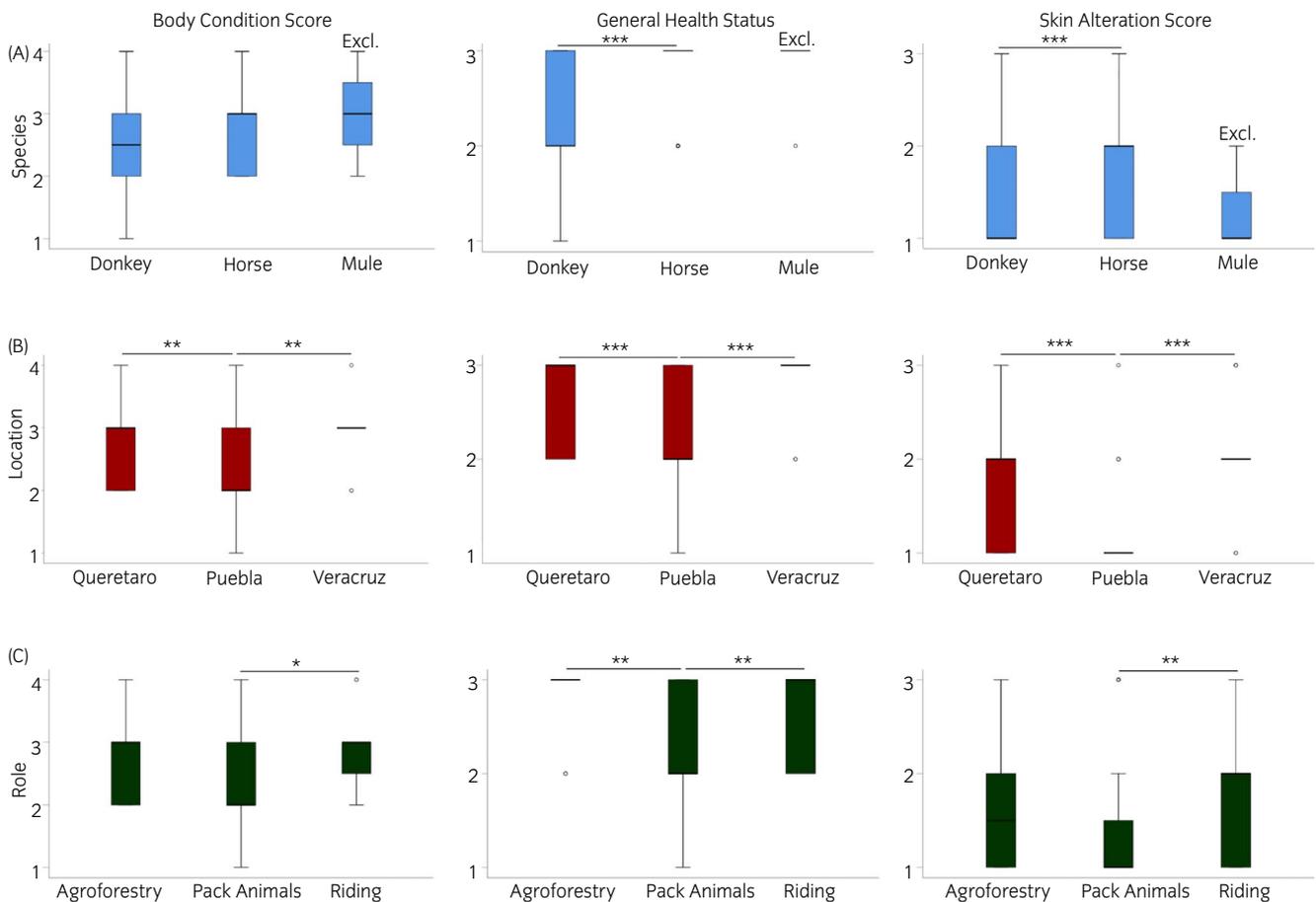


FIGURE 1 Boxplots showing the distribution of Body Condition Scores, General Health Status Scores and Skin Alteration Scores across (A) Species (B) Location (C) Working Role. Due to the small number of mules sampled, these were excluded from species-level analyses. * $\leq .05$, ** $\leq .01$, *** $\leq .001$

