

Dirt or Synthetic: Which Is Safer?

The Thoroughbred industry's biggest call to action has been to improve racehorse safety. At \$10-million apiece, are synthetic tracks the answer?

The loss of Barbaro and Eight Belles attracted unprecedented media attention to Thoroughbred racing. Since then, virtually every aspect of the industry has been publicly scrutinized, including safety.

Without a doubt, the most important development in the past five years in terms of maximizing racehorse safety has been the installation of synthetic racetracks at select locations throughout North America.

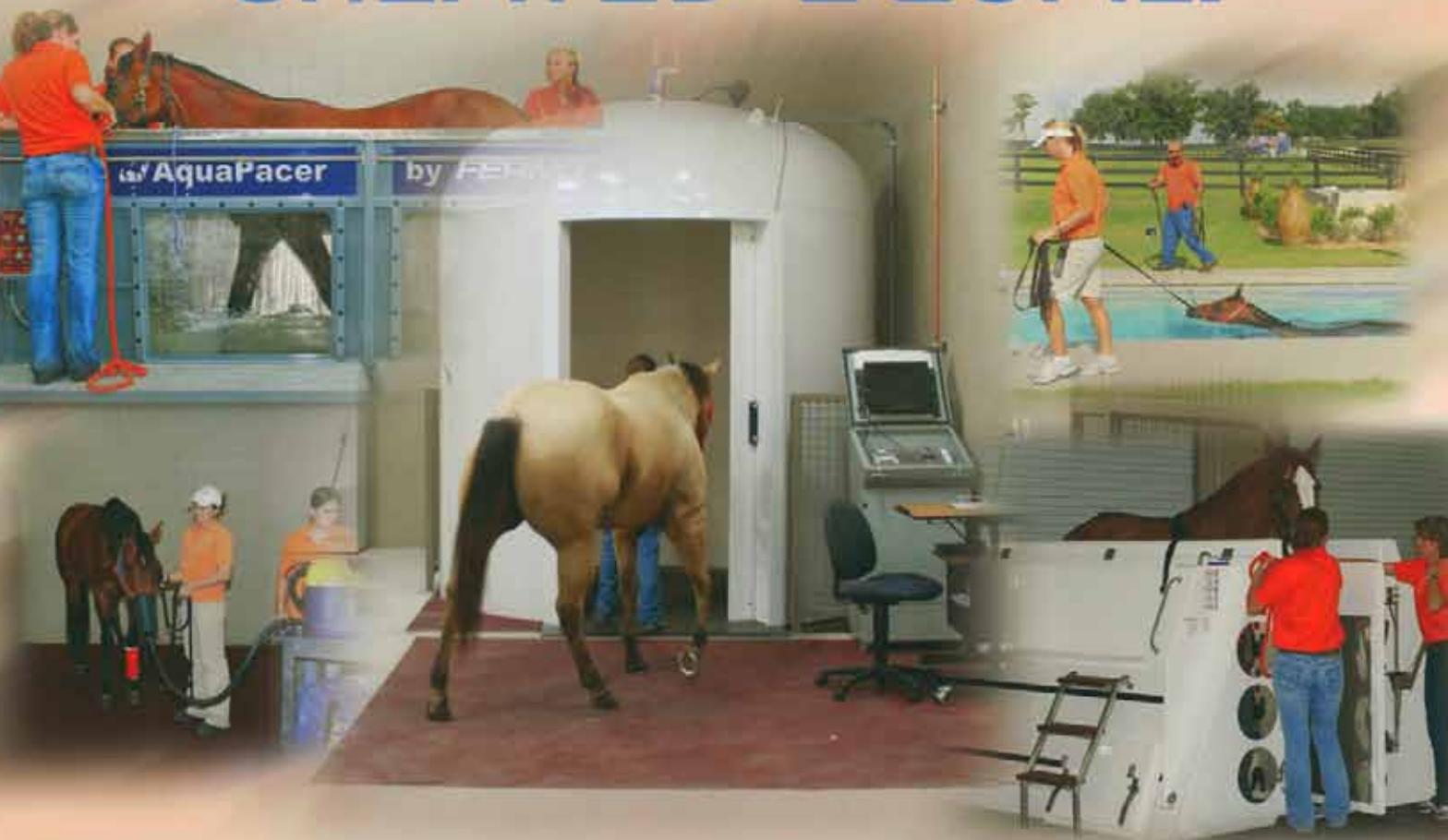
In December 2007, *The Blood-Horse* pub-



The Tapeta Footing surface at Presque Isle (top) and the Cushion Track surface at Hollywood Park

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lished a special report on synthetic surfaces that examined the new racing surfaces. The key question at that time was, "Are synthetic surfaces safer?"

