

1 Comparison of the socioeconomic value and welfare of working donkeys in rural and urban
2 Ethiopia

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19

20 **Abstract**

21 Donkeys are widely used throughout Ethiopia and play essential roles in a variety of
22 everyday and income generating tasks for the people that use them. The challenges faced by
23 people and their working equids vary across communities and geographic locations. This may
24 have implications for how donkeys are perceived by the people they work for, the roles they
25 fulfil and ultimately their welfare. Two complementary methodological approaches were
26 used in this study to explore the socioeconomic value of donkeys for their owners and the
27 welfare of the donkeys in rural and urban Ethiopia. Using a questionnaire, donkey owners
28 were asked about their donkeys, their attitudes and beliefs related to donkey use and
29 ownership, and the role donkeys played in their lives. Animal-based welfare assessments
30 were also conducted on a sample of donkeys from different locations, with the overarching
31 aim of the study to investigate differences in use, beliefs, and donkey welfare between rural
32 and urban locations. In both rural and urban locations, working donkeys are critical for their
33 owners' income-generating activity and therefore their livelihoods. The work they undertake
34 differs substantially between locations, as does their welfare. Work in each setting presents
35 its own challenges and these are reflected in the behaviour and physical health of the
36 donkeys. Rural donkeys showed more apathetic behaviour, a higher ectoparasites burden and
37 greater evidence of tethering/hobbling. Urban donkeys were more alert and had a wider range
38 of body condition scores. The findings highlight marked differences in the role and welfare of
39 donkeys between different areas within the same country, demonstrating the importance of
40 understanding the context from both the human and working equids perspective before
41 staging interventions intended to benefit either party.

42

43 **Keywords:** attitudes, behaviour, donkey, questionnaire, welfare assessment, working equids

44

45 **Introduction**

46 Throughout the world, working equids provide a critical resource for some of the poorest and
47 most marginalised people, enabling them to travel to access resources such as schools and
48 healthcare, and to generate income to support themselves and their dependents. However,
49 despite their importance, working equids are frequently overlooked in agricultural and
50 economic initiatives (Frohlich 2020, Pritchard et al 2018) and little is done by policy makers
51 to safeguard working equids' welfare.

52 Donkeys are widely used in rural, urban and peri-urban regions of Ethiopia and play essential
53 roles in a variety of everyday and income generating tasks (Geiger et al 2020, Stringer et al
54 2011). While many of the people who are reliant on donkeys exist on very little income
55 (Kubasiewicz et al 2020), people without access to a donkey are economically even worse off
56 (Stringer et al 2011). Despite their significant contribution to the livelihoods of many
57 Ethiopian people, donkeys themselves are not perceived as high-status animals. They are
58 often denied access to the kind of feed and healthcare that is made available to other animals
59 and are considered one of the most neglected animals in the country (Martin Curran 2005,
60 Mekuria and Abebe 2010, Stringer 2011, Usman et al 2015).

61 The challenges faced by individuals and their working equids vary across communities and
62 geographic locations; consequently a broad brush, one-size-fits-all approach to addressing
63 welfare issues is unlikely to work even within the same country (Upjohn et al 2014). Recent
64 research has identified a disparity in the perception of donkey welfare between rural and
65 urban areas of Ethiopia; rural donkeys are perceived to have poorer welfare than their urban
66 counterparts (Geiger et al 2020). In contrast, The Brooke (an NGO focusing on improving the
67 welfare of working equids) identified the overloading of pack-donkeys in urban Ethiopia as
68 an ongoing welfare issue where improvement was hard to achieve (Pritchard et al 2018).

69 Rural and urban donkeys live in very different environments, with their own unique
70 challenges, and may undertake different roles for those who own or use them. Consequently,
71 it is likely that while there may be some similarities, the welfare of rural and urban working
72 donkeys are affected in different ways. Demographic challenges in optimising the efficacy of
73 welfare interventions are further compounded by the geographic distribution of the different
74 welfare concerns; one region may have serious issues with lameness, while another may have
75 high levels of wounds or lesions (Burn et al 2010a); inconsistencies among different
76 indicators are often seen (Upjohn et al 2014).

