

# Review of “Risk factors for musculoskeletal injuries of the lower limbs in Thoroughbred racehorses in New Zealand”

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## Why was this study done?

Musculoskeletal injuries are quite common among racehorses in training, with up to 90% of these injuries involving the forelimbs. Consequences may involve only a brief training setback, or can necessitate long-term treatment or even euthanasia. Various factors—track surface, age, gender, race distance, season, training intensity, nutrition, and a host of others—have been identified as being influential to some degree. More knowledge of injury risk factors and how to avoid them can limit discomfort to the horse and minimize the financial impact of lost training and racing time. The aim of this study was to investigate factors that influence risk of lower limb injuries to Thoroughbreds training and racing in New Zealand.

## How was the study conducted?

Data were collected monthly from 20 licensed Thoroughbred trainers in New Zealand over a period of 34 months. Each trainer had a separate premise, and all horses trained by a particular trainer stayed at that premise throughout their training. Questionnaires were used to gather information on training activity and injuries. Answers were obtained either during visits to trainers or by telephone interviews.

Training intensity was classified as 1) spelling (laid up or resting for seven or more days); 2) walk or trot; 3) activity up to but not exceeding canter, 4) fast work but no racing; and 5) started in at least one race since the last data collection.

A “training preparation” was defined as a period of time beginning when a horse entered or returned to work and ending when the horse was spelled (rested or laid up) for at least seven days, or left the study. Horses might have one or more training preparations during the study.

## **What results were found?**

Data reduction produced several populations. The first was made up of 459 horses that sustained lower limb injuries while in a preparation, and was called the Training dataset. The second was a subset made up of those horses that had started in at least one race during the preparation that ended with a musculoskeletal injury. This set was called the Starting dataset. Control sets were made up of all preparation periods for horses that did not sustain musculoskeletal injuries; there were 2181 non-injury Training preparations and 1639 non-injury Starting preparations.

Horses five years of age and older were at more risk of injury than were two-year-olds. Horses in their third or later preparation had a lower risk than horses in their first preparation. In the Training set, risk of injury was lower in preparations of longer than 20 weeks compared to shorter preparations. As to length of racing distance, increasing cumulative distances were first associated with a reduction in risk of injury, then leveled out, and then were associated with an increased risk of injury as distances continued to increase. There was also an increased risk of injury among horses for which trials made up more than 20% of starts. Trials are defined as training runs under racing conditions, usually against other horses, for the purpose of educating horses or riders or as a means of gaining preference to start in a public race. A significant variation of risk among different trainers was found.

## **What do the results tell us about the risk of injury to racehorses in training?**

Many factors influence lower limb injuries to racehorses as they begin and continue their training and racing careers. While it is difficult to evaluate the effect of any particular factor while excluding all others, the theory has been advanced that visible injury is often due to the accumulation of mild to moderate damage over time at a rate that exceeds the healing capacity of the affected tissues. This theory is supported by the conclusions of this study, in which more injuries occurred to older horses and those that raced at the longest distances. While injuries were fewer in those horses that spent the most time training between races, this could be due to a more gradual increase in work, allowing the horse to adapt to exercise and to heal minor injuries before they led to visible lameness.

The authors stated, "There was evidence to suggest that risk of specific injuries may be age-dependent, for example shin soreness in younger horses and tendon and ligament injuries in older horses. Age-associated risk may in part be due to loss of healing or adaptive capacity in musculoskeletal structures as horses age, a change that has been documented for tendons and ligaments."

Further study is indicated to provide more information on the relationship between exercise and injury, a relationship described by the authors as "complex and multi-modal." There is a need for improved methods aimed at detection, evaluation, and treatment of cumulative microdamage associated with the stress of repetitive exercise.

*The full text of this report can be found in the New Zealand Veterinary Journal 53 (3), pp. 171-183 (2005).*