While this question was important in 2007, it has become even more so over the past year. This article provides up-to-date analysis of the synthetic vs. dirt debate and attempts to answer the question, "Dirt or synthetic, which is safer?"

TRACK SURFACES: CURRENT OPTIONS

Aside from turf, there are currently two main types of racing surfaces installed at Thoroughbred racetracks and training centers throughout North America: dirt and synthetics. Since the majority of races in North America are run on dirt (or synthetics), the debate has largely spared turf from scrutiny.

A synthetic surface is a "catch-all" phrase describing any man-made racing surface that has replaced the traditional dirt track. There are currently four major brands of synthetic surfaces: Polytrack, Cushion Track, Pro-Ride, and Tapeta Footings. Each of these comprises a custom-designed mixture of natural and synthetic ingredients. At least one track of each type has been installed in North America.

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Elite, and Polytrack Premium (the latter two being similar to the Classic formulation but with the inclusion of specific additives such as jelly cable). Polytrack was first installed in England in 1987. Keeneland Race Course (its training track) and Turfway Park led the way for Polytrack in North America in 2004 and 2005, respectively, followed by Arlington Park, Del Mar Race-



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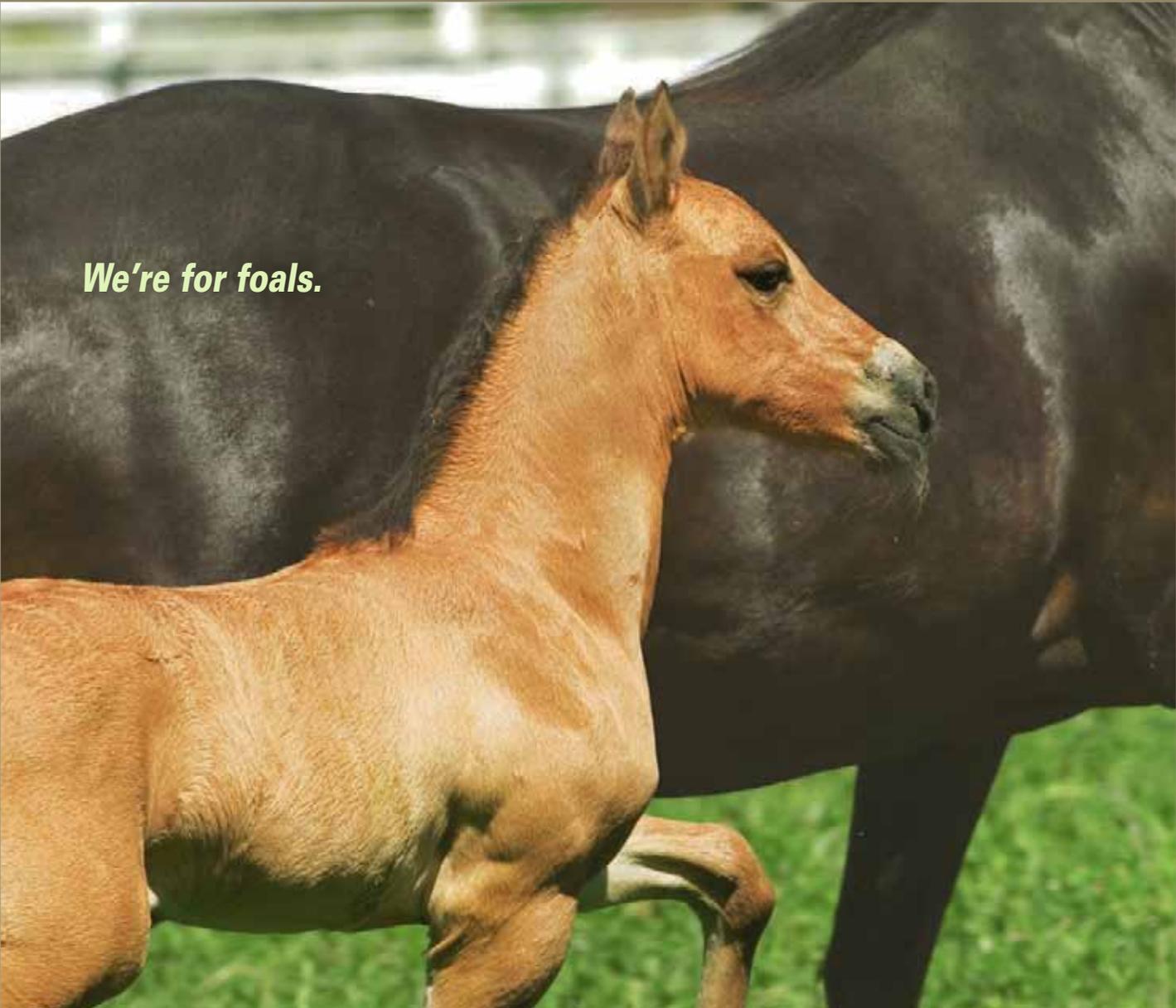
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track, Keeneland Race Course (main track), and Woodbine Racetrack.

