

1 **Equine nutrition: A survey of perceptions and practices of horse owners**
2 **undertaking a massive open online course in equine nutrition**

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20 Key words: equine nutrition, horse owners, online course

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22 **Abstract**

23 ~~This study involved a global survey designed to assess perceptions and practices of horse owners~~
24 ~~registered on an open access online equine nutrition course.~~—An online survey was designed to ascertain
25 the following information: demographics, current feeding practices, and perceptions and knowledge of
26 equine nutrition, including nutrition-related disorders. Response rate was 34 ~~percent%~~ (6538
27 respondents). Over 80 ~~percent%~~ of respondents were horse owners or carertakerss, with the
28 majority owning between one and five horses (75 %) aged 5 and over (74 %). Most kept their
29 horses for pleasure (54 %), with 33 ~~percent%~~ using them mostly for competition and 13
30 ~~percent%~~ using them for an equal mix of both pleasure and competition. Concentrates were
31 fed by the majority (87 %) and over 70 ~~percent%~~ stated that their horses had some access to
32 pasture. Over half of respondents (60 %) regularly monitored their horses' weight, with most
33 doing this monthly. Weight tapes were most commonly used (62%), although many reported
34 to guess the weight of their horse(s) with very few (5 %) ~~5~~ using weight scales. Under half (46
35 %) stated that they regularly used body condition scoring (BCS), many did not BCS at all (24
36 %) and some did not know what BCS was (10 %). Of those that did BCS, most (36 %) did this
37 monthly, with others s doing this weekly (25 %), daily (14 %) and when they remembered (15
38 %). Overall knowledge of nutrition was reported by most as average (median = 3 on Likert
39 scale: average); however, respondents were less knowledgeable on the management of
40 nutrition-related disorders.

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49 1. Introduction

50 Equine nutrition, and the importance of implementing correct diets for horses, is becoming
51 increasingly significant to ensure good health and welfare. There are a number of equine
52 ailments that are commonly seen that could be prevented if dietary rations were better
53 understood by those who administer them [1]. However, despite the growing recognition and
54 evidence of the impact of poor nutrition on equine health, widespread inappropriate feeding
55 management still exists [2-4]. There is evidence to suggest that many horse owners have a
56 poor understanding of equine nutrition [2] and decisions regarding nutritional management are
57 often based on tradition, folklore and misinformation [5]. Equine nutritional issues are a
58 growing concern as there is an increase in horses suffering from nutrition-related disorders
59 such as obesity, colic, laminitis and equine metabolic syndrome (EMS) [2]. Such issues often
60 occur due to a lack of knowledge and understanding of how nutritional management can impact
61 ~~on~~ the development of several equine clinical conditions [6] and indeed it has been reported
62 that many horse owners have been identified as incorrectly feeding their horses [3]. However,
63 whilst there have been some studies undertaken to evaluate the nutritional practices of horse
64 owners [2-4], all of which have yielded valuable information, further information on the
65 nutritional perceptions and practices of a widespread population of horse
66 owners/~~carers~~scaretakers would be extremely useful. Consequently, the aim of this study was
67 to investigate the knowledge and confidence and perceptions and practices of equine nutrition
68 by a global population of horse owners/~~carers~~scaretakers registered on a free online course in
69 equine nutrition.

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73 2. Materials and Methods

74 2.1 Participants

75 This study involved a global survey designed to ascertain participants' knowledge of equine nutrition.
76 Nineteen thousand participants were registered ~~in~~ on an open access online equine nutrition course that
77 ran in January 2013. The course was open to anyone to join, with the only requirements being internet
78 access and the ability to communicate in English. The course content included anatomy and physiology
79 of the equine digestive tract, equine nutrient sources and dietary management for horses and ponies,
80 particularly those with nutrition-related disorders. Ethical approval was sought and received from
81 the University's School of Veterinary Studies' ethics committee.

