



Aluminum plates are the most popular shoes in the sport

Light on Their Feet

PROPER SHOEING, FARRIER WORK
REQUIRED FOR A RACEHORSE TO BE AT ITS BEST

By AMANDA DUCKWORTH

ALUMINUM SHOES HAVE been the standard-bearer for decades when it comes to the footwear of choice for racehorses. The reasoning is pretty straightforward: Aluminum is lighter than steel—the other most common metal used for horseshoes—but it still provides protection and traction.

There are a myriad of options out there to choose from beyond just standard aluminum racing plates, including different shapes and materials or not wearing shoes at all. Unfortunately, a racehorse cannot report back on what feels the best while it is galloping at full speed, and,

furthermore Thoroughbreds are not known for having the hardest of hooves.

Common ailments that can derail training include bruises, abscesses, and quarter cracks. Without healthy hooves a racehorse cannot be at its best, and proper shoeing and farrier work are important parts of the equation.

Dr. Scott Morrison took an in-depth look into the situation in his paper “The Thoroughbred Racehorse Foot: Evaluation and Management of Common Problems” for the American Association of Equine Practitioners.

“The importance of foot shape and

balance in high-performance racehorses is paramount to maintaining soundness and optimal performance,” he explained.

“Functionally adapted for speed and efficient use of energy, the Thoroughbred foot is light and lacks the mass for protection commonly seen in other heavier-boned breeds.

“The relatively thin walls and soles of the Thoroughbred foot make it more susceptible to injury and hoof capsule distortion. Hoof capsule distortion refers to hoof abnormalities such as flares, cracks, under-run, collapsed, and sheared heels—all of which result from long-term abnormal weight distribution on the foot. Distortions affect function and have been correlated to musculoskeletal injuries and lameness.”

Proper shoeing can go a long way toward preventing and correcting problems, and racehorse practitioners and farriers often work together to keep issues in check.

SAFETY FIRST

In addition to visible signs of hoof issues or lameness, horses also depend on work riders and jockeys to be their voice should the riders feel changes within their mounts. This benefits the entire partnership. Besides shoes keeping a horse's hooves healthy in normal conditions, a racehorse must also be shod in a manner that is safe for both horse and rider at high speeds.

With this in mind, researchers published “Jockey Perception of Shoe and Surface Effects on Hoof-Ground Interactions and Implications for Safety in the Galloping Thoroughbred Racehorse” in the February 2021 edition of the *Journal of Equine Veterinary Science*.

“Riding racehorses is a high-risk profession, and optimizing safety alongside performance is paramount,” explains the study. “Horseshoes play a critical role in providing traction with the ground surface and are therefore a major determi-

ANNE M. EBERHARDT PHOTOS

nant of safety. However, the subjective perceptions of expert riders influence attitudes toward using different shoes and must be taken into consideration before any changes may be implemented.”

For the study, researchers assessed 94 questionnaires, based on 15 horse/rider pairs. Jockeys’ opinions were collected after galloping Thoroughbreds over turf and artificial surfaces in four different shoeing conditions—aluminum, steel, GluShu (a type of glue-on shoe), and barefoot. The purpose was to explore impact, cushioning, responsiveness, grip, uniformity, smoothness of ride, safety, adaptation period, and overall rating for each shoe-surface combination.

The resulting data found shoe type significantly affected all question responses



Proper shoeing and farrier work are important in getting the best performance from a Thoroughbred on the track

with the exception of impact, while surface-type significantly affected perception of grip and safety.

“Overall, jockeys showed a preference for aluminum and steel shoes across both artificial and turf tracks,” the study concluded. “These rated ‘excellent’ and were

considered to be ‘very supportive’ in approximately 80% of trials, with a 100% ‘active’ response, good grip, and a quick adaptation period.”

In contrast, barefoot and GluShu conditions were generally considered “moderately supportive,” with barefoot appear-



Body Builder: It Works!

The first and still
the best since 1986

- Proven the best for sales prepping weanlings, yearlings and 2-year-olds in training
- Increases muscle, energy and stamina

800-413-3702 | 727-562-2832

WWW.EQUIADE.COM | info@equiade.com

1 Bottle+1 Horse=2 Months | Winners are raised on Body Builder

Can be purchased online at www.equiade.com or through these distributors:

BIG DEE'S | JACK'S MANUFACTURING | VALLEY VET | PINKSTON'S | ANIMAL HEALTH INT'L

RJ MATTHEWS | FLORIDA HARDWARE | SMARTPAK | HAGYARD PHARMACY | WESTERN SADDLERY

To see more Before & After photos follow us on Facebook: <https://www.facebook.com/EquiadeInc/>

Hoof Care

ing favorable on the artificial surface.

