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Characterization of Horse Use in Therapeutic Horseback Riding Programs in the United States: A Pilot Survey

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1 Title: Characterization of Horse Use in Therapeutic Horseback Riding Programs in the United States: A
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12

13 Abstract

14 With increasing public scrutiny on animal welfare, it behooves those involved in the equine industry to
15 revisit best management practices to ensure these support healthy horses. There is little published
16 research on how horses are used in the equine industry, particularly in therapeutic horseback riding
17 (THR) programs. While there is a large amount of information on the benefits of THR programs to the
18 participants, there is little published information available about the horses. Therefore, the objective of
19 this survey was to gather data regarding horse use and care in Professional Association of Therapeutic
20 Horsemanship International (PATH Intl.)-affiliated THR programs in the United States to help establish a
21 foundation for a standard of care. A 20-question survey sent to 659 PATH Intl.-affiliated THR programs
22 returned a 40% response rate. Demographics demonstrated that the median number of horses in each
23 program was 10; geldings outnumbered mares; most horses were between 16 to 20 years of age; and
24 Quarter Horse or stock-type breeds predominated. Sessions lasted an average of 8 weeks with 45
25 minute lessons. Horses were typically ridden by clients 4 days/week and 2 hours/day. Most horses were
26 donated to the programs, participated for approximately 7 years, and left due to aging. Limb lameness
27 and back soreness were the top health issues noted, with only a small percentage of colic and ulcers
28 reported. More horses received NSAIDs for a lameness issue, chiropractic adjustment, and massage than
29 any other supplemental care or complementary therapy. Based on data gathered in this survey, THR
30 horses were not worked excessively. Horses were ridden less than PATH Intl.'s maximum
31 recommendation of 6 hours/day and 6 days/week and less than those used in university programs.
32 Horses in THR programs also appeared to have fewer reported health issues as compared with data in
33 other national reports.

34 Keywords: horse use, therapeutic horseback riding

35

36 Introduction

37 Animal-assisted intervention, including therapeutic horse riding (THR), is designed to promote
38 improvement in a person’s physical, social, emotional and/or cognitive functioning, and is directed or
39 delivered by a practitioner with specialized expertise [1]. While there is abundant research on the
40 benefits of THR to human participants [1,2,3,4,5,6], there is little information regarding effects on
41 horses involved in such programs [7].

42 The Professional Association of Therapeutic Horsemanship International (PATH Intl.) seeks to both
43 credential and improve therapeutic institutions in the United States and protect therapy horses [8].
44 PATH Intl. regularly publishes a Standards for Certification and Accreditation Manual that includes
45 guidelines for implementing a training/conditioning program; observing physical soundness and
46 behavior of horses before the therapy session; maintaining thorough health records; limiting horse
47 workloads to no more than 3 continuous hours and no more than 6 total hours/day; and recommending
48 a maximum work week of 6 days based on the expectation that interacting with participants can be
49 stressful [9,10]. In order to be accredited or certified by PATH Intl., facilities must follow the published
50 guidelines.

51 Knowing how horses are managed and what health issues are more prevalent in other equine activities
52 can help those working with THR horses to better care for their animals. Therefore, the objective of this
53 study was to gather data regarding horse use and care in PATH Intl.-affiliated THR programs in the
54 United States as a preliminary step toward defining a common standard of care.

55

56 Materials and Methods

57 Neither IRB nor IACUC approval was required since horse owners/managers were surveyed
58 anonymously and horse use was not altered for the purpose of the survey.

59 2.1 Survey Instrument

60 Survey questions were adapted from a previously validated survey on horse use in university programs
61 [11]. Modifications to improve the university survey’s fit to THR programs included adding Questions 1,
62 3, 4, 10, and 13 (Table 1); combining student contact hours questions to form Question 2; changing rider
63 experience categories from years of experience to rider ability in Question 9; and removing questions
64 about student majors, horses being used by other university programs like a veterinary school,
65 characterizing horse behavior, and land area [11]. The final 20 questions were divided into three
66 sections: General Program Questions (n=10), Equine Health and Care (n=6), and Equine Demographics
67 (n=4; Table 1). The survey instrument for this study was reviewed by four faculty members in university
68 Equine Science programs and was subjected to a post-hoc evaluation for content by a professional in the
69 THR industry, but was not validated. However, the university horse use survey by Zhao [11] had been
70 released for a pilot test, and modifications were made before the full survey release.