83 2.2 Survey Design

84 An online survey (Bristol Online Surveys, 2011) was designed ~~specifically for the purposes of~~
85 ~~the survey~~ to assess participants' knowledge of equine nutrition. All 19,000 pParticipants were
86 asked to complete the survey at the start of the online course. The survey consisted of three
87 sections: demographics, current feeding practices, and perceptions and knowledge of equine
88 nutrition (a copy of the survey can be obtained from the author). The survey mainly consisted
89 of Likert scale questions, where there was a choice of a number of fixed alternatives. A number
90 of questions were similar to some of those asked by Hoffman *et al.* [2] in their survey of horse
91 owners' feeding practices and knowledge of nutrition. As the study population was global it
92 was particularly important to ensure clarity of questions in order to reduce the impact of
93 differences in language and culture within the survey results [7]. Survey questions were kept
94 short to increase participant understanding and response rates [8]; specific terms rather than
95 generalised ones were used where possible, again to aid in respondents understanding [9].
96 Vague terms such as 'maybe' or 'probably' were avoided to improve clarity and validity of
97 answers as recommended by Dillman [10]. Questions were designed to encourage participants
98 to think about what they currently do and not about past behaviour; research has shown that

99 more accurate responses are obtained when people are asked to consider something that has
100 occurred recently, within the last month, as opposed to a further back event [7]. Pre testing
101 via a pilot survey was carried out as recommended by [Robson](#) [11]. The final survey was a
102 28 question, multi-part survey and emailed to all participants of the online nutrition course.

103

104 **2.3 Data Analyses**

105 Data were gathered in [the](#) Bristol Online Survey tool and were downloaded into an Excel spread
106 sheet in a coded form with a key. Quantitative data were analysed for descriptive statistics and
107 non-parametric statistical tests using SPSS statistical software. All data were analysed for
108 median and measures of variation.

109

110 **3. Results**

111 **3.1 Response rate and demographics**

112 The survey response rate was 34 ~~percent%~~, with 6538 out of ~~a possible~~[the](#) 19,000 course
113 participants responding. The majority of respondents (90 %) were female aged between 25
114 and 54 (65 %). Respondents were predominantly from the UK (~~37 %~~) and the USA (~~28 %~~),
115 followed by Canada (~~8 %~~) and Australia ([Figure 15 %](#)). The remaining respondents were from
116 more than 100 countries across the globe. Less than 5 ~~percent%~~ of respondents had taken an
117 online course previously, although over 80 % had undertaken either further or higher education
118 since leaving school, with over 50 % having either a graduate or post-graduate degree. The
119 amount of experience of with horses varied from less than one year to over 25 years (Figure
120 [24](#)), with over 75 ~~percent%~~ of respondents having more than six years' experience and over 30
121 ~~percent%~~ having more than 25 years of experience. Over 80 ~~percent%~~ of respondents were
122 horse owners or ~~carers~~[scaretakers](#). The majority of horse owners had between one and five
123 horses (75 %) aged 5 and over (74 %). Most horse owners kept their horses for pleasure (54

124 %), with 33 ~~percent%~~ using them mostly for competition and 13 ~~percent%~~ using them for an
125 both pleasure and competition.

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127 3.2 Current feeding practices

128 Over 70 ~~percent%~~ of respondents reported that decisions on feeding management were
129 undertaken by the main owner or carer of the horse. Of those that owned horses, 60 ~~percent%~~
130 stated that they regularly monitored their horses' weight. The frequency of weight checks
131 varied, but most reported to monitor weight monthly (Figure 32). Of those that selected "other"
132 as their response, further investigation showed that the majority of those respondents only
133 checked weight for medical/~~de~~worming purposes. Weight tapes were the most commonly used
134 method of weight determination (62%), although many reported to guess the weight of their
135 horse(s). ~~The use of weight tapes was~~ higher in competitive riders (28 %) compared to
136 pleasure riders (21 %). Five ~~percent%~~ of respondents used livestock weight scales accessed
137 through their veterinary practice or feed retailer.

138

139 Less than two ~~percent%~~ of respondents reported to use body condition scoring (BCS) as a
140 means of monitoring their horses ~~condition weight~~. However, when asked specifically about
141 the use of BCS, 46 ~~percent%~~ of respondents stated that they regularly used BCS to monitor
142 their horse's weight, with 24 ~~percent%~~ stating that they did not BCS and 10 ~~percent%~~ reporting
143 to not know what BCS is. Of those that did use BCS, most (36 %) did this monthly, followed
144 by weekly (25 %). Some reported to BCS daily (14 %) and other~~s~~ when they remembered (15
145 %).