CUSHION TRACK

A synthetic surface manufactured and installed by a United Kingdom-based group established more than 20 years ago, Cushion Track is a blend of synthetic including elastic, polyester, and polypropylene mixed with a high-performance multi-washed silica sand and blended with a special wax coating. According to the company, Cushion Track offers minimal kickback, secure footing, hoof support, and minimal maintenance. It is non-toxic and emulates turf. Santa Anita Park and Hollywood Park were both fitted with Cushion Tracks in 2007, but persistent drainage problems led to the removal of the customized Cushion Track

surface (designed to withstand temperatures in excess of 100 degrees) from Santa Anita.

PRO-RIDE

Pro-Ride Racing is an Australian company that has been installing all-weather synthetic surfaces since 1998. Its all-weather product, Pro-Ride, is a combination of sand, a patented polymeric binder, and a "PR cushioning agent" that, according to the manufacturer, delivers two-phase cushion technology to provide stable footing and support the horse throughout the "whole profile" (i.e., both the concussive and support phases). Pro-Ride replaced the Cushion Track at Santa Anita Park in 2008 and supported the first synthetic surface Breeders' Cup World Championship.

TAPETA FOOTINGS

Designed by trainer Michael W. Dickinson, Tapeta Footings is a patented all-weather surface composed (primarily) of sand, rubber, and fibers coated with hot wax that permits draining of water through the surface while the surface remains intact. According to the manufacturer, the surface is extremely stable, cushions the horse's front end while simultaneously supporting the hind end, enabling the horse adequate footing to push off. A study of the Tapeta Footings surface, which has not appeared to have been published in any peer-reviewed journal, was performed by Dr. George Pratt, a professor *emeritus* from the department of Electrical Engineering and Computer Science at Massachusetts Institute of Technology in Cambridge. The study reported that horses experience 50% less impact on the Tapeta surface compared to dirt tracks (as reported on the manufacturer's Web site). Golden Gate Fields in Berkeley, Calif., and Presque Isle Downs in Erie, Pa., have installed Tapeta Footings.

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into an overall economic benefit) played an important role in the decision to switch to synthetics. Nonetheless, racehorse safety was by far the biggest impetus.

While the state of California experienced a 40% increase in total racing fatalities on dirt tracks between 2003 and 2006, Turfway Park reported an 85% decrease in racing fatalities after installing North America's first synthetic main track in 2005.

Dr. Rick Arthur, the Equine Medical Director for the State of California, maintains that these two factors were the driving force behind the February 2006 decision of the California Horse Racing Board mandating synthetics only. Specifically, the CHRB declared that all California Racing Associations that operate meets for four or more continuous weeks would be required to install synthetic racing surfaces by the end of 2007 or they would be penalized and lose race dates.

But are synthetics safer?

THE CALIFORNIA EXPERIENCE

When asked if he thought racing on synthetics was truly safer than dirt, Arthur replied, "Yes, absolutely."



