



A preliminary study investigating the effect of rug-wearing on measured stride length in horses

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KEY MESSAGES

- Wearing rugs decreases horses’ walk stride length, indicating a potential effect on horses’ musculoskeletal system.
- Layering 2 rugs over a period of 28 days significantly decreases the horses’ walk stride length to a greater extent than wearing only 1 rug for the same period.
- Understanding the effects of layering rugs and types of rugs on horses’ musculoskeletal system is important for performance and welfare issues.

INTRODUCTION

The use of equine rugs is common practise in colder climates to assist thermoregulation.

Layering rugs in the stable for warmth is anecdotally common practise (Clayton et al, 2010).

Layering of clothing has shown to produce restrictions in human movement, limiting joint angles and causing participants to alter motion strategy (Rahmatalla et al, 2005).

Study aim: to investigate the effect of rug-wearing on measured walk stride length and rug-layering over a 28-day period.

METHODOLOGY

- Riding School horses(n=12), stabled or loose housed from the same yard were selected; 8 geldings and 4 mares, mean ± s.d. (range) age:10.9 +/- 2.91 (5-15)years, height: 152.5 +/- 16.15 (127-175)cm, with no known existing conditions.
- Horses divided into two evenly matched groups. Group 1(n=6) wore 1 x 200g rug for four weeks; group 2(n=6) wore 2 x 100g rugs for four weeks. Rugs were taken off only for ridden or walker exercise, and stabled horses wore a different rug for paddock turnout of one hour per day.
- A digital video camera recorded each horse walk a straight 10m length track in an indoor school at the start and end of a 28-day period. Each walk consisted of 4 passes (2 from right, 2 from left) under three conditions: no rug, 1x 200g rug and 2 x 100g rugs.
- Markers were placed laterally on the coronet band of each hoof, hair clipped 1cm square for repeatability. Kinovea software measured 5 stride lengths for each limb per condition per horse (n=20).
- Data tested for normality (skewness test) and variance (ANOVA-2 factor without replication) with post-hoc paired T-Tests Statistical significance $P < 0.05$.

RESULTS

Table 1 (below) and Figure 1 (right): Horse stride length (cm) (mean ± s.d.) (n=12) for all horses at each walk condition at Day 0 and Day 28

Walk condition all horses (n=12)		No rug	1 rug	2 rugs
	Day 0	204 ± 29.7 ^{AC}	202 ± 28.8 ^{AB}	199 ± 28.7 ^{ABC}
	Day 28	200 ± 26.0 ^{AB}	198 ± 26.7 ^A	197 ± 26.5 ^B

Significant differences between mean values within each row above are indicated^{ABC} ($P < 0.001$)

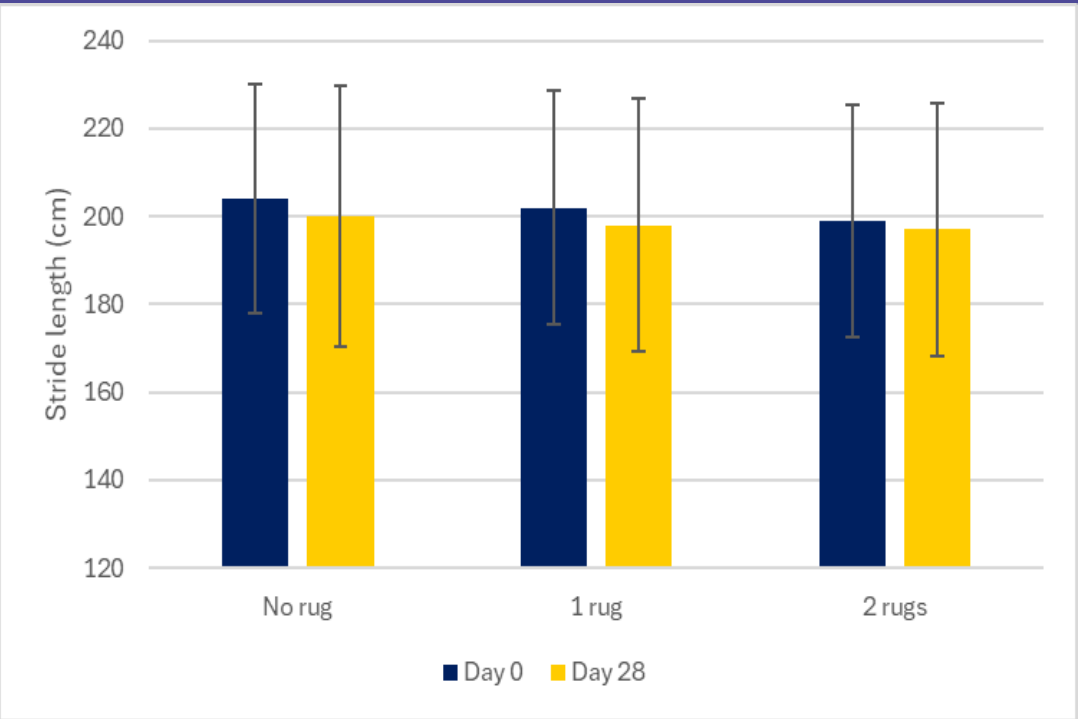


Table 2: Horse stride length (cm) (mean ± s.d.) for each Group (n=6) at each walk condition at day 0 and day 28