Table 1. Survey questions used to gather information on therapeutic horseback riding program structure, horse use, and horse health issues

Question	Response Format
General Program Questions	

1	Do you offer riding in sessions? If yes, how long do your sessions last? If no, please explain how your program works.	Yes/No*
2	On average, how many days per week and hours per day are horses ridden by clients? Please enter a number.	Numeric, Open-ended other
3	How often are horses schooled by someone more experienced than a client? Please be as specific as possible.	Open-ended
4	During each lesson, approximately how long do horses stay in each gait? <ul style="list-style-type: none"> • Walk • Trot/Jog • Canter/Lope • Other comments 	Numeric, Open-ended other
5	How do you track horse use in your program? Check all that apply. <ul style="list-style-type: none"> • Daily • Weekly • Verbally • Written • Other. Please explain 	Multiple selection, Open-ended other
6	How are horses in your program acquired? Enter a percentage acquired by each method. <ul style="list-style-type: none"> • Donated • Purchased • Privately owned and leased to program • Other. Please explain 	Numeric, Open-ended other
7	On average, how many years do horses remain in your program?	Numeric
8	What is the most common reason horses leave your program? <ul style="list-style-type: none"> • Chronic lameness • Personality or behavior changes • Aging • Other. Please explain 	Multiple selection, Open-ended other
9	What percentage of clients fall into the following categories relative to their riding ability? <ul style="list-style-type: none"> • Very Limited • Limited • Moderate • Moderately Advanced • Advanced 	Numeric
10	What percentage of clients with the following does your program serve? Enter a percentage of your total client base in each applicable category. <ul style="list-style-type: none"> • Autism Spectrum Disorder • Cerebral Palsy 	Numeric, Open-ended other

- Down Syndrome
- At-risk youth (behavioral disturbances)
- Veterans rehabilitation
- Other. Please explain

Equine Health and Care

- | | | |
|----|---|---|
| 11 | What percentage of horses in your program are shod?
<ul style="list-style-type: none"> • Barefoot • Front shoes only • Front and rear shoes | Numeric |
| 12 | What are the types and frequencies of physical health issues typically encountered each year? Please enter a total number of horses with these issues.
<ul style="list-style-type: none"> • Limb lameness (knee/hock, fetlock, or pastern issue) • Back soreness • Shoulder or hip lameness • Ulcers • Colic • Hoof abscesses • Hoof wall cracks • Other. Please explain | Numeric,
Open-ended other |
| 13 | How do you determine if horses need time off from the program? Check all that apply.
<ul style="list-style-type: none"> • Frequent biting of horse handler while ridden by client or being tacked • Excessive unwillingness to perform tasks when asked • Personality changes with no obvious cause (for example, an injury to the horse may result in personality changes, so that would be an obvious cause) • Other. Please explain | Multiple selection,
Open-ended other |
| 14 | In the last year, what percentage of horses have received the following:
<ul style="list-style-type: none"> • Glucosamine • Joint injections • Chiropractic adjustment • Massage • NSAIDS (bute, banamine) for lameness • NSAIDS (bute, banamine) for reasons other than lameness • Other. Please explain | Numeric,
Open-ended other |
| 15 | How often are health evaluations of horses conducted by staff and/or veterinarians? Check all that apply.
<ul style="list-style-type: none"> • Daily by staff | Multiple selection,
Open-ended other |

	<ul style="list-style-type: none"> • Weekly by staff • Monthly by veterinarian • Once per session by veterinarian • Other. Please explain 	
16	How are horses primarily housed when not in use? Please enter a percentage.	Numeric, Open-ended other
	<ul style="list-style-type: none"> • Stall • Dry lot (dirt paddock with no grass) • Small paddock (with some grazing) • Pasture (with significant grazing) • Other. Please explain 	