77 The decisions made by donkey owners and users regarding donkey care and husbandry are
78 increasingly recognised as highly complex, encompassing social conventions and beliefs,
79 access to advice and resources, and individual economic constraints (Upjohn et al 2014,
80 Watson et al 2020). Understanding these factors is important if NGO interventions are to be
81 appropriately targeted, and ultimately effective in improving equine welfare (Pritchard et al
82 2018).

83 In this study, rural and urban donkey owners were asked about their donkeys, their attitudes
84 and beliefs related to donkey use and ownership, and the role their donkeys played in their
85 lives. Animal-based welfare assessments were also conducted on a sample of donkeys from
86 different locations, with the overarching aim of investigating differences in use, beliefs, and
87 donkey welfare between rural and urban locations.

88

89 **Methods**

90 *Ethical approval*

91 The study was approved by the Faculty of Medical and Veterinary Science's Research Ethics
92 Committee, University of Bristol (January 2015 ref: 16721). Additional ethical approval was

93 granted for the welfare assessments by the University of Bristol Animal Welfare and Ethical
94 *Review Board (AWERB).*

95 *Location*

96 During June and July 2015 data were collected from six case study sites, these include three
97 rural Ethiopian communities; Meti, Argeda and Dawe in the Rift Valley in the area of Arsi
98 Negele in the Oromia regional state and three urban sites in and around Addis Ababa; CMC
99 North, Burayo, and Summit 30. The locations selected had not been previously exposed to
100 any equine charity work; this criterion was used in order to limit, as far as possible, the effect
101 of outside influences on the responses of participants.

102

103 *Donkey owner questionnaires*

104 Donkey owner questionnaires (see supplementary material 1) were conducted with working
105 donkey owners in five out of the six case study sites visited. One of the urban areas, Burayo,
106 did not have many donkey owners so questionnaires were not completed in this location. The
107 purpose of the questionnaire was to yield further information regarding the types of income
108 generating tasks donkeys were used for and to find out more about people's beliefs related to
109 donkeys.

110 The questionnaire took approximately 30 to 40 minutes to complete per person and
111 participants were thanked for their time with an in-kind one-kilogram bag of coffee (a
112 customary gift in Ethiopian culture). Data from each questionnaire were entered into an Excel
113 (Microsoft Office) spreadsheet.

114 *Welfare assessment*

115 Donkey welfare assessments were conducted with donkeys in all six locations by two
116 researchers (MG and MGt). Both researchers were trained in the welfare assessment protocol
117 and MGt is a veterinarian with extensive donkey experience. The assessment consisted of
118 animal-based measures (e.g. health and behaviour) rather than resource-based measures (e.g.
119 provision of food and water, condition of harness) (Burn et al 2010b). The assessment was
120 short in duration (10 to 15 minutes) as it was important not to take up too much of the
121 owners' time when they could be working (Burn et al 2010b, Pritchard et al 2005).

122 Donkeys were recruited for welfare assessment through asking participants at a two-day
123 workshop (see Geiger et al paper 2) if the two observers could perform a welfare assessment
124 of their donkeys for research purposes. The data were recorded on printed welfare assessment
125 sheets and were transferred onto an Excel (Microsoft Office) spreadsheet after each site visit
126 (for welfare assessment recording sheet see supplementary material 2).

127 The welfare assessment consisted of 24 observations of health, behaviour and owner
128 handling, with measures derived from previous studies (Burn et al 2010b, Pritchard et al
129 2005). The assessment required only minimal touching of the donkey, with only the right
130 foreleg picked up for examination (Pritchard et al 2005). The measures were categorised into
131 general health parameters, body condition, limb disorders, and lesions of skin and/or deeper
132 tissues. Observations had scores of severity where appropriate or were recorded as being
133 present or absent. Skin lesions were classified on a scale between 0-3; 0 indicating no lesions
134 present; 1 representing superficial or healed lesions with loss of hair, healed scars; 2
135 representing small lesions no larger than the tip of a cotton bud with skin and immediate
136 subcutaneous layers broken; 3 representing deep lesions with subcutaneous layers broken and
137 larger than the tip of a cotton bud.