both Queretaro ($P < .001$) and Veracruz ($P < .001$), but no difference between Queretaro and Veracruz ($P > .99$) (Figure 1B). General health status also differed significantly according to primary work type: agroforestry, packing or riding, ($P = .001$). Pack animals had the worst general health status in comparison to both riding animals ($P = .004$) and those used for agroforestry ($P = .01$), but there was no difference between those used for riding and agroforestry ($P > .99$, Figure 1C). General health status also differed significantly by sex: female, entire male or castrated male, ($P = .01$), with a higher number of castrated males in good health compared to females ($P = .008$) but no difference between entire males and females ($P = .37$) nor castrated males ($P = .23$) (Figure S1A). There was no difference in the general health status of equids across different age groups ($P = .2$).

3.2.3 | Skin alterations

In the skin system assessment 84% ($n = 101$) of equids showed some type of skin alteration, 16% ($n = 19$) had open wounds, 63% ($n = 76$) had scars, 44% ($n = 53$) had alopecia, 2% ($n = 2$) had swellings, 8% ($n = 10$) had a hot brand, 8% ($n = 10$) showed signs of limb tethering or hobbling, 3% ($n = 4$) show signs of live serreta (abrasive metallic pieces) or metallic chains in the noseband or chinstrap regions, 6% ($n = 7$) showed signs of ear cutting and 13% ($n = 16$) were classified as having other problems (mainly hoof issues such as overgrown or cracked hooves). Visual signs of lameness were observed in 15% ($n = 6$) of equids when walked by their owner. The main cause of skin alterations (including both recent and visible old injuries) was tack (saddle, girth and bridle or noseband), comprising 49% of all skin alterations assessed. Donkeys had more serious skin alterations in comparison to horses ($P = .001$) (Figure 1A). There were also significant differences in skin alterations based on location ($P < .001$), with more serious skin alterations seen in Puebla in comparison to both Queretaro ($P = .001$) and Veracruz ($P = .001$), but no difference between Queretaro and Veracruz ($P = .1$) (Figure 1B). Skin alterations also differed significantly according to primary work type ($P = .003$), with significantly more serious skin alterations seen in packing animals in comparison to riding animals ($P = .002$) but no difference between those used for agroforestry and riding ($P > .99$) nor packing ($P = .3$, Figure 1C). There was no difference in the degree of skin alterations between sexes ($P = .5$). There was a significant difference in the skin alteration scores of equids across different age groups ($P = .01$), with more serious skin alterations seen in oldest animals in comparison to youngest animals ($P = .01$) but no difference between and oldest animals and medium age animals ($P = .1$), nor between medium age and young animals ($P = .8$) (Figure S1B).

3.3 | Behavioural parameters

Overall responses to observer approach by equids were: friendly 58% ($n = 70$), neutral 8% ($n = 10$) and negative 34% ($n = 40$). When split by species, mules showed the highest proportion of negative

reactions 4 of 7 mules, in comparison to 29% ($n = 16$) of donkeys and 35% ($n = 20$) of horses. Overall responses to the observer walking down the side of the equids were 42.5% ($n = 51$) positive, 40% ($n = 48$) neutral and 17.5% ($n = 21$) negative. However, when split by species mules reacted more negatively, 3 of 7 mules when compared to donkeys (20%, $n = 11$) and horses (12%, $n = 7$). A tail tuck (a sign of fear in donkeys and mules) was only observed in 4% ($n = 5$) of animals. 73% ($n = 88$) of equids accepted chin contact, the remaining 27% ($n = 32$) did not. Signs of heat stress were only observed in one horse. Flies were the most common parasite observed (present on 36%, $n = 43$, of equids) and behavioural signs of insect nuisance observed during a 60 second period ranged from 0 to 33 behaviours.