Equine Demographics

17	How many horses are in your therapeutic riding program?	Numeric
18	How many of your horses are each gender?	Numeric
	<ul style="list-style-type: none"> • Mare • Gelding • Stallion 	
19	How many of your horses belong to each breed?	Numeric, Open-ended other
	<ul style="list-style-type: none"> • Quarter Horse, Paint, or other stock type • Pony breeds • Draft or Draft-cross • Thoroughbred • Warmblood • Other. Please explain 	
20	How many of your horses fall into the following age ranges?	Numeric
	<ul style="list-style-type: none"> • Less than 5 years of age • 6 to 10 years of age • 11 to 15 years of age • 16 to 20 years of age • Greater than 20 years of age 	

*Due to ambiguity, Question 1 yielded both session and lesson length data.

71 2.2 Sample Selection

72 The survey was sent to 659 PATH Intl.-affiliated THR programs in the United States. Programs were
 73 selected from PATH Intl.'s website using the 'Find a Center' function Jun.-Aug. 2017 and filtered by
 74 activity (Therapeutic Riding). An initial invitation email containing a link to the survey (formed in
 75 SurveyMonkey®) was sent to each recipient via Google Mail Merge. The SurveyMonkey® collection web
 76 link was open from Sep. 20 to Nov. 15, 2017. Reminder emails were sent using a modified Dillman
 77 method at two, four, and six weeks [12].

78 2.3 Data Analysis

79 At the conclusion of the survey, an Excel data file was downloaded from SurveyMonkey®. All survey
80 responses were reviewed and cleaned to a consistent format for data analysis; e.g., questions asking the
81 respondent to enter a number or percentage were converted to Arabic numerals (six to 6, 60% to 60). If
82 a respondent entered a range of numbers or percentages, ranges were averaged to better facilitate data
83 analysis (e.g. 6-12 to 9, 4-6 to 5). Question 3 was coded, grouping similar responses for statistical
84 evaluation. In addition, some responses within a specific question were removed because the
85 respondent was not specific or misunderstood the question.

86 Due to the non-normality of the data, median and Interquartile Range (IQR) were reported, and outliers
87 were identified using boxplots created in Excel 2016 and excluded from further data analysis.
88 Spearman's Rank correlations between measures of horse workload in THR programs and percentage of
89 horses with reported injury were determined. Significance was declared at the 0.05 alpha level, and p-
90 values were adjusted for multiple comparisons using a step-down Šidák adjustment. Numeric data were
91 treated as ordinal while non-numeric data were treated as categorical for the purposes of analyses.

92

93 Results

94 A total of 270 responses were received for a response rate of 40.7%. After reviewing data, six responses
95 were considered ineligible for data analysis because the respondent indicated the program did not ride
96 and, therefore, did not participate in THR. Across the survey, a maximum of 264 responses were eligible
97 for analysis (40.1%). The number of responses collected decreased as the survey continued, ending at
98 246 total responses to Question 20. From total responses to each question, 2-24% were removed due to
99 not participating in THR, misunderstanding the question, lacking specificity, and being outliers.

100 All questions except for Question 10 had responses that required cleaning. Responses in which 'min' or
101 '%' was dropped to provide a numeric answer for analysis in Excel were not included in cleaned
102 percentages. More than half of responses to Questions 1 (session length 68%, lesson length 59%), 3
103 (100%), 4 (56%), and 7 (50%) were cleaned. Question 1 was inherently ambiguous as session was not
104 defined in the question, and respondents entered session and/or lesson length. The data was reviewed
105 and split to session and lesson length for analysis. All responses to Questions 3 were cleaned as this was
106 an open-ended question; responses were reviewed and grouped into response codes for easier analysis.
107 Questions 4 and 7 responses were often a phrase or range of time (e.g. "half of the time", "15 to 20
108 minutes", "until the horses die", "5 to 10 years"), which were cleaned to a numeric answer. For the
109 remaining questions, 0-38% of responses were cleaned.