138 The welfare assessment was field tested for practicality prior to data collection in Ethiopia in
139 March 2015.

140 *Analysis*

141 Raw data from the Excel spreadsheets were transferred to SPSS (IBM v. 24 for Windows)
142 and recoded as necessary for analysis.

143 As the data was not normally distributed, nonparametric statistics were used to compare
144 responses from participants in rural and urban areas. Mann-Whitney U, Chi-square and
145 Fishers Exact tests were used as appropriate. Significance level was set at $P \leq 0.05$.

146 The welfare assessment data were predominantly categorical in nature and consequently also
147 underwent nonparametric analysis using Chi-square or Fishers Exact tests. A post hoc
148 Bonferroni correction was used to reduce the risk of Type I errors given the large number of
149 tests conducted ($n=34$). Consequently, significance was set at $P=0.015$ for the analyses of the
150 welfare assessment data.

151

152 **Results**

153 *Donkey owner questionnaire*

154 The questionnaire was completed by 28 donkey owners, 15 from rural locations and 13 from
155 urban locations (Table 1). Participants from the two locations differed significantly in age
156 distribution ($U=140.50$, $P=0.046$), whether they owned their own house ($\chi^2=17.28$, $P<0.001$)
157 and the number of dependents they had ($U=21.50$, $P<0.001$) with urban participants being
158 older, less likely to own their house and having fewer dependents. There were no female
159 participants from urban locations.

160 [Table 1 here]

161 Participants in urban locations owned more donkeys (mean 3.62, range 1-7) than those in
162 rural locations (mean 2.93, range 1-8), although this difference was not significant ($P>0.05$).

163 Participation in various income-generating activities with and without a donkey varied
164 between rural and urban locations (Figure 1a and b). All of the income-generating activities
165 in rural locations, and nearly all of those in urban locations utilised donkeys, although the
166 specific activity was highly dependent on location. Collection of rubbish and transportation
167 of construction materials were only reported in urban locations.

168 [Figure 1a and 1b here]

169 In rural locations, the most money was spent on donkeys in the dry and the rainy seasons
170 (both 46.67%), with only one participant reporting spending the most on their donkey during
171 harvesting (6.67%). In urban locations, 76.92% of participants reportedly spent the most
172 money on their donkey in the dry season, and 15.38% in the rainy season. It is important to
173 note here that there was no unified agreement between participants, within or between
174 locations, as to whether there were two seasons (rainy and dry) or three (rainy, dry and
175 harvesting).

176 Donkey use by men and women differed significantly between locations ($\chi^2=17.95$, $P\leq 0.001$),
177 with men being the primary users in urban locations (76.92%) and woman the primary users
178 in rural locations (100%). There was also a significant difference between the preferred
179 gender of the donkey in each location ($\chi^2=6.62$, $P=0.010$); male donkeys were preferred in
180 urban settings (100%), while in rural locations 60% of participants said that their community
181 preferred male donkeys and 40% preferred females.

182 In both rural and urban communities, cows were reported as the animals that gave most social
183 status to the owners while chickens gave the least.

184 There were no significant differences between whether rural and urban participants felt
185 owners were justified in hitting their donkeys in the five scenarios presented ($P>0.05$; Figure
186 2a and b). Most participants from both locations felt justified in hitting a donkey that would
187 not move forward.