Synthetic surfaces are mandatory for Thoroughbred racing in California

To help compare racehorse safety before and after the installation of synthetics in the State of California, Arthur provided up-to-date figures for racing fatalities in California dating back to 2004.

"From 2004 until the installation of the synthetic tracks, there were 3.09 racing fatalities per 1,000 starts in California. After installing the synthetic tracks, this number decreased to 1.87 fatalities per 1,000 starts."

According to Arthur, this information is current until the end of 2008.

"In addition, the California data shows that regardless of the brand of synthetic surface installed, the number of racing fatalities decreased," he continued.

Arthur also reported that from the end of December 2008 until Feb. 7, 2009, there were no racing fatalities at Santa Anita.

"Blue Exit was the first racing fatality at Santa Anita in over 3,000 starts, which is impressive for any track in the United States to report," said Arthur.

Arthur was referring to Blue Exit, a 4-year-old bay colt, euthanized after suffering an injury during Santa Anita's March 7 Santa Anita Handicap (gr. I).

This corresponds to a fatality rate of less than 0.33 per 1,000 starts.

"This rate is comparable to European standards," emphasized Arthur.

NEW YORK—A HAVEN FOR DIRT

The impressive decrease in racing fatalities in California (and other states) since switching to synthetics makes one wonder why every track hasn't installed one, regardless of the cost.

The answer is, because the theory that synthetics are safer than dirt remains largely that—a theory.

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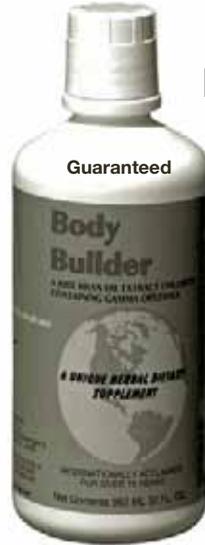
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Why We Need Data

As a result of the lack of virtually any information regarding the current safety of Thoroughbred racing as estimated by the number of racing fatalities in a given period, the industry and general public (including animal rights activists fighting to have horse racing banned in North America) are left relying on incomplete data sets and raw data reported in the media that can easily be construed as misleading.

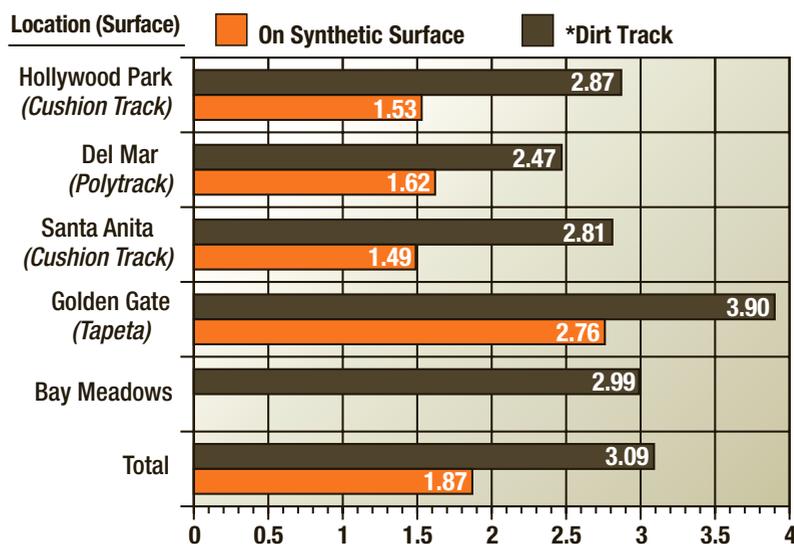
An excellent example is a March 19, 2009, New York *Times* article, "Horse Racing Begins Reform, but Legal Drugs Are Still an Issue" authored by William C. Rhoden.

In this article, Rhoden wrote that there have been 12 horses euthanized at Aqueduct Race Track in New York since Nov. 14, 2008, and seven at Santa Anita since late December 2008.

Without reporting a source for the data or citing it in a way that can be compared to the existing data, such as the number of racing fatalities per 1,000 starts, the perception is that racehorse fatalities are skyrocketing out of control. Based on data provided by the states of New York and California together with the injury data presented by Dr. Mary Scollay at the second Welfare and Safety of the Racehorse Summit, this is not the case.