110 3.1 Equine Demographics

111 The median number of horses in THR programs was 10 horses (IQR=7-14; n=232). Median percentages
112 of mares and geldings were 33.3% (IQR=20-50; n=235) and 66.7% (IQR=50-80; n=237), respectively. The
113 majority of horses belonged to three breed categories: Quarter Horse, Paint, and other stock-type
114 (53.1%, IQR=35.1-72.7; n=240); pony (17.8%, IQR=8.3-28.6; n=238); or draft and draft-cross (10%,
115 IQR=0-21.4; n=237). The most common age of horses in THR programs was 16 to 20 years (33.3%,
116 IQR=20-49.7; n=238) followed by more than 20 years (25%, IQR=12.5-40; n=235) and 11 to 15 years
117 (22.2%, IQR=11.8-38.5; n=238).

118 3.2 General Program Responses

119 THR programs were highly variable in riding program format, with riding time scheduled in sessions
 120 and/or individual lessons. In this survey, a THR 'session' is defined as a set group of rides over a period of
 121 time, while a THR 'lesson' is defined as a single ride, either within or independent of a particular session.
 122 For example, a THR program may have an 8-week session with one 45 minute lesson/week. Median
 123 session length was 8 weeks (IQR=6-10; n=109) while median lesson length was 45 minutes (IQR=37.5-60;
 124 n=142). One program indicated some clients could have ongoing weekly lessons without regard to
 125 sessions, while others rode weekly for 8 week sessions. Eighteen programs indicated they provided
 126 lessons year-round with no defined session.

127 Horses used for THR were ridden by clients 4 days/week (IQR=3-5) and 2 hours/day (IQR=2-3; n=241).
 128 Median total hours/week, calculated by multiplying days/week and hours/day within the same
 129 response, was 9 hours/week (IQR=6-12; n=233). Of all programs, 65.2% indicated horses were ridden
 130 and schooled 1-4 times/week by someone more experienced than a client (n=259). Horses spent 80% of
 131 client ride time at the walk (IQR=69.5-89.0; n=212). The majority of respondents (81.0%) indicated that
 132 horse use was tracked on a daily basis; over half of respondents (58.9%) indicated use was tracked
 133 through hardcopy records while 12 respondents (4.6%) indicated horse use was tracked only verbally
 134 (n=264).

135 Regarding horse acquisition, 50% of horses were donated (IQR=20-89.4), 5% were purchased (IQR=0-
 136 25), and 20% were privately owned and leased to THR programs (IQR=0-50; n=230). The median length
 137 of time a horse spent in a program was 7 years (IQR=5-10; n=216), ranging from 2 to 15 years. Horses
 138 most commonly left THR programs due to aging (56.1%; n=253).

139 Programs were asked to rate the riding ability of their clients, regardless of disorder or disability, in five
 140 categories: very limited, limited, moderate, moderately advanced, and advanced (Table 2). The majority
 141 of riders were rated very limited, limited, and moderate in their riding ability while 40% (IQR=30-60;
 142 n=221) of clients had Autism Spectrum Disorder, 10% (IQR=5-15; n=216) had Cerebral Palsy, 8% (IQR=0-
 143 15.5; n=216) were at-risk youth with behavioral disturbances, and 5% (IQR=2-10; n=209) had Down
 144 Syndrome.

Table 2. Riding ability category definitions, median percentage of clients in each category, IQR, and n

Riding Ability Category	Description	Median Percentage of Clients	IQR	n
Very Limited	Unable to steer horse; frequent inappropriate pulling on horse's mouth/face; very little trunk and upper body support; travels primarily at the walk; requires one or more sidewalkers (someone walking beside the horse to support the rider)	20	10-44	225
Limited	Able to steer horse, but may occasionally inappropriately pull on horse's mouth/face; some trunk and upper body support; can cue horse with legs; travels primarily at the walk and trot; may require one sidewalker	25	15-40	223

