StrathAyr Horse Health Discussion Document.

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Andrew F. Clarke

BVSc (Hons) PhD

My interest in the prevention of Racetrack Fatalities and Injuries dates back approximately 25 years from when I was based in the United Kingdom at the University of Bristol. Links that I established in the United Kingdom were maintained when I moved to Canada in early 1990's and it was from Canada that I worked on a project looking at racetrack fatalities with Sharon McKee for the British Horse Racing Industry.

On returning to Melbourne in 2000 as Chair of Equine Studies I was charged with developing a project to examine risk factors associated with racetrack fatalities for racehorses in Victoria. I was the principal investigator on a project entitled "Epidemiology and risk factor analysis of racetrack fatalities". The aim of the study was to identify risk factors associated with racetrack fatalities in Victoria. We put together an impressive team of researchers from Australia and overseas and Dr Lisa Boden joined the project as a PhD student. It was Lisa's hard work that was pivotal to the success of the project. The study included an ongoing study of post-mortem examinations of horses that died on the racecourse as well as a retrospective study of historical records of racetrack fatalities recorded in Victoria between 1989 and 2004 (Boden et al 2006). The data included recordings of track condition which is of particular relevance for StrathAyr. This data is reviewed later in this report.

The StrathAyr Turf System is in use in racing jurisdictions in Australia, Hong Kong and Singapore. Today these jurisdictions have some of the lowest rates of raceday fatalities and injuries of horses in the world. The rate of serious injuries in racing in Hong Kong where approximately 90% of races are run on StrathAyr-type turf tracks for example is approximately .18% of runners with approximately 3.5% of the population reported as suffering fractures and breakdowns during a single season (Osborne et al 2000). This compares favourably to an annual incidence of 9% of the racehorse population reported from Newmarket, England (Bathe, 1994). Fatality rates reported in Hong Kong where the StrathAyr system is in use are considerably lower than that recorded in other jurisdictions such as in North American where racing takes place on both dirt and turf tracks, with most racing occurring on dirt tracks (Mundy,1997). It should be noted that an American case-control study carried out in New York correlated a decreased risk of injury with racing on turf surfaces (Mohammed et al 1991). However, turf racing surfaces are not necessarily a panacea to lower the risks of injury and fatality in their own right. The quality of turf surfaces and associated rates of injury can vary with one study reporting total injury, catastrophic injury and non-catastrophic injury rates of 4.4, 1.3 and 3.1 per thousand starts respectively (Tan and Stewart, 2000). The turf track from which these rates were recorded was based at Bukit Timah in Singapore consisted of "cow grass grown on a layer of fine sand which was, in turn, on top of yellow earth". Comparative figures for Singapore with a StrathAyr track showed a decline in the overall injury rate to 2.9 per thousand starts with non-catastrophic injuries decreasing from 3.1 per thousand to 1.4 per thousand starts (Stewart, personal communication 2001, Appendix 1)

Care should always be taken in comparing rates of fatalities and injuries in different locations and attributing differences to one factor such as type of track surface alone. There are many other factors including pre-race medications, the design of the track itself and perhaps most importantly the hardness of the racing surface (Mundy, 1997). In this context the StrathAyr system provides the flexibility to maintain a consistency of surface for turf racing in the broadest range of weather conditions.

Fatalities apart wastage and attrition of horses due to musculoskeletal injuries is one of the biggest challenges facing the modern racing industry. This is the case with the rising value of all racehorses, especially horses performing at the highest level and the pending future shortages of horses especially associated with the present disruption of the breeding season with the outbreak of equine influenza in Australia. There can be nothing more discouraging for owners to learn of the early retirement of a talented horse because of a serious musculoskeletal injury. Hard and uneven racing and training surfaces are major risk factors for musculoskeletal injuries.

In relation to identifying risk factors for racing fatalities in flat racing the research in which I was involved collected data on over 280 fatalities and compared this data with over 3000 starters where no fatalities occurred for the time period between 1989 and 2004 (Boden et al 2006). The results of the study showed that there were increased odds of fatality for horses racing on fast or good tracks compared with those racing on heavy, slow or dead tracks. This finding is consistent with other studies in Victoria that have

shown increased likelihood of musculoskeletal injury on tracks with lower water content (Bailey *et al.* 1998).

Internationally track condition has been shown to be a significant risk factor of fatality or injury of racehorses during races (Rooney, 1982; Clanton *et al.* 1991; Wilson *et al.* 1996; Bailey *et al.* 1997; Williams *et al.* 2001; Parkin et al. 2005). However, care must be taken in making comparisons between different countries as track surface classifications vary substantially in different racing jurisdictions. In 2005, I acted as the convenor of a world's first international symposium on racetrack fatalities which brought together experts from racing jurisdictions in the USA, UK, Australia, Hong Kong and New Zealand. The symposium was entitled "Prevention of Thoroughbred racehorse fatalities and injuries" and eighteen papers, largely focusing on the epidemiology and prevention of racing fatalities, were presented over two days July 18th- July 19th2005.