Racing Fatalities in California per 1,000 Starts

(Provided by Dr. Rick Arthur to The Blood-Horse March 27, 2009)



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and director of racing of the New York Racing Association provided the following statistics to *The Blood-Horse*:

- 33 catastrophic racing injuries per 18,158 starts (1.8 per 1,000 starts) in 2007
- 24 catastrophic racing injuries per 18,772 starts (1.3 per 1,000 starts) in 2008
- 10 catastrophic racing injuries per 4,330 starts (2.3 per 1,000 starts) between Jan. 1 and March 31, 2009.

These injury rates, which were all calculated from dirt races, are similar to California's current injury rates reported on the synthetic surfaces (1.87 per 1,000 starts in 2008). So, based on these numbers alone, some could suggest dirt tracks are already as safe as synthetics.

Dr. C. Wayne McIlwraith, from Colorado State University's Orthopaedic Research Center, disagrees.

"Although there is not much data available, the data collected indicates there is a lowering of catastrophic injury on synthetic surfaces," he said. "However, differences in synthetic tracks, weather conditions, maintenance, and where horses have previously trained make it a complicated issue to analyze."

NATIONAL INJURY DATA

Data collected from 30 different racetracks in 2007 by Dr. Mary Scollay, then senior veterinarian at Calder Race Course and Gulfstream Park in Florida (presently the Kentucky Horse Racing Authority's Equine Medical Director), was presented during the March 2008 Welfare and Safety of the Racehorse Summit held in Lexington.

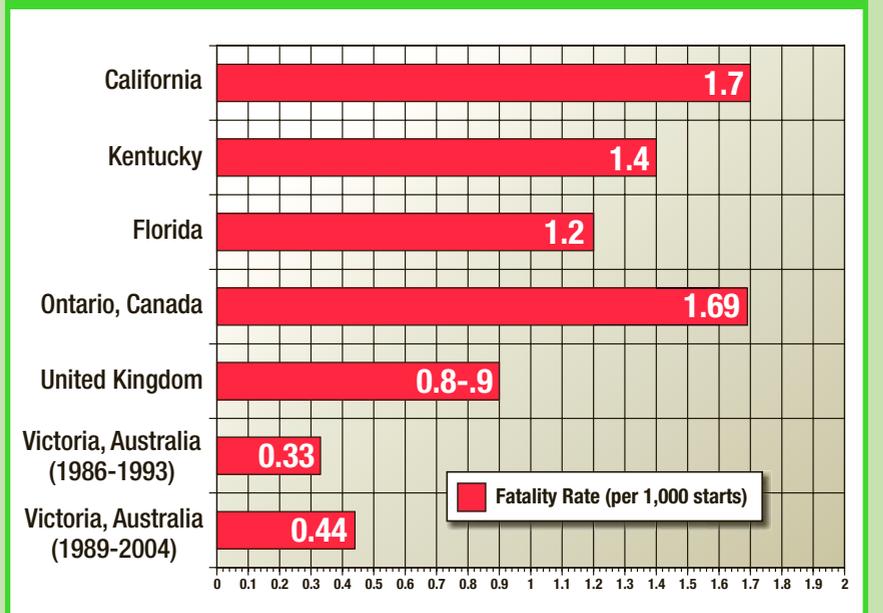
At this meeting Scollay reported that her preliminary data revealed a fatality rate of 1.47 horses per 1,000 starts on synthetic surfaces and 2.03 horses per 1,000 starts on dirt.

These results are in line with previously published (in peer-reviewed scientific journals) fatality rates which range from as low as 0.44 per 1,000 starts to as high as 2.36 per 1,000 starts. Type of surface was not specifically addressed in these studies.

In July 2008, The Jockey Club took over the injury reporting da-

Racing Fatalities per 1,000 Starts Reported in Published Studies

(from the Catastrophic Injury Special Report in 2008)



tabase and officially launched the Equine Injury Database. According to Bob Curran, The Jockey Club's vice president of corporate communications, the goal of this database is three-fold:

- To identify the frequency, type, and outcome of racing injuries using a standardized format that will generate valid statistics;
- Identify markers for horses at increased risk of injury, and;
- Serve as a data source for research directed at improving safety and preventing injuries.