146

147 With regards to fibre in the diet, grass hay and pasture were the most frequently used sources
148 (Figure 43). The mean average amount of fibre fed was calculated to be 84 ~~percent%~~ with the

149 majority (58 %) feeding 90% or more. Less than 3% of respondents fed 40 ~~percent%~~ or less
150 those who currently own and manage horses 67 % reported that they feed some form of ad-lib
151 forage to their horses. Generally horses at pasture or fed hay/haylage were given ad-lib forage.
152 Bagged forage or fibre based feeds like sugar beet pulp, were generally restricted in some way.
153 Use of the horse did not seem to affect the amount of forage fed; 63% of performance horses,
154 64% of pleasure horse owners and 61% of those that own both pleasure and performance horses
155 stated that they fed forage on a purely ad-lib basis only. The majority of respondents (70 %)
156 stated that their horses had some access to pasture. Restricted access ranged from hand grazing,
157 limited turnout depending on workload, seasonal restrictions due to diet issues, and then split
158 between 24 hours in the summer and just daylight hours in winter. When specifically asked
159 about slow feeders, 36% of respondents said they used them, with haynets (67%) being the
160 most commonly used. A large number of respondents did not use slow feeders (55%), they fed
161 on the floor or used a hay rack/net, and 9% did not know what slow feeders were.

162
163 Concentrates were fed by the majority (87 %) of owners. Commercial premixed feed was the
164 main concentrate used (58 %) and 20 % mix their own ration. Of all respondents, 14 % stated
165 they did not feed any concentrate. Of all those who currently feed concentrates (4517) 29
166 ~~percent%~~ weighed their feed or used a manufacturer's level/measure/scoop designed to
167 measure a known amount for that specific feed. However, 68 ~~percent%~~ reported to feed by
168 volume only via scoops, cans, or cups, whilst 3 ~~percent%~~ selected the other category and
169 reported 'a handful' or 'by eye'. This would indicate that overall a large amount of horse
170 owners (71 %) are not weighing the amount of concentrates fed. Over 80 ~~percent%~~ of owners
171 reported to feed at least one form of supplement to their horse(s) with salt, fats/oil and
172 ~~ne~~utraceuticals being the most commonly fed (1712, 1345, 1575 respondents, respectively).
173 Sixty ~~percent%~~ reported using supplements because they think their horse(s) needs it, with 24

174 ~~percent%~~ doing so on veterinary advice. The remainder of respondents reported using
175 based on their trainer's advice or someone else recommending the supplement.

176

177 3.3 Perceptions and knowledge

178 Ninety ~~percent%~~ of respondents stated that nutrition was very important in a horse care plan.
179 Respondents stated that they get their information from a variety of sources (Figure 54) with
180 veterinarians (54 %), magazines/reference books (46 %) and other horse owners/friends (40
181 %) being the most popular. The preferred methods of receiving information (Figure 65) ~~appears~~
182 ~~to be~~ are via reading short articles online (60 %) or in print (54 %). The top five nutritional
183 concerns were reported as hoof condition, joint longevity, colic, care of the senior horse and
184 laminitis. Overall knowledge of nutrition was reported by most as average (median = 3).
185 Average knowledge was also reported by most for digestive anatomy, digestive physiology,
186 nutrition sources, weight and body condition scoring, and feeding seniors and overweight
187 horses (Figure 76). However, respondents appeared less knowledgeable (median = 2: below
188 average) on feeding malnourished horses and on a number of nutrition-related disorders such
189 as insulin resistance (IR), equine cushings disease, equine metabolic syndrome (EMS),
190 recurrent equine rhabdomyolysis (RER), equine gastric ulcer syndrome (EGUS), and recurrent
191 airway obstruction (RAO) (Figure 87). For other conditions: polysaccharide storage myopathy
192 (PSM), developmental orthopaedic disease (DOD) and hyperkalaemic periodic paralysis (HPP)
193 respondents reported to have a poor (median = 1) knowledge of these. Respondents felt most
194 knowledgeable on colic and laminitis (median = 3: average). Of the 419 veterinarians that
195 responded, knowledge of these areas were generally higher, either average (median = 3) or
196 above average (median 4).

197

198 4. Discussion

199 **4.1 Response rate and demographics**

200 The overall response rate (RR) to the survey was 34 %, which is better than that reported for
201 other online equine related surveys, such as Wickens *et al* [12] who reported a 20% RR and
202 Bolwell *et al* [13] who reported a 23% RR. The higher number of female respondents concurs
203 with that reported in other equine-related surveys [12] and also relates to the high numbers of
204 females involved in the equine industry generally, which have been reported as over 90
205 ~~percent%~~ [14, 15] [16]. There was a greater age spread of the respondents in this current survey
206 compared to others [15]; however, this may be attributed to the online course and the
207 widespread of demographics accessing the current survey. The finding that 54 ~~percent%~~ of
208 horse owners were pleasure riders is similar to the finding of the AHP survey [15] and the
209 number of horses owned reported in this study concurs with the findings of Wickens et al. [12]
210 who reported a median number of horses owned as 4.

