

Difference and relationship in length of the ‘mean’ canter stride of a horse and the intermediate strides within a two stride double fence combination

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Hole et al (2001) showed the intermediate jumping strides of elite horses between two stride double fence combinations differed considerably, i.e. the first intermediate stride was longer than the second; although conducted at the same velocity. The aim of this study was to determine whether the mean length of a standard canter stride had any relationship with the intermediate jumping strides in non elite horses as this may have implications for course design and training. The study also sought to find out if there was a significant difference between the lengths of the two intermediate strides in this group as has been shown in elite horses. A random selection of horse and rider pairings ($n=6$) were selected with horses aged between 8-20 years, heights between 155 cm and 164 cm. They were all capable of jumping the required combination. A double fence combination of 80 cm uprights was set up, 10 m apart within an indoor school. The distance was recommended to the researcher by a BS course builder and the combination was positioned on the long side of the school. The riders were asked to canter down the long side of the school on the left rein and jump through the combination three times. This was filmed using a Sports Motion Gait Analysis camera to determine stride length and define a mean of the attempts with the take-off and two intermediate strides measured. Using MS Excel the results showed that there was a significant difference between the standard canter stride and the intermediate jumping strides (ANOVA $p<0.001$). It was also found that there was a significant difference between the two intermediate jumping strides ($p=0.03$) with the second stride being shorter than the first (1st stride mean = 4.12m; range 3.67-4.63m : 2nd stride mean = 3.81m; range 3.44-4.29). This suggests the horse's stride lengthens considerably in the jumping phase of show jumping activities compared to a normal canter possibly causing issues relating to judging distances. The horses showed different intermediate stride lengths; however, all making up the set distance in the combination through landing and take-off stride changes. This suggests that the same adaptation in stride changes occurs in elite and non-elite horses, which has possible implications for course design at all levels, novice built jumping exercises and the training of riders when learning to jump.

References:

Hole, S. L., Clayton, H. M., Lanovaz, J. L., (2002). A note on the linear and temporal stride kinematics of Olympic show jumping horses between two fences. *Journal of Applied Animal Behavioural Science*. 75 pp317-323