188 [Figure 2a and 2b here]

189

190 *Welfare assessment*

191 In total, 161 donkeys were assessed across the six study sites: 93 in rural locations and 68 in
192 urban locations. The environmental conditions prevailing during the welfare assessment
193 varied between locations. The weather was hot (21 degrees and above) in two of the three
194 rural locations and mild in the remaining location (20 degrees to 10 degrees). The weather in
195 the urban locations was more variable sometimes changing during an assessment, resulting in
196 29.4% hot, 60.3% mild, 4.4% cold and 5.9% wet weather at the time of the welfare
197 assessment Three of the six data collection sites were based in northern Addis Ababa that is
198 located at high altitude making the temperature more moderate all year around with the
199 northern areas of the city built on the Entoto Hills colder and wetter (10 degrees and below)
200 than the southern parts. South of Addis Ababa in the Rift Valley near city Arsi Negele, was
201 where the rural villages were located where the temperatures were hotter with less rainfall
202 and more humidity.

203 Prior to the assessment commencing, all the rural donkeys had been resting. The majority of
204 those in urban locations were carrying a pack saddle (73.5%) and others were resting (17.6%)
205 or pulling carts (8.8%).

206 All of the donkeys assessed in the urban environments were entire males (stallions); in rural
207 settings 46.2% were entire males and 53.8% were female. None of the donkeys assessed in

208 either location were geldings (castrated males). The age of the donkeys assessed in each
209 location did not differ significantly; 26.9% or 20.6% were under five years of age, 55.9% or
210 48.5% were aged between 5-15 years and 17.2% or 26.5% were aged 16 or over in rural and
211 urban settings respectively.

212 The behaviour of the donkeys and their interaction with their owners significantly differed
213 between rural and urban locations, with the exception of how the donkeys responded to the
214 assessor touching their chin (Tables 2 and 3). More of the urban donkeys were alert in their
215 demeanour but did not move away or show interest in the assessor.

216 [Table 2 here]

217 The body condition score (BCS) of the donkeys differed significantly between locations
218 ($F=45.91$, $P\leq 0.001$), with a greater range in scores seen in urban settings. In rural locations,
219 1.1% had a BCS score of 1, 44.1% were scored 1.5, 49.5% scored 2 and 5.4% scored 2.5. In
220 urban settings, 1.5% scored 1 (there is no 0 BCS), 8.9% scored 1.5, 36.8% scored 2, 36.8%
221 scored 2.5, 14.7% scored 3, 1.5% scored 3.5 and 1.5% had a BCS of 4.

222 The common ectoparasites observed during our assessment were lice, ticks, and bot eggs.
223 Dermatophilosis, mange mites and habronema associated lesions were also common.

224 These ectoparasites were significantly more common in rural donkeys ($F=35.68$, $P\leq 0.001$).

225 The majority of urban donkeys were free from ectoparasites (94.1%), while 4.4% had mild
226 ectoparasite burdens and 1.5% moderate burdens. Only 51.6% of rural donkeys were free
227 from ectoparasites, 25.8% had mild burdens, 16.1% had moderate burdens and 6.5% had
228 severe ectoparasite burdens. Severe ectoparasite burdens were characterised as highly visible
229 infestations with many more than ten visible parasites. Moderate burdens were characterised
230 by having ten to five visible parasites and mild burdens were one to five.

231 All areas of the donkey were assessed for the presence and severity of lesions (Table 3).
232 While donkeys in each location did not differ significantly in mean lesion score, significant
233 differences in lesion site and severity were found between locations. Rural donkeys were
234 more often observed to have no lesions at different body sites compared with urban donkeys
235 with the exception of the tail and tail base.

236 [Table 3 here]

237 There were significant differences in signs of tethering or hobbling donkeys between
238 locations ($F=58.29$, $P\leq 0.001$); no signs of tethering or hobbling were seen in 11.8% of rural
239 donkeys and 69.1% of urban donkeys. Superficial or healed lesions relating to tethering or
240 hobbling were observed in 86.0% of rural donkeys and 29.4% of urban donkeys. Broken skin
241 and/or immediate subcutaneous layers were apparent in 2.2% of rural donkeys and 1.5% of
242 urban donkeys. No deep lesions relating to these methods of restraint were observed in any of
243 the donkeys sampled.

