

Note to the Agility Liaison Council

AHWSG Progress Report – May 2016

Mr Paul McPherson, an ophthalmic vet based in Southwell, Notts attended as a guest at the January meeting with a view to joining the group.

Funding for Research Projects

Due mainly to the efforts of Mr S Croxford the General Committee have approved a sum of £35,000 to be ring fenced for research into Activities. The Sub-Group will put forward suitable projects for approval by the Kennel Club Charitable Trust.

Research Issues

Future areas of research were discussed and the following were particularly highlighted:

- Investigation of jumping speeds and how they are affected by differing jump heights and distances
- Analysis of forces on a dog turning after a jump
- Long jump in agility
- Rapid deceleration to a stop after negotiating obstacles in Working Trials and in particular:
 - Long jump in Working Trials (noting that data could not be extrapolated from the results of research into the long jump in agility as there were differences between the two disciplines)
 - Scale in Working Trials. The Working Trials Liaison Council was to be requested to provide specific details of what issues were to be investigated and how the research should be framed

Numbers of Participants

Input was received from each Activities discipline as to the number of competitors over a typical weekend. These numbers will help put into perspective the numbers of competitors versus injuries reported.

KC Guidelines for the Management & Training of Dogs Taking Part in Canine Activities

The General Committee have approved the document and it is available on the Kennel Club website. A Press Release will be issued to inform competitors.

Jumping Kinetics and Kinematics Study

The analysis of kinematic data produced is still being carried out by Dr Thilo Pfau at the Royal Veterinary College and an interim update report on the kinetic research is included as an Appendix to this report.

Collapsible Tunnel

A student of Dr Boyd's at Nottingham Trent University has conducted research into the safety of the collapsible tunnel and his dissertation has been passed on to the Equipment Panel to assist them in their consideration of this piece of equipment and the current concerns surrounding its use.

Dog Activity Injury Survey

This is a challenging task in ascertaining sufficient meaningful data due to relying on the good will of busy veterinarians. It is hoped that some of the specialists in canine sports related injuries may be able to help and there is the possibility of data from insurance companies.

Veterinary Assessments at Prestige Agility Events

The Sub-Group remains strongly in support of veterinary assessments taking place to ensure that the Kennel Club is perceived as taking a positive stance on the health and welfare of competing dogs. As a result, the Sub-Group has recommended that there should be a canine veterinary surgeon in attendance at all Prestige Events and as a minimum perform spot checks and that assessments would be carried out under the provisions of Regulation H14.

Canine Sports Science Seminar

The Canine Sports Science Seminar will take place on the 27th November 2016 in the Kennel Club building at Stoneleigh.

The office is currently in the process of confirming speakers.

Dave Jolly
Chairman, Activities Health & Welfare Sub Group

Appendix

Update Report for Research Funding Kennel Club Charitable Trust

Jumping Kinetics and Kinematics of Take Off and Landing - Agility Dogs

Thilo Pfau

11th January 2016

Part 1: Update Report January 2016

Data Collection (TP):

Nothing new to report. Data collection was successfully finished in April 2015.

Data analysis (TP):

Kinetic data:

Kinetic data have been analyzed and an abstract submitted to ICEL8 to be hosted at the RVC in August 2016. Below please find the submitted abstract which summarizes the findings with respect to forces and impulses experienced by the different groups of dogs (category 1: 'small' large dogs, <500mm height; category 2: 'large' large dogs, >500mm height) during take-off and landing when jumping over obstacles of 55 and 65cm height.