Moderate	Able to steer horse with little inappropriate pulling on horse's mouth/face; good trunk and upper body support; can cue horse with legs; travels primarily at the walk and trot; may require one sidewalker	20	10-30	222
Moderately Advanced	Able to steer horse with no inappropriate pulling on horse's mouth/face; good trunk and upper body support; can cue horse with legs; travels primarily at the walk and trot; does not require a sidewalker	10	5-20	218
Advanced	Able to independently steer horse and cue with legs; excellent trunk and upper body support; can travel at the lope; does not require a sidewalker	2	0-10	220

145 3.3 Equine Health and Care

146 Programs provided the number of horses that had experienced a certain health issue in the previous
147 year. Responses were converted to the percentage of total horse population within each program by
148 dividing by the total number of horses provided in Question 17 of the demographics section. The top
149 health issues reported in THR horses were limb lameness (20%, IQR=6.9-30; n=211) and back soreness
150 (11.8%, IQR=0-25.3; n=208). Surprisingly, colic (0%, IQR=0-10, max. 27.3; n=212) and ulcers (0%, IQR=0-
151 0, max. 7.7; n=174) were minimally reported. The majority (75%, IQR=44.5-99.6; n=227) of horses were
152 barefoot and wore no shoes, 18% wore front shoes only (IQR=0-38.8; n=227), and very few wore front
153 and rear shoes (0%, IQR=0-7, max. 25; n=201).

154 The most common reason - other than a physical issue - horses were given time off from the program
155 was personality changes with no obvious cause (86.7%; n=240). Horses received NSAIDs for a lameness
156 issue (10%, IQR=0-20; n=224), chiropractic adjustment (5%, IQR=0-50; n=234), and massage (2%, IQR=0-
157 50; n=234) than any other supplemental care or complementary therapy. Glucosamine was minimally
158 reported (0%, IQR=0-18.75, max. 75; n=210). Staff performed horse health evaluations daily in 84.2%
159 and weekly in 12.9% of responses, while a veterinarian performed health evaluations monthly in 9.2%
160 and once/session in 37.1% of programs (n=240). Horses were most often housed on pasture when not in
161 use (50%, IQR=0-95; n=190).

162 3.4 Correlations between horse workload and reported injury

163 Correlations between various measures of horse workload in THR programs and the percentage of
164 horses with reported injury are shown in Table 3. Three correlations trended toward statistical
165 significance before adjustment for multiple comparisons, but were not significant after adjustment.

Table 3. Spearman's Rank correlations between horse workload and reported injury in therapeutic horseback riding programs

Relationship	n	r	p-value	Adj p-value*
1. Session length (wk) to % of horses w/ limb lameness	88	0.099	0.358	0.830

2. Session length (wk) to % of horses w/ back soreness	88	0.038	0.724	0.924
3. Lesson length (min) to % of horses w/ limb lameness	109	-0.080	0.409	0.830
4. Lesson length (min) to % of horses w/ back soreness	106	0.115	0.240	0.808
5. Total ride hr/wk to % of horses w/ limb lameness	190	0.106	0.147	0.719
6. Total ride hr/wk to % of horses w/ back soreness	184	0.185	0.011	0.129
7. Ride hr/d to % of horses w/ limb lameness	196	-0.023	0.746	0.924
8. Ride hr/d to % of horses w/ back soreness	196	0.096	0.184	0.759
9. Ride d/wk to % of horses w/ limb lameness	209	0.159	0.022	0.214
10. Ride d/wk to % of horses w/back soreness	206	0.108	0.123	0.693
11. Length in program (yr) to % of horses w/ limb lameness	171	-0.084	0.247	0.808
12. Length in program (yr) to % of horses w/ back soreness	168	-0.169	0.029	0.254

* Šidák adjusted for multiple comparisons

166

167 Discussion

168 The information reported here is the first known report of equine demographics and horse workloads in
 169 THR programs. These responses provide basic information characterizing the surveyed programs;
 170 however, only limited conclusions can be drawn as reasons for some responses were not collected.