On turf, barefoot was deemed the least smooth and the only condition that jockeys sometimes marked “unsafe” (17% of responses). Future work aims to investigate the relationship between jockey opinion and hoof kinematic data.

While jockeys in the study felt the most unsafe while galloping on barefoot horses, the idea of leaving a horse unshod is not a new one in both the Thoroughbred industry and the Standardbred world.

The concept of Standardbreds competing unshod was recently examined and also found an increase in safety concerns when horses were left barefoot in racing conditions. *Animal Science Journal* published “Benefits and risks of barefoot harness racing in Standardbred trotters” in May 2020.

“Velocity time (VT) was found to be significantly influenced by shoeing condition (e.g., unshod, shod front, shod hind, or fully shod), but also by sex, age, season, track, track condition, start method, start position, and distance,” researchers found. “Horses racing unshod had 0.7 s/km lower VT than fully shod horses and showed better performance when racing on neutral tracks during the late summer than horses with other shoeing conditions during the same period.

“However, racing unshod increased the relative risks of galloping and disqualification by 15%–35% in all seasons. Horses shod only on the hind hooves showed better performance than fully shod horses, without higher risks associated with competing unshod.”

SHAPE SHIFTER

Proponents of the unshod method often point to the effect shoeing has on a horse’s hooves. As one would expect, it does alter the hoof, and researchers continue to look into the impact of these changes.

The specifics of how shoes and their shapes can affect equine heels were recently examined in “Can the hoof be shod without limiting the heel movement? A



A racehorse must be shod in a manner that is safe for both horse and rider at high speeds

comparative study between barefoot, shoeing with conventional shoes and a split-toe shoe,” published in *The Veterinary Journal’s* April 2019 issue.

“Conventional shoeing restricts heel movement, which may have a negative effect on the orthopaedic health of the horse,” the researchers explained. “A randomized crossover experimental study using noninvasive techniques was performed to compare the mediolateral heel movement in barefoot horses, horses shod with a conventional toe-clipped shoe, and with a new type of shoe with a split toe.”

For the study, eight horses’ forelimbs were randomly tested in all three fashions, and a potentiometer was used to quantify heel movement of the horses at the walk, trot, and canter on a treadmill.

“The conventional shoe was associated with significantly less heel expansion compared with the ST shoe and barefoot situation in all gaits,” the study found. “Heel expansion with the ST shoe was not significantly different from the barefoot condition. For all gaits, shoeing was associated with a significant reduction in heel contraction compared with the barefoot situation, except for the heel contraction at the canter using a conventional shoe.

“In conclusion, the heel expansion with the ST shoe did not differ significantly from when the horse was barefoot, in contrast with the significant restriction of the heel movement when a

conventional shoe was used.”

While it is accepted that shoeing can impact heel expansion, the results of that impact are not fully understood. In its December 2020 issue the *Journal of Equine Veterinary Science* published “Do Metal Shoes Contract Heels?—A Retrospective Study on 114 Horses.”

“Heel contraction is an undesired but common condition in domestic horses,” researchers explained. “There is a correlation between shoeing and a restriction of heel expansion, but the clinical significance is unknown. This study aimed to evaluate the influence of shoeing and other risk factors, such as age, access to paddock, and breed, on heel contraction.”

Data were collected from 114 horses, and of the group, 55 had never been shod and 59 had been consistently shod for at least the previous year.

“Although heel contraction occurs more often in shod horses compared with barefoot horses, the difference between the two conditions was not statistically significant when other factors were considered,” researchers concluded. “The most important factors that impacted contraction were individual horse features and breed. The effect of age and a yard was noticed. The sex, paddock time, and the shoeing and its duration were found not to have statistical significance.

“The study concluded that heel contraction is a multifactorial problem, mainly caused by breed and unknown

features correlated with individual. It was not confirmed that horseshoeing causes heel contraction. Because of significant difference in incidence of contraction between yards, there is a need for further investigation of environmental factors causing this hoof distortion.”