4 | DISCUSSION

Overall poor body condition and wounds were the most common problems seen across the three states. In comparison to results from welfare assessments of equids across nine LMICs,⁶ the equids in Mexico had a slightly higher mean body condition score (2.71) than the average across the other countries (2.14), and displayed a similar percentage of broken skin/lesions (16%) in comparison to an average of 20% across the other nine countries. Although hoof problems were observed, levels of lameness were much lower than in other studies where lameness has been as high as 100%,⁶ suggesting that lameness is not a prevalent welfare issue in these regions however a more in depth lameness examination would be needed to confirm this. Welfare (measured by body condition score, general health status and skin alteration score) differed by species, location, role and sex. Donkeys, mares, animals used for packing, and animals in the state of Puebla (which has an arid climate) tended to have the worst welfare when compared to other groups.

The differences in welfare across location suggest that environmental, climatic and/or cultural variations (such as differences in handling and perspectives of owners and general husbandry practices) across regions in Mexico are having a large impact on welfare. Different climates are linked to the development of different welfare issues¹⁹ with more tropical climates increasing insect challenge and parasite burdens such as parasitic dermatitis, the second most frequent cause of cutaneous lesions found in one Mexican study.²⁰ Areas with higher rainfall may also pose a problem for donkeys who are less able to tolerate wet environments without shelter.²¹ The relative importance of factors such as access to shade may also depend upon climatic conditions experienced such as humidity and solar radiation. Interestingly, the worst welfare in this study was not found in Veracruz (high humidity and rainfall), instead in Puebla, which has a more arid environment, suggesting that lack of, or poor quality forage may be the key environmental problem. Although not the financially poorest area according to local colleagues (due to the high level of male migration from this area to the US) the area is isolated and has been identified as having social problems. Husbandry and handling practices in the study areas were learned mainly through family

and traditional knowledge. This creates pockets of practices that are very localised, hence general welfare and husbandry practices can vary widely by location based on cultural differences. Future research exploring the relative effect of culture and owner perspectives vs environmental factors in more depth would be beneficial in understanding the impact that these may have on equid welfare.

Our study identified clearly defined relationships between species of equid and primary work type, with donkeys being primarily used for packing, mules for agroforestry and horses for riding in agreement with previous research.²² The number and type of skin alterations has previously been linked to work type.²⁰ Our results support this; we found that packing equids had significantly more serious skin alterations than equids used for riding and agroforestry. Equids that are used for packing are often overloaded, with their burdens unevenly distributed.²³ This can cause lesions, especially on the (thoracolumbar region of the) spine²⁴ and wounds along the spine were observed most frequently in areas where equids were used for packing in our study. Plastic sheeting was commonly used underneath saddles in our study locations. The material used underneath the saddle or frame can have a large impact on the formation of wounds in the thoracolumbar region, with plastic or burlap associated with friction and saddle sores.²⁵ Although the relationship between skin alterations and body condition score was not significant, poor body condition can predispose equids to the formation of wounds due to friction with more prominent bones and less body fat as protection.²⁰

All welfare indicators in this study were worse for donkeys in comparison to horses. The sample size of mules was too small for statistical comparison but the limited findings here suggest their welfare was comparable to horses for body condition score and general health status but lower for the skin alteration score. However, the majority of mules were examined outside the typical working season suggesting their body condition could be poorer at other times of the year. Poorer body condition in donkeys than mules and horses has been documented across a number of LMICs.⁶ A longer study conducted across seasons would benefit understanding of seasonal impacts upon welfare such as peaks in physical workload and forage availability, and how this can be linked to location and climatic factors. As well as the differences in work type, this may be due to the fact that mules and horses are considered more valuable because they fetch a higher price at sale. Mules are prized for their strength which is harnessed in agriculture and are preferred over and above horses and donkeys for this 'heavy work' such as ploughing, despite their reputation of being temperamentally harder to work with. Negative reactions are particularly seen in response to unfamiliar individuals and have been associated with handling methods.^{26,27} Mules are increasing in value as they are becoming more rare and the ability to hire them for agriculture has been highlighted as an important source of income for many owners in Mexico.¹⁰ Due to this, horses and mules may receive higher levels of care, a suggestion made in a study of working equid welfare in another Mexican state.²⁸ Donkeys are associated with the home and domestic tasks and as such may be considered less important than mules and horses who work outside of the home. A

