GROUND REACTION FORCES EXPERIENCED BY AGILITY DOGS OVER DIFFERENT JUMP WIDTHS

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Introduction

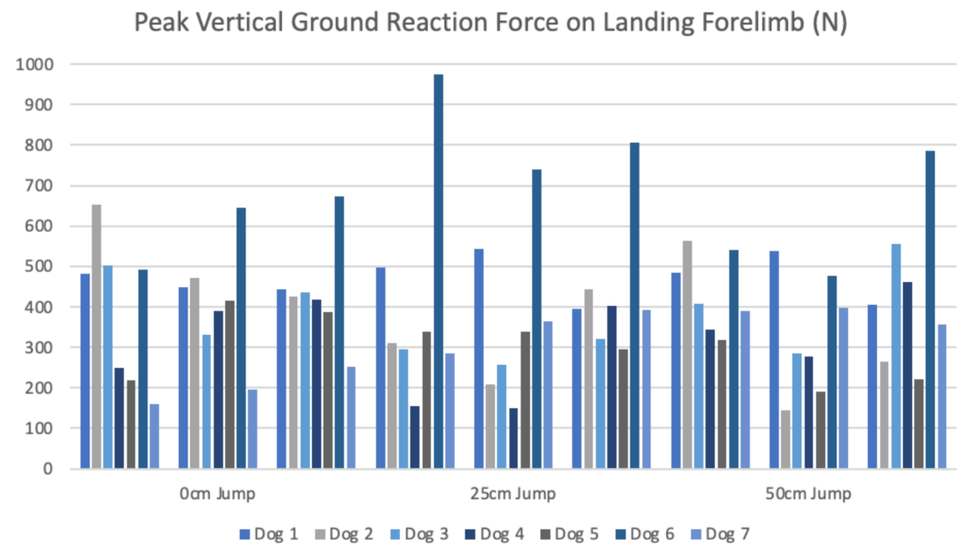
Dog agility is a timed obstacle course for a dog to run while being guided by their handler. Courses include jumps, tunnels, and ramps which test a dog's fitness and training and the owner's ability to direct their dog. This requires advanced mental and physical capabilities from the dog including bursts of energy and quick direction changes. Jumping is a large part of agility competitions and the force on a dog's limbs during landing is one of the main causes of injury to agility dogs. Research by Pogue, Zink, and Kieves (2022), Birch and Lesniak (2013), and Pfau et al. (2011) evaluated how the height of a jump can affect the landing force on a dog's limbs and the angle of the joints as they land, but there is less research on the effect of the width of the jump. The aim of this study was to investigate how altering the jump width can affect the peak ground reaction forces agility dogs experience on their forelimbs when landing.

Methods

A sample of seven large agility dogs completed three different jump widths, 0cm, 25cm, and 50cm, three times each, landing on a pressure plate to measure the force on landing. Only large agility dogs that regularly took part in agility, were fit, healthy and between the ages of two and eight were included within the study. Any dogs with musculoskeletal pathologies and brachycephalic breeds were excluded from the study. The peak forces were divided by the dog's weight before using SPSS to analyse the data. The Spearman's Rho test was used to determine any correlation within the data.

Results

This study indicated there was no strong correlation between the force per kilogram on the landing forelimbs between any of the groups ($r<0.5$) except between the groups of '25cm Jump Landing Forelimb' and '50cm Jump Landing Forelimb' ($r_s(21) = .604$, $p = .004$).



Discussion/Conclusion

Results from this study indicate that there is no correlation between width of the jump and the force per kilogram on the forelimb on landing of large agility dogs.

These results could be applied to the agility industry by justifying the Kennel Club guidelines as appropriate for course and obstacle design. Results show that a large agility dog can jump a 50cm width without increasing the force on their limbs any more than a normal single hurdle, suggesting that these dogs can jump up to these widths without serious damage. For this research to be applied fully to help improve course design there needs to be further research to consider the impact angle, height of the jump, speed of agility dogs over different obstacles, on different surfaces and how each of these factors can affect the forces on dogs' limbs.

References

Birch, E. and Lesniak, K. (2013) 'Effect of fence height on joint angles of agility dogs', The Veterinary Journal, 198(1), pp. 99-102. Available at: http://dx.doi.org/10.1016/j.tvjl.2013.09.041

Pfau, T. et al. (2011) 'Kinetics of jump landing in agility dogs', The Veterinary Journal, 190(2), pp. 278-283. Available at: https://doi.org/10.1016/j.tvjl.2010.10.008

Pogue, J., Zink, C., and Kieves, N. (2022) 'Effects of jump height on forelimb forces in Border Collies', Frontiers in veterinary Science, 9(1), pp. 1-8. Available at: https://doi.org/10.3389/fvets.2022.1006990