

2 **Table 3: The significant input variables explaining the data derived from behavioural observations and the response to an approaching observer made**
3 **during up to 475 observations of tethered horses and 587 observations of free ranging horses. Blank cells indicate the input variable was not**
4 **significant in the model.**

Output variable		Odds ratio of input variables (boundaries of 95% confidence interval)																
		Intercept	Free-ranging (not tethered)	Temperature (C) during observation	Sun (shadow present during observation)	Rain during observation	Wind >f5 during observation	Time of day	Female	Age <2.5 years (dental assessment)	Cob type breed	Number of days since the first observation of an individual horse	Number of days since the last observation of an individual horse	Observation number for an individual horse	Any type of supplementary feed present	Wet ground present	Muddy ground present	
10 minute behavioural observations, scan samples every 30 seconds	Standing alert	0.96 (0.92-0.99)	0.33 (0.24-0.47)	0.93 (0.90-0.97)														
	Standing swishing	0.71 (0.66-0.76)		1.14 (1.07-1.22)	1.85 (1.14-2.98)	0.19 (0.07-0.57)			1.87 (1.07-3.28)									
	Eat (not graze)	0.81 (0.79-0.83)			0.25 (0.12-0.54)				0.30 (0.09-0.97)						20.95 (2.36-185.94)			
	Other friendly interactions	0.76 (0.74-0.77)							3.74 (1.46-9.53)									
	Antagonistic social interaction	0.76 (0.71-0.79)						0.98 (0.97-1.00)										
	Walk	0.85 (0.84-0.86)	2.75 (2.15-3.53)						1.62 (1.15-2.28)									
	Trot	0.72 (0.69-0.76)	3.70 (1.26-10.83)															
	Canter	0.69 (0.64-0.74)	6.89 (1.35-35.12)															
	Drink	0.68 (0.63-0.73)	19.11 (2.87-127.14)															
	Graze	1.02 (1.00-1.04)			0.72 (0.59-0.87)									1.03 (1.01-1.05)				
Lying	0.90 (0.88-0.92)						0.48 (0.31-0.74)		2.35 (1.12-4.95)				0.95 (0.93-0.96)		0.20 (0.13-0.30)			
Standing not alert	0.96 (0.95-0.98)		0.96 (0.94-0.97)	1.47 (1.34-1.60)	0.66 (0.57-0.76)	0.35 (0.25-0.49)			0.49 (0.29-0.83)			0.99 (0.99-1.00)	1.02 (1.01-1.03)				1.91 (1.58-2.31)	
Response to approaching observer	Move head/ body towards approaching observer	1.01 (0.98-1.04)	0.33 (0.16-0.7)												0.62 (0.47-0.83)			
	Move head/ body away from approaching observer	0.95 (0.93-0.98)	2.83 (1.93-4.14)												2.07 (1.70-2.57)			
	Ears track approaching observer	1.03 (1.01-1.06)	0.51 (0.34-0.77)						1.88 (1.20-2.93)			1.01 (1.01-1.02)			5.93 (5.66-9.60)			
	Move head/ body towards observer attempting chin contact	0.99 (0.97-1.01)	2.23 (1.49-3.31)			1.36 (1.23-1.50)	0.77 (0.63-0.94)								1.28 (1.03-1.58)			
	Move head/ body away from observer attempting chin contact	0.97 (0.94-1.01)			1.28 (1.20-1.37)		2.32 (1.91-2.82)			0.53 (0.33-0.85)								
	Able to touch horse	1.01 (0.97-1.04)	0.47 (0.39-0.56)							0.56 (0.38-0.82)								
										1.98 (1.23-3.18)								

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9 **Table 4: The input variables explaining the normal behavioural output variables and the significant quantitative behavioural variables explaining the**
 10 **PCA components derived from the same 10 minute observation made during up to 475 observations of tethered horses and 587 observations of free**
 11 **ranging horses. Blank cells indicate the input variable was not significant in the model.**

Output variable (derived from a 10 minute behavioural observation)	Parameter estimates (standard error) of the effect of significant input variables								The parameter estimates (standard error) of the significant quantitative behaviour observation input variables that relate to the PCA components derived from a qualitative behavioural assessment								
	Intercept	Free-ranging (not tethered)	Age <2.5 years (dental assessment)	Temperature (C) during observation	Sun (shadow present during observation)	Rain during observation	Wind >f5 during observation	Observation number (how many times that horse had been observed in total at that observation)	Intercept	Standing alert	Standing not alert	Walk	Trot	Lying	Other friendly interactions	Antagonistic social interactions	Self-groom
Number of bouts of playfulness	0.001 (0.001)		0.077 (0.032)														
Number of vocalisations	0.014 (0.002)	-0.251 (0.062)					0.909 (0.250)										
PCA component 1 (arousal)	0.003 (0.007)		0.354 (0.103)				0.413 (0.178)		-0.005 (0.006)	0.099 (0.008)	-0.023 (0.005)	0.099 (0.011)	0.229 (0.035)	-0.031 (0.005)	0.141 (0.031)	0.491 (0.132)	-0.124 (0.049)
PCA component 2 (mood)	-0.108 (0.01)	1.38 (0.173)		0.064 (0.007)		-0.388 (0.075)	0.642 (0.143)	0.041 (0.006)	-0.011 (0.013)		-0.017 (0.005)						

