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EPIDEMIOLOGICAL STUDIES OF EARLY
EXERCISE AND MEASURES OF TRAINING
AND RACING PERFORMANCE IN
THOROUGHBRED RACEHORSES

A thesis submitted in partial fulfilment
of the requirements for the degree of
Doctor of Philosophy
in
Veterinary Epidemiology

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ABSTRACT

This thesis includes a series of epidemiological studies conducted to quantify the exercise regimens of Thoroughbred yearlings during their sales preparation and 2- and 3-year-old race training. Additionally, this thesis aims to establish if there are associations between the exercise regimens and training and racing performance at two years of age.

Cross-sectional and cohort studies quantified the components of the exercise regimens used during sales preparation on stud farms in New Zealand. Exercise was a common practice during sales preparation. The type and amount of exercise was often tailored to individual horses. Overall, exercise varied by gender, the month of preparation, and between farms indicating that the exposure to exercise during sales preparation was not the same for all horses.

Survival analysis identified different horse and exercise risk factors for voluntary, involuntary, and musculoskeletal interruptions during training. Specifically, there were strong associations between increased total hand walking time and reduced chance of voluntary interruptions, and more time walking on a mechanical walker increased the risk of involuntary interruptions. Other horse and training factors, such as trainer, gender, age at the start of training, and the distance accumulated at canter and high speed, were associated with the time to interruptions during training.

Interruptions before the first trial were associated with an increased time to the first trial or race and a decreased chance of starting in a trial. Accumulating shorter distances and fewer events at high speed were both associated with a decreased chance of a trial or race start. Longer distances accumulated at high speed were associated with a decreased time to the first trial. No associations were found between the exercise accumulated during sales preparation and the time to the first trial during training. Overall, the exercise accumulated during sales preparation was associated with a measure of training performance, whilst the timing of interruptions and the accumulation of exercise during training have implications for reaching important training and racing milestones. The results of this thesis indicate that current exercise regimens could be modified to enhance the training and racing performance of Thoroughbred racehorses.
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LIST OF ABBREVIATIONS

12s  12s/200m
13s  13s/200m
15s  15s/200m
BMC Bone mineral content
CI  Confidence interval
CONDEX Pasture plus exercise
DMD Dorsometacarpal disease
GPS Global positioning systems
HR  Hazard ratio
IQR Interquartile range
LRS Likelihood ratio statistic
MSI Musculoskeletal injury
NH National Hunt
NZB New Zealand Bloodstock
NZTR New Zealand Thoroughbred Racing
OR Odds ratio
PASTEX Pasture with no additional exercise
RR Risk ratio
TAS Training activity score
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