Researchers have also been examining how shoeing horses changes the hoof shape and what lessons can be taken from that. “Changes in Hoof Shape During a Seven-Week Period When Horses Were Shod Versus Barefoot” was published in *Animals* in December 2019.

“The domestic horse hoof is a continuously growing biological material



A farrier's handiwork is important to keep a horse sound and balanced for optimal performance

that is frequently subjected to human intervention,” researchers explained. “Both hoof trimming and the individual farrier performing the trim have significant effects on the shape of the hoof capsule. Although it is common for horses to wear shoes, there is a lack of basic scientific knowledge regarding

the interaction between the horse hoof and the horse-shoe. Research indicates that a horseshoe can have significant effects on the movement of the horse.”

In the study, 11 adult Quarter Horse mares were divided into two groups and underwent both treatments—shod and barefoot—in a crossover design. They were each randomly assigned to their first treatment. The same farrier trimmed all of the horses' feet at the beginning of the study, and all rear hooves were left unshod.

“This study demonstrates a significant effect of shoeing on hoof shape,” researchers concluded. “Horses that were shod displayed a larger decrease

Pyranha

IT WORKS!
TRUSTED • PROVEN • POWERFUL

THE ULTIMATE PROTECTION COLLECTION

A NEW WAY TO SPRAY, CONTINUOUS AT ANY ANGLE!

Pyranha
YOUR TRUSTED LEADER IN INSECT CONTROL

800.231.2966
www.pyranhainc.com

FAMILY OWNED & OPERATED
MADE IN USA

Hoof Care

in proximal hoof circumference, a decrease in hoof angle, a reduction in solar circumference, and less wear at the toe than occurred when they were barefoot.

“A better understanding of the factors that influence hoof shape may lead to better hoof management practices that minimize the risk of injury to the horse.”

SURFACE MATTERS

When it comes to racehorses, in addition to the type of shoes they wear the type of surface they run on is usually part of the equation to determine what is best for an individual.

The effectiveness of several kinds of shoe combined with the importance

of track surface was examined in the study “Dynamic testing of horseshoe designs at impact on synthetic and dirt Thoroughbred racetrack materials,” which was published in *Equine Veterinary Journal’s* January 2016 issue.

“Different horseshoe designs have been developed in an attempt to optimize footing for equine athletes,” explains the study. “Horseshoe performance is assumed to be dependent on the surface and gait, but there are limited data on horseshoe performance on different surfaces, independent of gait variation.”

For the study, a flat racing plate, a serrated V-Grip and a shoe with a 6 mm toe

grab and 10 mm heel calks were tested on synthetic and dirt surfaces under typical operating conditions.

“Maximum vertical and shear loads and loading rates were not significantly different between shoe types, with the exception of a reduced craniocaudal loading rate for the V-Grip shoe on the synthetic surface,” the study found.

“All other statistical significance was related to the surface material. These three different Thoroughbred racing shoes do not have a significant impact on loading and loading rate, with the exception of the V-Grip shoe on a synthetic surface.

“Although the V-Grip may reduce craniocaudal peak load rates in a synthetic

MESSAGE FROM THE GRAYSON-JOCKEY CLUB RESEARCH FOUNDATION

UK GLUCK CENTER AND INDUSTRY LEADERS RESPONDING TO AN UPTICK OF FOAL DIARRHEA CASES

By HOLLY WIEMERS



Grayson-Jockey Club
Research Foundation

THE FIRST SEVERAL months of the year make up the bulk of the busy foaling season in Central Kentucky, so when the region’s farms and equine practitioners began noticing increases of diarrhea in foals ages two- to seven-days old, there was concern.

In response, the University of Kentucky Gluck Equine Research Center is using a portion of its existing Koller Emergency Funds, and the Kentucky Thoroughbred Owners and Breeders Foundation, Grayson-Jockey Club Research Foundation, and Coolmore America are leading an effort to help provide additional funding, allowing research to begin immediately.

“Anytime we recognize an increased incidence in equine health cases, such as foal diarrhea, we prepare and mobilize to further our understanding

of the health issue,” said David Horohoy, chair of the Department of Veterinary Science and director of the Gluck Equine Research Center. “Early detection and rapid diagnostics are at the cornerstone of what drives our research approach.”

