Working Trials Research Proposal

Introduction

Working trials is dog sport which has three sections; nose work, control and agility. The obstacles in working trials are undertaken in a different manner to that which occurs in agility. Dogs in working trials jump a 3ft clear jump (always the first jump done), 8ft long jump and scale a 5ft6" scale. The handler may approach the clear and long jumps with the dog or send it forward or stand by the jumps and call the dog up to jump. Once the dog has cleared the clear or long jump, he should remain in a stationary position until joined by the handler. The dog may either stop completely after jumping the long, or may run on a pace or two before stopping. In respect of the scale, the handler and dog must approach the face of the scale at a walking pace with the dog at heel. Whilst the dog and handler are in a stationary position and the dog's front feet are within 9ft from the base of the scale, the dog is ordered to scale. The dog must then, while out of sight of their handler, return over the scale on command of the handler.

The dog jumps long and low over the long jump. The jump trajectory is higher for the clear jump and scale. Dogs should scale up the ascent side and scale down a portion of the descent side.

There is a dearth of biomechanical data related to working trials. One study has been conducted evaluating working trials obstacles[1,2,3]. This research evaluated kinematic or kinetic data on a surface which was different than that experienced by dogs training/competing in Working Trials. Therefore, there is a need to determine the kinetic and kinematic variables associated with working trials obstacles to develop the knowledge base in relation to this dog sport.

Aim & Hypotheses

The aim of this research is to quantify kinetic and kinematic parameters during landing for the obstacles traversed in working trials to conduct a risk-based analysis and ascertain if there are any concerning ground reaction forces or joint stress. The objectives of the study are to quantify the effect of jump type (clear vs. long jump vs scale) on kinetic and kinematic parameters. We hypothesise that: (1) the long jump will result in lower vertical ground reaction forces and greater craniocaudal forces compared to the clear jump or scale; (2) there will be no statistically significant difference in kinetic or kinematic variables between the 7ft and 8ft long jump; (3) the ground reaction forces (kinetic data) for the clear jump and scale will not be statistically significantly different; (4) a more acute landing angle will correlate with an increase in vertical peak force and degree of extension of all joints; (5) that

the data obtained will indicate less forces and joint stress is incurred during the working trials obstacles than that observed in agility studies. This is hypothesised to be due to the slower speed at which the obstacles in working trials are undertaken and the inversely proportional relationship between force and speed.

Methodology

The research methodology will be finalised by the selected research institution. However, it would follow the basic outline below.

- Ethical approval will be requested from the appropriate institution depending on the location of the research.
- Sample: A sample size large enough to produce statistically significant results would be required. This would be determined by the research institution based on a power analysis, to produce results which can be deemed statistically valid.
- Inclusion criteria: Dogs which are over 18 months of age, have competed in Working Trials competition having successfully completed the jumps with full marks, and have no history of orthopaedic or neurological injury or will have received a letter from a veterinarian to state that the problem resolved greater than 12 months ago, and since then, have successfully completed the scale and long jump in competition. A variety of breeds will be included.
- The study will be carried out on a surface which is equivalent to that experienced during working trials training and competition.
- The 3ft clear jump, 7ft and 8ft long jump and 5ft6" scale will be evaluated. The clear jump and the running dog or dogs jumping out of a car will be used as a reference points.
- Appropriate equipment will be used to measure the quantitative and qualitative data below. It is anticipated this will include a pressure pad, reflective markers on skeletal bony landmarks and video analysis whose use would be based on validated methods of analysis. This may also include the use of accelerometers if they have been validated for such use.
- Each dog will complete each obstacle by a standardised method a minimum number of times.
- Data will be collected for each dog related to age, sex, neuter/entire, orthopaedic/neurological veterinary history, weight, size, competition history.
- The following kinetic and kinematic quantitative data will be collated from each dog:
    - Kinetic data of the hindlimbs when ascending the scale.
    - Kinematic data at the cervico-thoracic junction, lumbosacral joint and hindlimbs when ascending the scale.
    - Kinetic data experienced by the forelimbs on landing from:

        - The scale
        - The long jump – 7ft
        - The long jump - 8ft
        - The clear jump
    - Kinematic data (joint angles) at the following joints when landing from the clear jump, the long jump (7ft and 8ft) and the scale:
        - Carpus
        - Glenohumeral joint
        - Spine – cervical, thoracic, lumbar, lumbosacral
    - Actual distance between take-off and landing for dogs jumping the 7ft and 8ft long jump.
- The following qualitative data would be obtained:
    - Method (style) of scale descent. It is proposed a score of 1-3 is given whereby 1=scaled to bottom half of the scale before jumping off; 2=scaled top half of scale before jumping off; 3=jumped from the top of the scale.
- Analysis would be carried out on the data collated to determine:
    - Kinetic data for each obstacle.
    - Kinematic data for each obstacle.
    - Similarities and differences for the variables between obstacles.
    - Similarities and differences between the 7ft and 8ft long jump.
    - Corelations between kinetic or kinematic values and the various methods of scale descent.
- Statistical Analysis methods will be determined by the research institution.

This finer detail of the methodology will be determined in liaison with the researchers from the chosen research institution. A University best suited to this type of biomechanical research based on an analysis of the quality of previously published research papers by the institution will be selected.

Conclusion

An abundance of studies exists in relation to agility dogs and have been used to inform rule changes and injury prevention in agility sports world-wide. It is not possible to directly extrapolate the findings in agility directly to the obstacles in Working Trials due to the significantly different nature of the obstacles. Nor can comparisons be made in relation to the impact forces experienced by WT versus agility dogs due to the nature of the surface used in the single WT study completed by Carter et al (2021).

As with studies conducted to examine injury prevention in other quadrupeds (agility canines and equines) accurate impact forces and joint stresses are necessary to inform the decision-making process to ensure that the health and welfare are foremost in the sport of Working Trials. The need for further research in this area is supported by the authors of both published WT studies[2,3]. Therefore, approval for a further study in relation to working trials, at a university which specialises in biomechanics, is requested to address this scientific knowledge gaps.

Ultimately the Research will be made public and presented to the KC & WTLC for their consideration.

References

1.Dr Anne Carter and Dr Ellen Williams
Investigating the impact of working dog trials obstacles on kinetics and kinematics of dogs
Unpublished Report

2.Williams E., Carter A., and Boyd J. (2021)
Kinetics and Kinematics of Working Trials Dogs: The Impact of Long Jump Length on Peak Vertical Landing Force and Joint Angulation
Animals, 11, 2804

3. Carter A, Boyd J and Williams E (2022)
Understanding the Impact of Scale Height on the Kinetics and Kinematics of Dogs in Working Trials
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