Groups (n=6)	Walk condition					
	No rug		1 rug		2 rugs	
Group 1 (1 x 200g rug for 28 days)	Day 0: 199 ± 29.2	P > 0.05	Day 0: 197 ± 27.0	P > 0.05	Day 0: 194 ± 26.4	P > 0.05
	Day 28:199 ± 26.7		Day 28:196 ± 26.6		Day 28:195 ± 27.2	
Group 2 (2 x 100g rugs for 28 days)	Day 0: 209 ± 29.9	P < 0.0001	Day 0: 207 ± 30.2	P < 0.0001	day 0: 204 ± 30.4	P < 0.0001
	Day 28:201 ± 26.0		Day 28:200 ± 27.3		Day 28:199 ± 26.2	

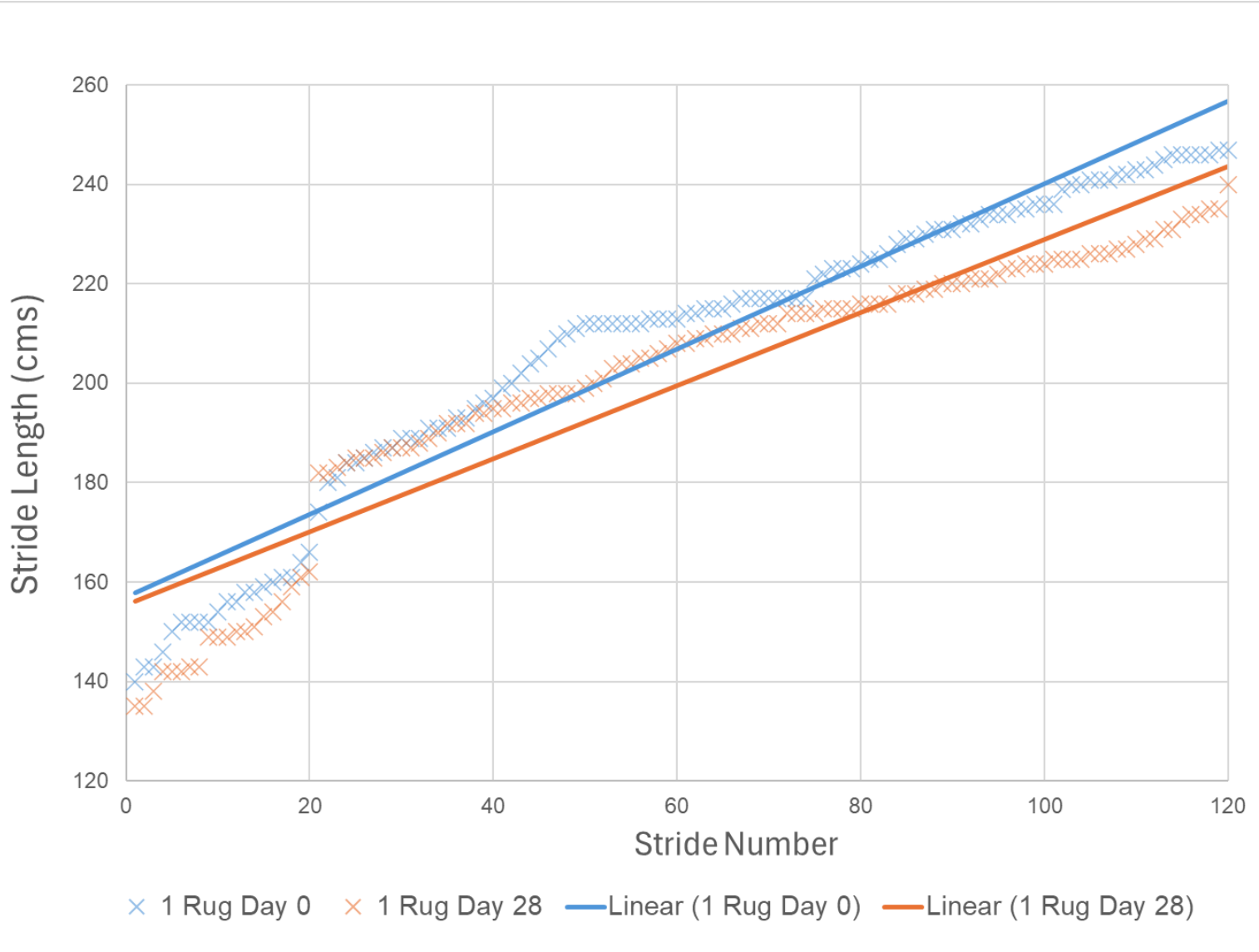


Figure 2. Scattergraph of Group 2 (2 x 100g rugs): horses’ walk stride lengths when wearing 1 rug from Day 0 and Day 28

CONCLUSIONS

- The number of rugs worn significantly affects walk stride length ($P<0.001$).
- Stride length decreases as the number of rugs increases.
- Wearing one rug (1x200g) daily over a 28-day period, does not significantly reduce stride length compared to day 0 ($P>0.05$).
- Wearing two rugs (2x100g) over a 28-day period significantly reduces stride length ($P<0.0001$) whether walking with no rug, one rug or two rugs.