In April 2008, Curran reported to *The Blood-Horse* that data would likely not be available in 2008 but would only be released after a "statistically significant period of time."

Almost one year later, on March 24, 2009, Curran stated, "We are still in the process of collecting data and no data will be released until enough data has been collected."

Curran declined to speculate on when we could expect it to be made available. Instead, Curran emphasized that at present, 78 tracks representing 83% of racing days in North America are participating in the Equine Injury Database. A list of participating tracks is available at www.jockeyclub.com/initiatives.asp?section=2.

Scollay volunteered, "It is important for the industry to ensure that we carefully collect and analyze all of the available data to ensure that the numbers we

ultimately generate for the number of catastrophic injuries on both dirt and synthetic tracks is accurate."

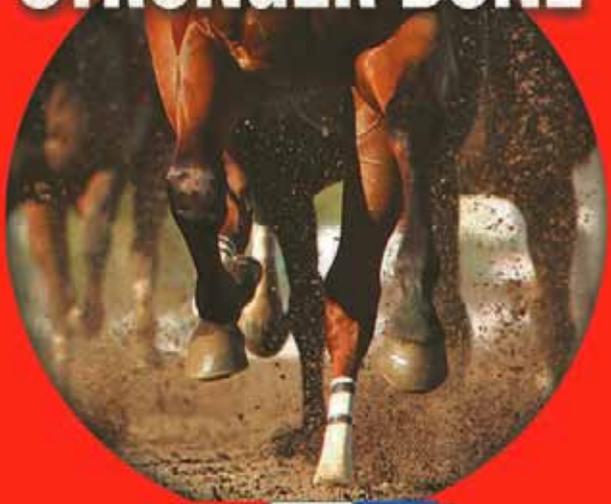
SYNTHETICS NOT UNANIMOUSLY ADOPTED

In the absence of an absolute answer to the "big question," complaints regarding virtually every aspect of synthetic tracks, not just maintenance-related concerns, abound.

For example, during a recent meeting in March 2009 at Santa Anita requested by the California Thoroughbred Trainers, Ian Pearce (founder of Pro-Ride), and Dr. Arthur, trainers voiced their concerns regarding the poor track surface and the potential safety implications associated with the new synthetic surface. Some trainers claim that injuries, both catastrophic and otherwise, have dramatically increased since the synthetics were installed in California. Meanwhile, other trainers attest that the synthetics are safer and that synthetic opponents are "forgetting" the number and severity of injuries that occurred on the dirt.

In addition, there is a perception that the number of both catastrophic and non-catastrophic injuries has not changed. In fact, some suspect that both have increased since synthetics have been introduced.

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According to Dr. Nancy Heitzeg, a professor of sociology at the College of St. Catherine in Minnesota, “There is anecdotal data that suggests that synthetic surfaces contribute to an increase in soft tissue

and hind-end injuries.”

Heitzeg serves as the voice of For Inesperado Track Watch—a group of volunteers that track, read, and analyze race charts from every track on a daily basis.

These (and other) concerns voiced by trainers, handicappers, and naysayers alike are somewhat supported by the fact the installation of synthetic tracks in North America has ground to a halt. After the initial flurry of construction, enthusiasm seems to have waned particularly in the face of the problems that have, and continue, to occur at Santa Anita.



ANNE M. EBERHARDT

Installing a synthetic surface may require up to a \$10-million investment

“The uncertainty of performance of the current installations along with the capital requirement of up to \$10 million is causing racetrack operators to take a wait-and-see approach,” said Jamie Martin, senior vice president at Woodbine in Toronto, in a 2008 interview.

ADDRESSING NON-FATAL INJURIES

In addition to potentially decreasing the number of catastrophic injuries, the overall number of injuries also appears to be lower on synthetic surfaces.

According to McIlwraith, “Dr. Jeff Blea, president of the Southern California Equine Foundation, and I put some data together and presented it at the 2008 Welfare and Safety Summit (the second Summit) with comparisons between when the horses were racing on dirt and racing on synthetics and did show a decrease in the number of surgeries, bone scans, and musculoskeletal radiographs when horses were racing on synthetics versus racing on dirt.”