244 The quality of mucous membranes did not differ significantly between settings with 90.3% of
245 rural donkeys and 91.2% of urban donkeys observed to have normal membranes. The amount
246 of eye discharge observed varied significantly between locations ($F=45.91$, $P\leq 0.001$); 87.1%
247 of rural donkeys had no discharge and 12.9% had a small amount. A greater range was
248 observed in urban donkeys where 36.8% had no eye discharge, 54.4% had a small amount,
249 7.4% had a moderate amount and 1.5% a severe amount.

250 Signs of heat stress were observed in 50.5% of rural donkeys and 5.9% of urban donkeys
251 ($\chi^2=17.95$, $P\leq 0.001$). Signs of heat stressed observed were apathy, flared nostrils and head
252 nodding. Evidence of faecal soiling on the hindquarters did not differ significantly between
253 locations, being observed on 62.4% of rural donkeys and 69.1% of urban donkeys.

254 Hoof shape, horn quality and gait did not differ between donkeys from different locations,
255 although significant differences were observed in sole shape and structure (Table 4).

256 [Table 4 here]

257

258 **Discussion**

259 The two complementary data collection methodologies employed in this study, the donkey
260 owner questionnaire and the donkey welfare assessments, enable the lives and welfare of
261 donkeys in rural and urban Ethiopia to be compared. The findings highlight marked
262 differences in the role and welfare of donkeys between different areas within the same
263 country, demonstrating the importance of understanding the context from both the human and
264 working equid's perspective before staging interventions intended to benefit either party.

265 Donkeys in urban locations were typically owned by older people with no home of their own.

266 In contrast to previous research in Ethiopia (Geiger et al 2020), urban donkey owners
267 reported having fewer dependents than rural donkey owners. The absence of female donkey
268 owners in urban locations contrasts with rural settings where women are the primary users of
269 donkeys. The contribution rural donkeys make through their assistance to women throughout
270 their work is widely recognised (Geiger et al 2020, Stringer et al 2011). There were also
271 differences between locations in the gender preferences reported for their donkey, with male
272 donkeys being preferred by 60% of rural donkey owners and by all of the donkey owner
273 participants in urban settings. This preference was reflected in the donkeys that underwent the
274 welfare assessment; all urban donkeys that were assessed, and 46% of rural donkeys, were
275 male. Most owners think that males have more working capacity and endurance or strength
276 than females. In Geiger et al (2020), donkey owners explained that male donkeys typically

277 cost more to purchase at market and could be a reason why only 46% of rural donkeys were
278 male.

279 Working donkeys are typically utilised for a number of roles unlike other working equids and
280 are consequently seen as more ‘multipurpose’ animals (Usman et al 2015). The variety of
281 roles donkeys assist in is much wider in rural communities where donkeys form an integral
282 part of all income generating activities including those related to agriculture, livestock,
283 domestic service, the sale of charcoal and wood, and carrying water. The critical role that
284 donkeys fulfil in rural locations serves to emphasise their value to these communities and the
285 benefits they bring, and dispels the perception that rural donkeys work less than those in
286 urban areas that was reported by urban participants in previous research (Geiger et al 2020).

287 Wounds are commonly found on working donkeys and the majority, if not all, are typically
288 inflicted by humans (Stringer et al 2011). The lesions observed in the donkeys at both
289 locations were likely to reflect the different work they undertook and the equipment
290 associated with those roles as found in previous studies (Burn et al 2010, Mekuria and Abebe
291 2010, Pritchard et al 2005, Usman et al 2015). Fröhlich et al (2020) found an association
292 between the number of dependents the owner supported and wound prevalence in working
293 horses in Fiji, speculating that this may be due to the increased work demands placed on the
294 equine to generate enough income to support a higher number of people. However, there was
295 no significant difference between urban and rural donkeys when total lesion scores were
296 compared in this study, despite the difference in the number of dependents supported by the
297 donkeys in each area. The high occurrence of ectoparasites in rural donkeys is likely to
298 reflect their different role in rural settings and their exposure, particularly their close contact
299 with other animals, and this difference in parasite load has also been found previously (Burn
300 et al 2010).