In summary, a linear mixed model with dog as random factor, jump height and dog height category as fixed factors and forces and impulses (normalized to bodyweight) as dependent parameters revealed:

- Effect of jump height:
 - increased vertical force at take-off and landing was found in the front limbs at 65cm height ($P < 0.047$)
 - **4.56x body weight** for combined front limbs at landing from **65cm** jump
 - **4.23x body weight** for combined front limbs at landing from **55cm** jump
 - **2.65x body weight** for combined front limbs at take-off for **65cm** jump
 - **2.84x body weight** for combined front limbs at take-off for **65cm** jump
 - higher decelerative force and impulse at take-off in the hind limbs for 65 cm height ($P \leq 0.031$)
 - **-0.44x body weight** for combined hind limbs at **55cm** height (force)
 - **-0.52x body weight** for combined hind limbs at **65cm** height (force)
 - **19.3% increase** in decelerative impulse over 65cm height
- Effect of dog height category:
 - The smaller dogs showed more decelerative force and impulse at take-off ($P \leq 0.048$).
 - **-0.57x body weight for smaller dogs** (braking force at take-off equal to 57% of body weight)
 - **-0.38x body weight for larger dogs** (braking force at take-off equal to 38% of body weight)
 - **40% less decelerative impulse for the larger dogs** compared to the smaller dogs

In summary it appears from the force data, that the main difference between the two height groups is to be found in the force in the horizontal plane and in particular how much the dogs need to decelerate at take-off. This is an important biomechanical factor to take into account, since acceleration and deceleration (in particular at high speed) are mechanically costly since they are related to large changes in forward kinetic energy. If the smaller dogs need to decelerate more (and hence likely accelerate more again after landing and before the crossing the next obstacle) this may be related to earlier fatigue. In addition, research in horses has shown that an important factor of the foot-surface interaction is the 'slippage' during the initial stance phase which is thought to contribute to a reduction in limb vibrations and a reduction in joint jarring. These results hence suggest that further studies

may be warranted into the influence of different surfaces on kinetics and kinematics of jumping.

Abstract submitted and accepted 'with minor corrections' to ICEL8:

The effect of jump height on forces and impulses during jump take-off and landing in large agility dogs

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¹The Royal Veterinary College, London, ²SmartVetWales, Swansea+Cardiff, ³University of East London, London

Reasons for performing study: In UK dog agility different jump heights are used for large dogs in UK agility (UKA) and Kennel Club (KC) competitions. The number of injuries in agility dogs related to jumping [1] might be related to high forces. **Objectives:** To quantify kinetics of take-off and landing for agility dogs jumping obstacles of 55cm (UKA) and 65cm (KC) height. **Study design:** Quantitative experimental study. **Methods:** 14 large agility dogs (N=7 <50cm withers height; N=7 >50cm) performed three successful repeats of two consecutive jumps set at either 55 or 65cm. Vertical and horizontal forces and impulses were recorded with 7 Kistler force platforms covered by artificial turf. Mixed models (P<0.05) were employed with dog as random factor, jump height and dog height category as fixed factors and forces and impulses (normalized to bodyweight) as dependent parameters. **Results:** Comparing 65cm obstacles to 55cm obstacles, increased vertical force at take-off and landing was found in the front limbs at 65cm height (4.6x respectively 4.2x body weight for combined front limbs at landing, P=0.047) and higher decelerative force and impulse at take-off in the hind limbs (P<=0.031). The smaller dogs showed 33 to 40% more decelerative force and impulse at take-off (P<=0.048). **Conclusions:** Compared to maximum speed bend running (up to 5 times bodyweight, [2]) jump landing elicits smaller vertical forces. Acceleration/deceleration is mechanically costly, hence the smaller dogs may show fatigue earlier. Further studies should hence investigate the relationship between fatigue and injury during jumping.

1. Cullen KL, Dickey JP, Bent LR, Thomason JJ, Moëns NM (2013) Internet-based survey of the nature and perceived causes of injury to dogs participating in agility training and competition events, J Am Vet Med Assoc, 243, 1010-1018
2. Usherwood J, Wilson A (2005) No force limit on greyhound sprint speed, Nature 438, 753-754

Ethical Animal Research: The study was approved by the Royal Veterinary College Ethics and Welfare committee. Informed owner consent was obtained for all animals used in the study. **Sources of funding:** Kennel Club Charitable Trust. **Competing interests:** None declared.

Kinematic data:

Data analysis in particular tracking of markers is ongoing. The focus in the first part of the study was on the kinetics.