Kinematic analysis of the trot in CCI*** 3-day-event horses: a thesis presented in partial fulfilment of the requirements for the degree of Doctor of Philosophy at Massey University

Abstract
Three day eventing is an equestrian sport originally designed to test the capabilities of cavalry horses and riders. An integral component of the sport are the horse inspections to ensure the horse is fit and sound to continue from one phase to the next. This study examined the “in-hand” trot of horses presented at the first and third horses inspections during the CCI*** class at the 1995 New Zealand Horse Trials Championships, Taupo, New Zealand. This study involved five stages. 1. Quantification of the three day event inspection process by use of time motion analysis. 2. Examination of the linear and temporal characteristics of the trot event horses during the first inspection process. 3. Comparison of the temporal gait characteristics between the first and third horse inspections to determine the influence of dressage training. 4. Identification of variable points within each horses gait cycle that may change within and between inspections. 5. Exploration of the relationships between the horses gait cycle and the horses spatial positioning. The horses are presented to the inspectors in a straight line on a 30 x 60 m calibrating area which is long enough to allow the horses to accelerate and eventually maintain a constant speed for the duration of the inspection. This study was undertaken to investigate if there was evidence of dressage training when comparing the horses gait during the first and third horse inspections. A cross sectional study was made of the kinematics of 24 three day event horses during the first horse inspection. The horses were filmed using an applanatic camera at 200 frames per second. The horses were presented in random order across the inspection. The first and third horse inspections were quantified and temporal gait parameters recorded at each of the 6 weekly inspections. Temporal characteristics of the trot were defined. A cross sectional study was made of the kinematics of 24 three day event horses during the first horse inspection. The horses were filmed using an applanatic camera at 200 frames per second. The horses were presented in random order across the inspection. The first and third horse inspections were quantified and temporal gait parameters recorded at each of the 6 weekly inspections. Temporal characteristics of the trot were defined. A cross sectional study was made of the kinematics of 24 three day event horses during the first horse inspection. The horses were filmed using an applanatic camera at 200 frames per second. The horses were presented in random order across the inspection. The first and third horse inspections were quantified and temporal gait parameters recorded at each of the 6 weekly inspections. Temporal characteristics of the trot were defined.