Nonetheless, McIlwraith agrees there is some anecdotal evidence to suggest there may be an increase in the number of horses with hind-end lameness on synthetic surfaces; however, no data currently exist to confirm or deny this allegation.

In an attempt to address the issue of non-catastrophic injuries in Thoroughbreds, the Grayson-Jockey Club Research Foundation has just funded a study led by McIlwraith and Blea to follow a band of horses to collect data on injuries that occur in the band.

“This study will augment the data coming from the Equine Injury Database,” explained McIlwraith.

“The Jockey Club database on catastrophic injuries is recorded by regulatory veterinarians who do not get the opportunity to follow-up on other types of injuries. The treating veterinarians are the people in the barn everyday, and they are the ones who are going to collect information on all non-fatal injuries that will be recorded confidentially. This data will give us a better picture of the overall injury rate and whether there are risk factors associating with synthetic tracks,” he continued.

TESTING TRACK SURFACES: AN ALTERNATE MEASURE OF SAFETY

One other way that researchers are attempting to address the dirt vs. synthetics safety issue is by testing track surfaces and focusing on hoof-track interactions.

McIlwraith, together with Dr. Michael “Mick” Peterson, a professor of mechanical engineering at the University of Maine, has developed a device capable of objectively evaluating track surfaces.

Based on their track surface testing performed to date, this device has been recognized by the industry as an important component of improving racehorse safety. As such, a track surface committee was created subsequent to the two Welfare and Safety of the Racehorse Summits.

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to agree, that maintaining surface consistency is the first step toward reducing racehorse injuries," summarized Peterson. "In addition, we need to develop and apply appropriate biomechanical tests that are capable of accurately identifying consistent surfaces. This will eventually enable us to develop optimized racing surfaces and understand how to care for these surfaces regardless of the weather or use."

In an effort to achieve this goal, McIlwraith and Peterson will be at Churchill Downs prior to the May 2 Kentucky Derby Presented by Yum! Brands (gr. I) testing the track's surface.

"I think this is a clear demonstration by Churchill, and the equine industry in general, that we are all really trying to do our best to improve racehorse safety," said McIlwraith.

Ultimately, the goal is to conduct large studies in which a racehorse's career can be monitored and correlations between the effect of surface and wastage and loss of performance can be identified.

According to Peterson, "This effort will truly impact the industry and the health of the horse when we begin to see linkages between the surface measurements and epidemiological studies."

FINAL TALLY

While the CHRB, among others, might have been misled regarding the overall impact synthetic surfaces would have on equine injuries (catastrophic and otherwise) in addition to the unfortunate outbreak of maintenance issues, the California data certainly indicate the synthetic path was the right way to go.

Whereas some managers believe they are wise to wait until maintenance issues have been resolved prior to forking over millions of dollars for a new synthetic surface, Arthur disagrees.

"Our experience in California with synthetic surfaces has been a good one as far as racing fatalities are concerned, but we need more data and not just on horses suffering catastrophic injuries. We need to look at non-fatal injuries and the type of injuries that are occurring, not just during racing, but also training," he said. "Maintenance and consistency problems have been frustrating including the installation snafu that forced the close of Santa Anita in the middle of last year's winter meet."

Arthur continued, "We have data showing that our racing fatalities have decreased substantially since the horses started racing on synthetics; however, it's still not good. We need to continue to find ways to further improve racehorse safety. I'm not sure we have a good handle on the real number of non-fatal racing- or training-related injuries and what the cost of these injuries is to the equine industry." 