One of the very clear take home messages from this symposium was that horses racing and training on firmer track surfaces have a price to pay in terms increased risks of musculoskeletal injury and fatality. There is also a human toll to consider. A jockey's health and well-being is placed at risk every time that a horse suffers a major injury. These types of injuries can lead to horses falling and the jockey is a risk from the impact of the fall and the rest of the field. A report of the symposium was published on the Equine Veterinary Journal website (Parkin, 2005:evj.co.uk/archive/downloads/11_05_Parkin_report.pdf). The Melbourne Symposium was followed up by a Havermeyer Foundation Workshop entitled

"Epidemiology of Training and Racing Injuries" (Parkin, 2007). This meeting identified exercise measurements, case definitions, time at risk, control selection, going or track rating as key issues for the future to have a significant impact on the prevalence of injury and fatality in the Thoroughbred.

Two British studies have demonstrated that the rate of injury of racing horses increases as track surfaces become firmer (Wilson *et al*. 1996; Parkin *et al.* 2004). As a result of the former study racing authorities in the UK mandated that wherever possible flat racing should not take place on firm or hard ground. Additional British research by Parkin *et al.* (2005) showed that good to firm and firm to hard tracks posed a greater risk to horses of lateral condylar fracture than did heavy, soft or good to soft tracks. The greater risk injury on a firm track is most likely due to greater ground resistance, with increased stress being placed on limb bones during repetitive loading (Clanton *et al.* 1991).

As highlighted above water content of the track is a key element in relation to track condition and the rates of fatality and injury sustained by horses racing and training on the track. Increased efforts should be made in track maintenance, especially with respect to maintaining the moisture content of the track surface during very dry periods. This is where the StrathAyr systems comes into its own as it has been shown that this system uses water more efficiently than traditionally prepared turf surfaces. Records provided by the Moonee Valley Racing Club show that the StrathAyr system consistently produces good racing surfaces. No fast or hard racing surfaces were recorded during the first 12 years of operation of the new StrathAyr track, a period which covered 354 race meetings.

77% of the tracks were rated as “good” and “dead” while 23% were rated as “slow” and “heavy”. These results have been mirrored in Singapore and Hong Kong with a lack of reports of hard racing surfaces.

From a veterinary perspective tracks using the StrathAyr system are some of the safest in the world today. Consistency of racing surface and the ability to avoid harder training and racing surfaces are critical management issues in minimising racetrack fatalities and injuries. Based on all of the above I would urge those considering the installation of turf racing surfaces to carefully consider the benefits provided by the SrathAyr system.

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APPENDIX 1.

Dr Brian Stewart, Chief Veterinary Surgeon
Singapore Turf Club 25 May 2001

"We have maintained statistics regarding our injury rate since moving to the Singapore Racecourse, at Kranji, in 1999.

We categorise our injuries as Catastrophic, which is revolves around breaking down and coming to the end of its racing career or having the horse put down.

We have non-Catastrophic, which is where the horse involved will recover with attention and treatment.

Our figures show that since beginning to race at Singapore Racecourse our Catastrophic is 1.4 per 1,000 starts.

When racing at Bukit Timah our Catastrophic injuries were 1.3 per 1,000, which is virtually the same, while our non-Catastrophic injuries were 3.1 per 1,000 starts, which was considerably higher.

We have compared our results and statistics with other studies conducted in Japan, North America and elsewhere and there is no doubt that the Singapore figures are good.

As a result we consider that the StrathAyr at Kranji is a very safe surface, with a very low injury rate and we are happy with the racetrack.

In fact we regard the StrathAyr as an excellent racing surface".

RACETRACK		Catastrophic	Non Catastrophic	Total
STC Kranji (2000-April 01)	Fibresand	1.2 per 1000 starts	1.7 per 1000 starts	2.9
	Turf	1.4 per 1000 starts	1.4 per 1000 starts	2.8
	Overall	1.4 per 1000 starts	1.5 per 1000 starts	2.9
STC Bukit Timah (1996-99)		1.3 per 1000 starts	3.1 per 1000 starts	4.4
*HKJC (1993-94)		0.7 per 1000 starts	N.A.	
**Japan (1985-94)		3.2 per 1000 starts	21 per 1000 starts	24.2
**Kentucky (1992-93)		1.4 per 1000 starts	3.3 per 1000 starts	4.7
** NYRA (1983-85)		1.1 per 1000 starts	7.3 per 1000 starts	8.4
***ERIRS (USA) (1992)		1.6 per 1000 starts	3.8 per 1000 starts	5.4

NB - PROVIDED BY DR STEWART 25th MAY 2001

* 21st AORVA 1995

** Review of Risk Factors Associated with Racing Injuries, George D Mundy, 1997/Vol 43/AAEP Proceeding

*** Equine Racing Injury Reporting System

SINGAPORE TURF TRACK NON CATASTROPHIC INJURIES REDUCED FROM 3.1 TO 1.4 PER 1,000 STARTS