gender differentiation has also been described, with donkeys more frequently used by women in their domestic activities, and men using larger equids such as mules for agricultural activities.¹⁰ Due to the large proportion of their work being within the home, donkeys are less likely to contribute directly to the income of their owners. Only 9% of donkey owners reported that working with their donkey was their primary source of income in comparison to 32% of horse owners. This situation mirrors that seen in policy, where working equids (especially donkeys) are routinely overlooked in higher level agricultural and development policy as their role is difficult to quantify in terms of monetary value.²⁹ They enable people to carry out activities that make money and often provide a huge labour saving but they are not themselves a source of income.³ One hypothesis considered was that poorer owners, who cannot afford veterinary care or sufficient food, may have donkeys but this does not appear to be the case in our study as we found no significant difference between species owned and owner ability to save money.

In this study, the EARS tool successfully enabled standardised comparison between different regions and communities in a Latin American context. Its efficient process and design for use with all equid species allowed rapid assessment of equids across a variety of working roles in the field. However, it should be noted that differences in the distribution of species across location and work type make it difficult to draw any firm conclusions as to the relative importance of work type, species, environmental and cultural factors. Covariance has previously been noted between factors such as environment and working role when looking for predictors of poor welfare.⁶ Across locations, species tend to have clearly defined work roles according to their physical and behavioural attributes. A study across five countries found horses and donkeys were used for both packing and riding however mules were solely used as draught animals.² Types of work naturally co-vary with environmental factors, with climatic conditions influencing the types of work that are productive or available within a region. Across nine developing countries riding and agricultural work was more common in rural areas with urban animals more likely to be used to pull carts.⁶ Links between welfare status and work type appear to be particularly strong with the transport of goods by pack one of the specific roles associated with an increased number of welfare problems across species,⁶ as was found in this study. Within species the relationship has also been shown to impact upon welfare with packing donkeys more likely to be thin compared with draught and ridden donkeys.² The small sample size of animals in our study (particularly mules) limits the generalisability of results to other contexts. While species, work type and location tend to naturally co-vary, an extensive randomised study across a wider range of locations and cultures may identify instances where equids are found in unusual roles, allowing analyses to more readily isolate the relative effects of these factors.

In conclusion, poor body condition and a high prevalence of skin alterations appear to be the most common welfare issues within the study communities. Body condition score and general health status were affected by species, work type and location, with donkeys, packing equids and those from study communities in

the state of Puebla having the worst welfare. Understanding how the local and wider-level cultural practices, climatic conditions, management practices, working roles and species-specific factors all influence the prevalence and type of welfare problems seen in working equids, will allow for carefully targeted welfare initiatives.

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CONFLICT OF INTEREST

No competing interests have been declared.

AUTHOR CONTRIBUTIONS

The idea for the paper was conceived by L. Proops, F. Burden and E. Haddy. Acquisition of data was organised by F. Burden, Z. Raw, O. Prado-Ortiz and H. Zappi. Data were collected by E. Haddy, O. Prado-Ortiz and H. Zappi. The data were analysed by E. Haddy and L. Proops. The paper was written by E. Haddy, L. Proops, F. Burden, Z. Raw, O. Prado-Ortiz and H. Zappi.

ETHICAL ANIMAL RESEARCH

This research was approved by the University of Portsmouth's Animal Welfare Ethics Research Board and University of Portsmouth's Ethics Committee, reference number: SFEC 2018-121.

OWNER INFORMED CONSENT

All owners and handlers gave informed consent for their animals' inclusion in the study.

DATA ACCESSIBILITY STATEMENT

The data that support the findings are accessible via the Portsmouth Research Portal at <https://doi.org/10.17029/86cb3171-f0c7-45b7-bb39-4958a6663e40>.

PEER REVIEW

The peer review history for this article is available at <https://publons.com/publon/10.1111/evj.13349>.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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