301 While owner attitudes towards hitting donkeys did not significantly differ between locations,
302 there was a significant difference between the amount of hitting observed prior to the
303 donkeys undergoing welfare assessment, with over a third of rural donkey owners observed
304 hitting their donkey compared with 3% of urban donkey owners. This may reflect contextual
305 differences between rural and urban locations at the point the donkeys were identified for
306 welfare assessment. However, it could also relate to differences in the empathy shown
307 towards donkeys between regions which would have implications for the care and treatment
308 the donkeys receive (Lanas et al 2018, Luna and Tadich 2019).

309 Including behavioural indices alongside physical indices in the welfare assessment is a
310 valuable means of investigating the impact of the treatment they receive on donkey mental
311 wellbeing (Haddy et al 2020). The behaviour of the donkeys toward the assessor differed
312 significantly between locations. Urban donkeys were more alert and less apathetic than rural
313 donkeys. Urban donkeys stood still when the assessor approached, in contrast to the rural
314 donkeys who turned toward the assessor. Only a small proportion of the donkeys assessed in
315 both locations responded aggressively towards the assessor when they approached. In
316 contrast to previous studies, rural donkeys exhibited more aggressive behaviour than urban
317 donkeys (Burn et al 2010). Comparing how the donkeys reacted to the approach of their
318 owner with their response to an unfamiliar assessor, as has been done in other studies
319 (Popescu and Diugan 2013), would be useful to the welfare assessment, enabling the
320 specificity of this response to be teased out.

321 Apathy is considered a key welfare indicator for working equids because of its association
322 with numerous physical welfare concerns (Burn et al 2010b, Fröhlich et al 2020, Haddy et al
323 2020, Popescu et al 2014, Usman et al 2015). Given this association, the fact that 80% of
324 rural donkeys in this study exhibited signs of apathy is a significant welfare concern. The
325 higher level of alertness observed in the urban donkeys, suggests that, contrary to perception

326 (Geiger et al 2020), urban donkeys may have a higher standard of welfare than their rural
327 counterparts. There is the possibility that the apathy reported may be a consequence of study
328 design. Other researchers have expressed concerns that unless donkeys are interrupted from
329 their work to be assessed, resting behaviour may be confused with apathy (Popescu and
330 Diugan 2013). All of the rural donkeys and 18% of the urban donkeys assessed in our study
331 were observed at rest prior to undertaking the welfare assessment. Deepening our
332 understanding of apathy in animals, particularly working equids, would help us differentiate
333 between apathy as an indicator of negative physical and/or mental welfare, learned
334 helplessness and exhaustion through inadequate nutrition, or excessive work (Fröhlich et al
335 2020, Pritchard et al 2005) or potentially an energy conservation strategy. Recognising true
336 apathy in working equids is of paramount importance.

337 There was no significant difference between locations in the age of the donkeys assessed, and
338 it was positive to note that 17% of rural donkeys and 27% of urban donkeys were aged 16
339 years or over when the working life expectancy of a donkey has previously been estimated at
340 4-6 years (Usman et al 2015) with a life expectancy of 9-13 years (Stringer et al 2011). The
341 age of our sample may account for the amount of wither and spine lesions seen in the
342 donkeys assessed, as these lesions have been found at higher prevalence in donkeys over 15
343 years of age (Mekuria and Abebe 2010).