211
212 Considering the geographical distribution involving respondents from over 100 countries, as
213 well as the variation in the amount of years' experience with horses and level of education, this
214 study demonstrates that nutrition is a subject of great interest, regardless of geographical
215 location, level of education or time spent in the industry. Coupled with ongoing reports of
216 inadequate feeding practices [2] and the ever increasing rates of nutritional-related disorders
217 [2, 6, 17-19], it appears nutrition education is an area that requires concentrated information
218 dissemination from appropriate educational sources.

219
220 **3.2 Current feeding practices**

221 It would appear that horse owners and ~~careers~~caretakers are making the main decisions relating
222 to the nutritional management of their horses, which concurs with previous findings [15].
223 Consequently, it would seem pertinent to ensure that this demographic is targeted with relevant

224 nutritional information. In terms of monitoring their horses weight, a high proportion (over 70
225 %) of people reported to regularly check the weight of the horses they own or manage.
226 Bodyweight ~~and~~ body condition checks are important to ensure that appropriate dietary
227 rations are developed for maintaining optimal health of the horse. However, it is of concern
228 that a substantial number reported to make these checks far less frequently than the
229 recommended 2 to 4 weeks required to ensure that feeding programmes can be altered
230 appropriately to prevent weight loss or gain that may lead to clinical issues such as laminitis or
231 equine metabolic syndrome [20, 21]. Moreover, many reported to only weigh their horse(s) for
232 medical purposes, which concurs with the findings of Johnson *et al.* [22] who reported that 100
233 ~~percent%~~ of veterinarians and 94 ~~percent%~~ of horse owners in their study stated that
234 determining the appropriate dosage of medicines was the most important use of how much a
235 horse weighed. The ease and convenience of weight tapes appears to lead to this being the
236 most commonly used method to monitor weight, although many respondents reported to guess
237 the bodyweight of their horses by eye. However, it has been found that even the most
238 experienced horse owners/trainers routinely underestimate bodyweight [22] and that there is
239 no correlation between accuracy of weight estimation by eye and years of experience. These
240 tapes have been regarded as inaccurate for determining weight [23, 24]; however, they do serve
241 as a useful tool for monitoring weight changes if they are consistently placed around the horse
242 in the same way [20]. Nevertheless, it is important to note that horse owners may need more
243 education on how to use weight tapes correctly depending on the weigh tape selected for use
244 as there are many available [24].

245 Body condition scoring (BCS) is indicated as being one of the most useful tools for weight
246 management [25]; however, the results of this current study indicate that horse owners do not
247 fully understand what BCS is, with 46% of respondents stating that they used BCS on a regular
248 basis and then stating that they used weight tapes to do this. Moreover, 10 % of respondents

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249 stated they did not know what BCS was. However, on closer inspection of the results, 95
250 respondents who did not know what BCS was, stated using eye and feel to assess their horse's
251 condition, which is the basis of BCS [26]. ~~However, it has been found that even the most~~
252 ~~experienced horse owners/trainers routinely underestimate bodyweight [22] and that there is~~
253 ~~no correlation between accuracy of weight estimation by eye and years of experience.~~
254 Therefore, this is another area where further education of owners ~~may~~ benefit the well-
255 being of the equine population as obesity and regional adipose tissue can indicate equine
256 metabolic syndrome and insulin resistance [27, 28]. Moreover, greater consideration needs to
257 be given to natural seasonal fluctuations in BCS that has been recorded in feral [29], native
258 [30] and domesticated, leisure populations [17]. Typically, the management of domestic horses
259 places an emphasis on keeping horses at a 'good' condition (BCS = 5/9) year round [17]. Due
260 to the high prevalence of overweight horses and ponies reported in the UK, Canada and USA
261 [19] owner perception of BCS may have been skewed to tend towards the higher end of the
262 scale [17]. Owners need to be aware that horses ending the summer with an overweight or
263 obese BCS can withstand a much lower plane of nutrition and weight loss through the winter
264 months [17]. Obesity in horses and ponies is rising [17-19] and regular monitoring of weight,
265 taking into account seasonal fluctuations, may help to better manage this growing population
266 of obese animals.