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14 **Table 5: The significant input variables explaining the data derived from physical health assessments made during up to 475 observations of tethered**
 15 **horses and 587 observations of free ranging horses. Blank cells indicate the input variable was not significant in the model.**

Output variable (physical health assessments)	Odds ratio of input variables (95% confidence interval)																			
	Intercept	Free-ranging	Temperature (C) during observation	Sun (shadow present during observation)	Rain during observation	Wind >5 during observation	Time of day	Female	Age <2.5 years (dental assessment)	Cob type breed	Welsh pony	Number of days since the first observation of an individual horse	Distance from horse on approach (closest distance achieved)	Observation number for an individual horse	Supplementary vegetables present during observation	Muddy ground present	Firm ground	Typical grass length	Dirt on the body	Dirt on the limb(s)
Eye abnormality	1.00 (0.96-1.04)	0.14 (0.08-0.24)			0.72 (0.65-0.81)								0.86 (0.83-0.89)	1.10 (1.09-1.12)						
Lesion on the body (>2cm diameter)	0.90 (0.89-0.92)			0.81 (0.33-2.00)		0.36 (0.28-0.47)							0.83 (0.79-0.87)	1.12 (1.10-1.13)					0.37 (0.27-0.50)	
Thin (bcs<2.5)	1.04 (1.00-1.09)	3.58 (2.28-5.62)	0.90 (0.88-0.92)	0.88 (0.80-0.98)								0.97 (0.97-0.97)			0.31 (0.17-0.59)			0.91 (0.87-0.95)		
Fat (bcs>3.5)	0.77 (0.73-0.80)		1.17 (1.14-1.19)	0.58 (0.52-0.66)				0.18 (0.04-0.84)				1.01 (1.01-1.01)								
Vertical hoof crack from the bottom >1cm length	0.93 (0.89-0.97)	0.50 (0.26-0.97)														0.53 (0.34-0.84)		0.95 (0.91-0.99)		
Abnormal hoof conformation	0.88 (0.86-0.91)				0.50 (0.38-0.67)													0.88 (0.82-0.95)		
Abnormal hoof pastern axis	0.86 (0.81-0.92)	0.11 (0.03-0.37)	1.04 (1.02-1.07)	1.76 (1.50-2.06)																2.66 (1.65-4.29)
Hoof horn rings	0.79 (0.76-0.83)				3.22 (2.39-4.34)													1.14 (1.04-1.24)		3.11 (2.03-4.76)
Dirt on the limb(s)	0.83 (0.78-0.89)	40.81 (14.02-118.77)	0.96 (0.93-0.99)	2.26 (1.92-2.67)		3.40 (1.58-7.32)						1.02 (1.02-1.02)				3.94 (1.86-11.37)	0.03 (0.02-0.05)			
Dirt on the body	0.86 (0.81-0.90)	4.29 (2.15-8.58)		1.62 (1.30-2.01)	3.68 (2.85-4.76)		0.40 (0.17-0.97)	0.17 (0.05-0.65)	4.01 (1.53-10.81)							3.30 (2.42-4.31)	0.18 (0.13-0.26)			
Poor coat condition	0.91 (0.88-0.94)				0.57 (0.45-0.72)								0.98 (0.98-0.98)							
Moulting	0.95 (0.92-0.97)			1.34 (1.21-1.44)				2.08 (1.14-3.78)					0.97 (0.97-0.97)							
Moulting tags present	0.99 (0.92-1.08)			1.24 (1.02-1.51)									0.96 (0.95-0.96)							
Mane or tail tangles	0.91 (0.89-0.94)	1.85 (1.26-2.71)	1.08 (1.07-1.09)								2.03 (1.23-3.34)									
Ectoparasites	0.78 (0.72-0.85)		1.15 (1.11-1.20)		9.05 (6.60-12.41)								0.31 (0.18-0.54)							
Lameness (obvious nod at walk)	0.82 (0.76-0.89)	0.05 (0.01-0.29)	1.14 (1.10-1.17)										0.52 (0.40-0.67)	0.81 (0.78-0.84)						
Signs of limb pain (weight shifting or toe pointing)	0.75 (0.67-0.83)	0.05 (0.00-0.57)	1.21 (1.17-1.25)										0.47 (0.35-0.63)	0.94 (0.91-0.97)						