171 4.1 Equine Demographics

172 Equine operations have been defined by the United States Animal and Plant Health Inspection Service
 173 (APHIS) as small (5-9 equids), medium (10-19 equids), or large (20+ equids) [13]. Based on those
 174 definitions, THR programs were typically medium sized with a median of 10 equids/program. Equine
 175 demographics within the variety of disciplines in the equine industry are difficult to acquire. State-level
 176 surveys have reported equine numbers, breeds, and use, but do not often report age or gender [14,15].
 177 This survey showed the number of mares (33.3%) and geldings (66.7%) used in THR programs were
 178 different as compared to the number of each gender reported nationally (48.6% and 39.9%,
 179 respectively) [13]. Also, there were more geldings reported in university programs [11]. This may be due
 180 to the perception of equine gender behavior; geldings are perceived to be more calm, reliable, and easy-
 181 going than stallions or mares [16]. Stock-type horses are common and popular in the United States and
 182 accounted for 53.2 ± 2.6% of horses in the United States [13]. In this survey, American Quarter Horses,
 183 Paints, and other stock-type horses were grouped and accounted for 53.1% of equids used in THR
 184 programs.

185 Relative to age, APHIS used birth to 6 months (4.3%), 6 months to 5 years (18.6%), 5 to 20 years (65.6%),
 186 and 20+ years (11.4%) to categorize horse age groups [17]. For THR programs, the majority of horses
 187 (33.3%) were aged 16 to 20 years. When data for THR horses from 5 to 20 years are combined, the

188 number is similar to that reported previously (62.2% and 65.6%, respectively) [17]. The majority of
189 horses (75.6%) used in university programs were also 5 to 20 years [11]. APHIS reported the number of
190 older horses increased by 3.8% between 2005 and 2015 [17]. This increase in the number of older
191 horses nation-wide may be related to why the second greatest age group of THR horses was 20+ years
192 (25.0%).

193 4.2 General Program Responses

194 Equine workload has been defined previously based on time ridden and type of activity [18]. In THR
195 programs, horses were typically ridden by clients 9 hours/week which would equate to a heavy
196 workload based on time (4-5 hours/week) [18]. However, THR horses primarily exercised at a walk (80%
197 of time spent), which would equate to a light workload (recreational riding, beginning training,
198 occasional showing) [18]. Many respondents also indicated that horses were ridden 1-4 times each week
199 by more experienced riders. The amount of time or type of activity this required of the horse was not
200 explained, but does imply the workload of THR horses was higher than that reported in Question 2. This
201 illuminates the difficulty in defining “workload” across equestrian disciplines when attempting to define
202 a common standard of care.

203 Tracking animal use is important when considering equine welfare. In university programs, animal use
204 was reported on a daily basis using either written (73.8%) or verbal (57.8%) communication [11]. This is
205 compared to THR programs, which used written only (58.9%) or verbal only (4.6%) methods on a daily
206 basis, while 13.7% used both. In both situations, written communication was more often used to track
207 horse use.

208 The most common way THR programs acquired horses was through donation. This is compared to
209 horses in university programs, where 57.9% (n=11/19) of programs acquired 90% or more of their
210 horses through donations, and 78.5% (n=15/19) of programs acquired 50% or more of their horses
211 through donations [11]. Horses remained in THR programs for 7 years whereas university programs
212 generally kept horses less than 10 yr, with 44.4% of horses remaining in a program for less than 5 years
213 and 44.4% remaining for 6 to 10 years [11]. Although the question was not asked in either survey, lack of
214 funding to purchase new animals in one university program has been reported [19]. Donations were the
215 primary means of animal acquisition in both THR and university programs, so the same funding issue
216 may be present in THR programs.

217 While there have been many reports on the benefits of THR on human riders, this is the first known data
218 collected on the percentages of client riding ability and disability group. Based on question limitations,
219 no conclusions or comparisons related to horse use or health can be drawn at this time.

220 4.3 Equine Health and Care

221 A variety of management issues should be considered when caring for horses. Relative to hoof care,
222 horses can be maintained barefoot or wear shoes on both front hooves, both rear hooves, or on all four.
223 In university programs, only 34.2% of horses were barefoot [11] as compared to 75% in THR programs.
224 Also, while few THR horses wore both front and rear shoes, 43.6% of university horses did the same.
225 One THR respondent noted that horses were not allowed to wear rear shoes; this is not specified in
226 PATH Intl.’s standards manual [10], so it is assumed this was a program rule. Horses were housed in

227 stalls more often than on pasture in university programs [11], whereas THR programs housed horses on
228 pasture more often than in stalls.