267
268 The finding that all horse owners fed horses a ration consisting of over 80 ~~percent%~~ fibre was
269 reassuring, since fibre is required to maintain healthy gut function and prevent gastrointestinal
270 disturbance [31-33]. Moreover, almost 60 ~~percent%~~ of respondents fed more than 90 ~~percent%~~
271 fibre in the diet of their horses. A small number of respondents (296: 6 %) reported to feed less
272 than 50 ~~percent%~~ fibre; however, closer inspection of the data revealed that 155 of those had
273 stated in a previous question that they gave their horse(s) free choice/ad lib forage.

274 Consequently, it would appear that there is some misunderstanding around the terminology and
275 the types of feedstuffs that are regarded as fibrous feeds. As fibre is such a critical component
276 of the horse's diet this highlights an important area to direct future educational resources.

277

278 Although over half of respondents reported to use their horses for pleasure riding, almost 90
279 ~~percent%~~ of people reported to feed concentrates, which is slightly lower than the 96 %
280 reported by Hoffman et al. [2]. This difference may be attributable to sample size (n = 6538
281 versus n = 67, respectively). Nevertheless, what was apparent from the findings of this current
282 study is that many people seem unclear of what constitutes a feedstuff being regarded as a
283 concentrate; for example, fibre replacers were commonly reported as concentrate feeds. This
284 does not pose an issue nutritionally and indeed may satisfy an owner's need to reward the horse
285 for work done, which was the main reason given by owners for feeding concentrates. However,
286 it does highlight a lack of knowledge regarding nutrients in the diet, particularly with regard to
287 excess energy and is another area where horse owners would benefit from further education.

288 The other issue related to feed measurements, ~~was that~~ almost 70 ~~percent%~~ of respondents
289 ~~reported~~ feeding by volume and not weight. A similar observation has been reported in
290 competition horses [34] with 100 ~~percent%~~ of horses, in varying disciplines, being fed by
291 volume and not by weight. With the ever increasing rates of equine obesity and the metabolic
292 issues [17-19] (~~Giles et al., 2014; Robin et al., 2014; Slater, 2014~~), particularly in leisure horses,
293 that are considered a direct result of inappropriate feeding practices, this should be an area of
294 horse owner education that is given priority.

295

296 ~~Overfeeding and nutritional mismanagement not only have implications for equine health and~~
297 ~~digestive or nutritional imbalances, but they are also the main cause of environmental loss of~~
298 ~~nutrients [35]. Diet composition influences the amount and composition of waste [36, 37] and~~

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299 ~~overfeeding can lead to a concentration of nutrients in manure. In particular, phosphate can~~
300 Dietary supplements were fed by 82 ~~percent%~~ of respondents, which again concurs with the
301 findings of Hoffman et al. [2] (84 %). The most commonly used supplements were reported
302 as salt, joint supplements and fat/oils. Joint support was also cited as the mostly commonly
303 used supplement by Hoffman [2], Burk [4] and by the AHP survey 2012 [15]. Similar results
304 were reported by Martin [34] with the most common supplements used for hoof quality and
305 joint health. The use of supplements appears to be related to a desire for improved health or
306 performance; however, the efficacy of many supplements remains unproven [38-40].
307 Moreover, ~~many respondents reported that~~ they often fed without ~~the~~ first determining the
308 horse's nutrient requirement needs or the potential impact of the supplement on the overall
309 nutrient intake. As a result, certain nutrients can be over supplemented and interfere with the
310 interaction and absorption of others [4]. Honore and Uhlinger [3] found that horses fed
311 supplements were twice as likely to have some form of dietary excess compared to those
312 receiving no supplements in their diet. The majority of supplements (60 %) were selected by
313 horse owners, with 24 % consulting their veterinarian on this decision. This is an important
314 finding as recent research has shown that veterinarians generally do not feel confident in giving
315 sound nutritional advice and often lack the necessary training required to ~~advise~~ see horse owners
316 appropriately [5]. Therefore, it would seem pertinent to provide advice and training on the use
317 of supplements to both horse owners and veterinarians. In contrast to other studies concerning
318 sources of nutritional advice, Burk and Williams (2008) reported trainers and feed dealers as
319 the most important sources. While this may be due in part to the small, targeted sample size
320 of n=12 riders in a New Jersey Fresh 3 Day event, it nonetheless again highlights the multi-
321 source approach to sourcing nutritional advice and gives further insight into the potential
322 targets for nutrition information dissemination.