344 While the locations did not significantly differ in the gait abnormalities observed, a larger
345 proportion of urban donkeys showed moderate or severe gait deviation during assessment,
346 further supporting previous findings that urban donkeys show more lameness issues than
347 rural donkeys (Morgan 2006). It was positive to see that over a third of donkeys in each
348 location exhibited a normal gait on assessment, particularly given that lameness is one of the
349 main welfare issues reported in working equids globally (Lanas et al 2018, Pritchard et al
350 2005). Urban donkeys bore fewer lesions indicative of tethering and hobbling than rural

351 donkeys where these lesions were identified in 88% of individuals assessed. This is likely to
352 reflect the differences in management practice between regions as urban donkeys are often
353 confined in rented shelters overnight (Geiger et al 2020). Tethering/hobbling are still
354 common practices for restraining working equids throughout the world, and Haddy et al
355 (2020) recently reported that over half of the donkeys sampled in Spain and Portugal bore
356 marks and lesions indicative of tethering.

357 It is crucial to consider human factors and attitudes, alongside the animals, when designing
358 welfare interventions (Pritchard et al 2018). Animal welfare concerns are often
359 anthropogenic, and consequently could be overcome if human attitudes and practices were
360 changed. This is particularly true for donkeys. Understanding what people do and why is
361 critical for success (Haddy et al 2020, Upjohn et al 2014) and interventions must be bespoke
362 (Kubasiewicz et al 2020) to reflect the differences in practices and beliefs between areas. In
363 this study donkeys were considered to be low status animals, below that of cows. This is
364 likely to contribute to them being overlooked in terms of food and veterinary care in favour
365 of those with perceived higher value (Martin Curran et al 2005, Mekuria and Abebe 2010,
366 Stringer et al 2011, Usman et al 2015). This attitude is not found only in Ethiopia but is also
367 reported by working donkey owners in Europe (Haddy et al 2020).

368 Our findings provide a broad insight into the socio-economic value and welfare of working
369 donkeys in rural and urban Ethiopia and highlight the differences between these settings. It is
370 important to recognise the limitations of the approach taken, particularly the risk of the
371 Hawthorne affect biasing participant's answers to items in the questionnaire (Fröhlich et al
372 2020, Stringer et al 2011, Upjohn et al 2012), and that the welfare assessment represents
373 welfare at a single point in time (Pritchard et al 2005), although this is ameliorated to an
374 extent by the inclusion of measures (e.g. lesion scores) that reflect welfare challenges
375 accumulated over time. Interpreting the findings of such studies also presents challenges of

376 its own for example, the weighting given to different measures and the question of whether
377 good welfare scores can ever cancel out bad ones (Kubasiewicz et al 2020). Our findings,
378 however, show the value in taking a more holistic approach to working equids' welfare
379 assessment and the necessity of understanding the situational factors and attitudes influencing
380 the human component of these vital human-equine interactions when designing targeted
381 interventions for welfare improvement. Donkeys in rural and urban settings have different
382 roles to play within these communities and face different welfare challenges. Consequently,
383 the recent development of the Equid Assessment Research and Scoping (EARS) tool (Haddy
384 et al 2020; Raw et al 2020, Watson et al 2020) and the Welfare Aggregation and Guidance
385 (WAG) Tool (Kubasiewicz et al 2020; Norris et al 2020) by The Donkey Sanctuary represent
386 an important advancement in standardised protocols that encompass both the human and
387 equine elements of working equids welfare.

388 **Animal welfare implications**

389 Rural and urban working donkeys are critical for their owners' income-generating activity
390 and therefore their livelihoods. The work they undertake differs substantially between
391 locations, as does their welfare. Work in each setting presents its own challenges and these
392 are reflected in the behaviour and physical health of the donkeys. Rural donkeys showed
393 more apathetic behaviour, a higher ectoparasites burden and increased evidence of
394 tethering/hobbling. Urban donkeys were more alert and had a wider range of body condition
395 scores. The severity of lesions observed in different anatomical locations differed between
396 rural and urban donkeys, although there was no significant difference in overall lesion score.
397 Despite their significant financial contribution, donkeys were still perceived as low-status
398 animals by participants in both rural and urban locations.

399

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405

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