Synthetic surfaces may require less grooming and grading, but are by no means maintenance-free

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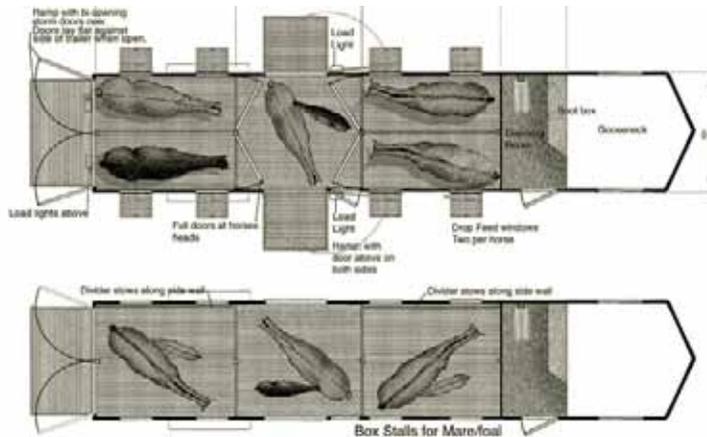
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STRANGLES

Strangles is a dreaded disease for horse owners, writes Dr. Amanda Martabano House in the April issue of *The Horse*. It is caused by bacterial infection with *Streptococcus equi* subspecies *equi*.

The bacteria typically infect the upper airway and lymph nodes of the head and neck. Strangles has affected horses for centuries. Highly contagious, it can recur on farms with previous outbreaks and is one of the most commonly diagnosed contagious equine diseases worldwide. *S. equi* might survive in water sources for more than a month, but primary sources of recurrent infections are asymptomatic carrier horses that shed the bacteria for months to years.

Call your veterinarian right away if you suspect an outbreak; he or she can accurately diagnose illness and recommend control practices. Some state veterinarian offices require practitioners to report cases. Do not transport horses on or off the farm, and take all resident horses' temperatures twice daily. Horses can transmit *S. equi* one to two days after developing a fever, so isolate at the first sign of fever to avoid spreading infection.

In an outbreak, divide horses into three groups: infected horses (with fever, nasal discharge, etc), exposed horses, and unexposed horses. Nose-to-nose contact or bucket sharing should not occur among groups. Unexposed horses should be kept in a "clean" area, and they should have separate caretakers, equipment, water

troughs, and pastures. People and shared equipment can transfer bacteria, so diligent hand washing and disinfection of supplies are necessary. If separate personnel aren't possible, then handle healthy horses first. Use protective clothing (boots, gowns or coveralls, and gloves) when managing infected horses.

Thoroughly clean and disinfect all water troughs daily during an outbreak, following disinfectant label instructions. Disinfect all surfaces after removing manure/organic material, which inactivates some solutions. Compost infected horses' manure and waste feed in an isolated spot—don't put it on pastures. Rest sick horses' pastures for at least four weeks.

Some infected horses don't appear sick and continually re-infect your farm's herd. Ideally, vets should test all horses on the farm, and they should test sick horses three consecutive times—yielding negative results—before putting them back with healthy horses. Disinfection, isolation, and diagnosis can be costly, but they are cheaper than additional outbreaks.

Vaccination can prevent infection, but it doesn't guarantee prevention. It reduces the severity of strangles in most infected horses. Improper administration can mean poor protection and/or injection site complications, so your veterinarian should administer the vaccine. Vaccinating during an outbreak is not recommended.

STRESS AND IMMUNITY

Ulcers aren't the only stress-related health threats to horses. Long-term exposure to stress suppresses horses' immune systems, alters their metabolic rates, and can promote personality changes, including aggressiveness and depression, writes Pat Raia in the April edition of *The Horse*.

"The definition of prolonged stress exposure is that the horse cannot adapt to the stress and becomes clearly agitated," said Dr. Sarah Ralston. "And there's a difference between stress and distress."

Distressed horses exhibit behaviors such as nervousness and aggression, extreme irrational anxiety, excessive snorting, and an inordinate sensitivity to noise. The threshold between stress and distress varies from horse to horse.

Although every horse has some stress in its daily life, horses' stress levels are more likely to rise in connection to specific activities or life changes.

Unlike the temporary stress of early life, training-related stressors occur throughout a horse's lifetime. That's because horses must process new information and adapt to new performance standards every time they're asked to master new skills or perfect old ones.

Patience is key to minimizing training-related stress, and that means giving horses in training regularly scheduled breaks when they exhibit training-fatigue behaviors. Relocating hay and feed along with the horse can blunt some of the transition stress.

It's nearly impossible to keep horses unstressed all the time. Be conscious of things that stress your horse and work to manage its environment to reduce stress. 

Excerpted from *The Horse: Your Guide to Equine Health Care*.
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