323

324

325 3.3 Perceptions and knowledge

326 Ninety five ~~percent%~~ of respondents reported equine nutrition as very important in relation to
327 horse care, with over 50 ~~percent%~~ relying on their veterinarian for nutritional advice. As
328 mentioned previously, veterinarians may not always be the most knowledgeable on equine
329 nutrition. ~~Veterinarians as they~~ have a wide range of species/conditions to keep up to date with
330 and often do not have the time to keep abreast of the latest developments in equine feeding and
331 some feel it is not important for them to do so [5]. Many veterinarians do not have a nutritional
332 background [5], ~~and~~ nutrition plays a very minor part in the veterinary curriculum and many
333 new graduates have reported to have low confidence in giving nutritional advice to clients [5,
334 41]. Despite recommendations to improve this [42], there is little evidence to support an
335 improvement in the area of equine nutrition [5]. After veterinarians, magazines and other horse
336 owners/friends were most often consulted for horse care advice, which supports the findings of
337 previous studies [2, 13, 15, 43]. For receiving nutritional information, almost 60 % of
338 respondents stated they would prefer reading short articles online, which again concurs with
339 the ~~findings~~ of others [14, 43]. Given that it appears that veterinarians and the internet are the
340 most widely used support for equine nutrition advice it would seem advantageous for
341 veterinarians to be aware of appropriate web resources in order to direct their clients to
342 evidence-based information for guidance. Moreover, electronic newsletters have been found to
343 be a very useful way of horse owners obtaining information in relation to nutritional advice
344 [44] and there is evidence to suggest that horse owners modify their feeding regimes as a result
345 of these types of communications [43]. Although the emphasis on some sources of information
346 has changed with the introduction of the web what is clear is that horse owners obtain their
347 advice from a number of sources, which concurs with other reports [2, 43]. This multisource
348 approach can lead to horse owners becoming overloaded with a variety of recommendations,

349 many of which may not be based on scientific fact and therefore the dietary management of
350 horses may suffer [5]. Given that veterinarians do not appear to have the necessary nutritional
351 background or the time to stay up to date with nutritional recommendations, it would appear
352 timely to shift the sole responsibility away from the veterinarian to other well-informed sources
353 of nutritional advice, such as the equine nutritionist, equine scientist or extension agent.
354 However, ~~in~~In a survey by Roberts and Murray [5], the majority of veterinarians (80 %) placed
355 a strong emphasis on the importance of the equine nutritionist as a source of information, ~~yet~~
356 ~~they still~~but when asked about their use of an equine nutrition referral service most stated that
357 ~~they were reluctant to use this. were reluctant to use such a referral equine nutrition service.~~
358 The reluctance to make use of such a valuable and readily available source of equine nutrition
359 information warrants further investigation.

360
361 The main nutritional issues reported in this study concur with others [2, 15, 43], with hoof care,
362 joint longevity, care of the senior horse and colic highlighted as the top areas of concern. This
363 may be due to these conditions being some of the most common ailments seen by clinicians
364 and it is of note that these are also the same conditions that some veterinarians are most
365 confident discussing as reported by Roberts [5]. When responding to questions regarding level
366 of knowledge of specific ailments/issues, many respondents reported their knowledge of this
367 ~~as this was~~ poor (median = 1: poor) for several conditions, including development orthopedic
368 disease and polysaccharide storage myopathy. Knowledge was below average (median = 2:
369 below average) for insulin resistance, EMS and equine gastric ulcer syndrome, which is of
370 concern as these are conditions that are commonly seen in horses and ponies [18, 45, 46].
371 Conversely, respondents appeared more knowledgeable (median = 3: average); on other
372 conditions such as colic and laminitis. Considering that the main areas of nutritional concern,
373 reported in this study and others [2, 15, 43] are influenced by current feeding and management

374 practices, it may be time to start focusing on a more preventative approach with an emphasis
375 on better meeting the basic nutritional needs of the horse in the domesticated setting.

376
377 Assessing the knowledge and feeding practices of a large global population of horses owners
378 and caretakers has provided a unique insight into the nutritional management of horses across
379 the globe. It would appear that there are a variety of methods used to create suitable feeding
380 regimes for horses, many with no scientific basis. Many respondents had a lack of
381 understanding of monitoring body weight and condition, and thus further education in this area
382 is required. Many respondents reported a preference for receiving this information via short
383 articles online and therefore online courses such as the one reported in this paper appear to be
384 valuable for educating horse owners and caretakers.

385

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