229 In this survey, the identity of the respondent for a given THR program is unknown. Therefore, reported
230 health related issues may not have been verified by a licensed veterinarian. In university programs,
231 horses were most often checked by faculty or staff on a daily basis (52.6%) and by veterinarians as
232 needed (66.7%) [11]. The majority of respondents in the THR survey indicated horse health evaluations
233 were performed by staff daily (84.2%) and only 9.4% indicated a veterinarian performed evaluations
234 monthly. Many respondents reported routine veterinarian visits coincided with spring and fall
235 vaccinations. With this in mind, THR horses experienced a lower incidence of limb lameness (20% vs.
236 29.7%), colic (0% vs. 16.5%), and hoof abscesses (0% vs. 17.0%), but a higher incidence of back soreness
237 (11.8% vs. 4.8%) in the previous year as compared to other national reports [20,21].

238 Many nutritional supplements and complementary therapies are available for horses. Nationally, the
239 most common supplements and treatments used in horses included corticosteroid and other joint
240 injections ($21.2 \pm 5.2\%$), nutritional or joint supplements ($29.2 \pm 3.7\%$), chiropractic adjustments ($17.2 \pm$
241 3.2%), and massage ($10.4 \pm 2.2\%$) [20]. In university programs, glucosamine was used in 7.0% of horses,
242 and common therapies included joint injections (18.3%), chiropractic adjustments (5.0%), and massage
243 (2.8%) [11]. The most common supplement or treatment received by THR horses was NSAIDs for a
244 lameness issue (10%) followed by chiropractic adjustment (5%) and massage (2%).

245 There were no published surveys found that explored how it would be determined if or when a horse
246 needed time off from regular work for a non-physical issue. In this survey, THR programs depended on
247 horse handlers or barn managers to recognize the symptoms of burn-out. From the choices offered, the
248 most common reason horses were given time off was due to an unexplained change in behavior. Some
249 programs reported increasing incidents of spooking or shying as reasons for giving a horse time off.

250 Conclusions

251 It is acknowledged that there were some ambiguous and confusing responses collected for this pilot
252 survey. Future surveys should consider revising the questions to generate more precise data (Table 4).

Table 4. Question revisions recommended by authors for future surveys

Question	Recommended Change(s)
1	Edit to read, "Do you offer riding in sessions (defined as a group of rides over a period of weeks)?" Add, "If yes, how long is a session?"
New	Create question, "How long is the average lesion length (defined as the length of time spent during one ride)?"
4	Specify to enter minutes
8	Edit to read, "What is the most common reason horses leave your program after any trial period?"
9	In ability descriptions, replace 'pulling on horse's mouth' with 'pulling on horse's mouth or head with reins'
10	Add a choice with Attention Disorders (ADHD, ADD)
13	Edit to read, "How do you determine if horses need time off from the program for reasons other than a physical issue?"
15	Add 'Once per year by Veterinarian' and 'Twice per year by Veterinarian' as choices

- 16 Remove 'Once per session by Veterinarian' as a choice
Edit to read, "How are horses primarily housed when not working?"
Change question type to choose one and not enter percentage
- 19 Provide breed examples with each breed category option
-

253

254 Based on data gathered in this survey, it can be concluded that THR horses were not worked excessively.
255 They were ridden less than PATH Intl.'s maximum recommendation of 6 hours/day (ridden 2 hours/day
256 in this survey) and 6 days/week (used 4 days/week in this survey) [10]. They were ridden similarly to
257 those in university programs, where horses were ridden 7 hours/week and used 4 days/week
258 (approximately 1.8 hours/day that they were ridden) [11]. Horses in THR programs also appeared to
259 have fewer reported health issues in most categories as compared with data in other national reports.
260 This reflects positively on horse use and care in these programs.

261

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265

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