Foals commonly develop diarrhea a week to 10 days after foaling, and veterinarians and farm owners typically have the experience and tools to respond. According to the American Association of Equine Practitioners, it is important for a veterinarian to evaluate foals under a month old when they experience diarrhea because they can develop life-threatening dehydration in as few as six to eight hours. Neonatal or young foals have a digestive tract, similar to that of humans, where small intestines are responsible for much

of their nutrition absorption. Dealing with this type of attack on the small digestive system heavily impacts foals, which is a big reason the Gluck Center will focus its research efforts on this issue.

A significant increase in the illness has affected some farms while other farms have had few to no cases. In spite of these incidences, UK has not recognized a rise in reported mortality associated with these cases and continues to monitor the situation.

UK College of Agriculture, Food, and Environment researchers have developed a multipronged research plan to help further the understanding of the problem.

One focus is to expand scientists’ knowledge of the foal gut environment. This will add to their understanding of

material with relatively high wax and/or low oil content, the reduction in load rate is less than the difference found between materials. This study indicates that shoeing has little effect, and that a track's surface material and its preparation have a significant effect on the dynamic loading during the impact phase of the stance."

The impact that surfaces have on Thoroughbreds' hooves was also explored in "Effects of racetrack surface and nail placement on movement between heels of the hoof and horseshoes of racehorses," which was published in the September 2016 issue of the *American Journal of Veterinary Research*.


For the study, 1,121 horseshoes

from 242 Thoroughbred racehorses were collected during routine farrier work at four racetracks with dirt or synthetic surfaces, which resulted in data from 1,014 of those shoes from 233 racehorses. The shoes were photographed, and then the length and width of grooves formed at the heels of the solar surface of horseshoes were measured to assess the effects of the racetrack, racetrack surfaces, and shoe characteristics including the size, clips, and nails.

"Length and width of wear grooves differed significantly on the basis of racetrack, nail placement, and limb side (left vs. right)," the study found. "Differences in groove dimensions between

types of racetrack surface (dirt vs. synthetic) were less apparent than differences among racetracks.

"Measurements of the length and width of wear grooves in the horseshoes of racehorses may be useful for understanding some aspects of hoof interactions with various racetrack surfaces."

As with many other equine issues, there is still plenty to learn about how shoes and hooves relate to one another, especially when it comes to racehorses. When presented with a troublesome hoof, working with veterinarians and farriers to figure out what is best for each individual horse is a key to the process. 

neonatal gut bacteria and the effect of antibiotic treatment.

A second part is to study the differences in mares and their foals on farms both with and without early neonatal diarrhea cases and the effect of antimicrobial drug treatment. Researchers will conduct this analysis through gene sequencing to determine an overview of type and diversity of gut microflora.

They will also use the data in this part of the study to gain insight into the effect of antimicrobial use in foals on the development of their gut microflora.

The third prong of the research will investigate a biotherapeutic approach on one farm. That farm is supplementing foals with home-fermented live yogurt instead of a commercial pre/probiotic. Research has shown that *Lactobacillus spp.* bacteria are among the first colonizers in the neonatal gut. Data from other species support *Lactobacillus spp.* as promoting gut health and outcompeting pathogens

in gut colonization.

In addition to the studies, the UK Gluck Center and Veterinary Diagnostic Laboratory team has identified further potentially useful tests, including gene sequencing targeting identification of novel viruses and bacteria that might be present.

With limited Koller Emergency Funds available, the UK Gluck Equine Research Center is thankful for the additional dollars provided by the KTOB Foundation, The Grayson-Jockey Club Research Foundation, and Coolmore America.

"The foundation members met March 15 and felt this research and timing are consistent with the sole mission of responding to threats to the breeding industry in Central Kentucky. We are grateful to Gluck for accessing their emergency funds and everyone for responding so quickly," said Jimmy Bell, chairman of the KTOB Foundation.

"Situations such as these highlight the relevance for a coordinated effort

that can be led by our scientists at the Gluck Equine Research Center," said Dr. Stuart Brown, veterinarian, Keeneland equine safety director, and chair of the Gluck Research Foundation. "Our team mobilizes to work with equine practitioners and farms throughout the area, allowing us to further our understanding and develop our approach to work on these types of issues. We appreciate the opportunity to collaborate with other partners to enhance our abilities when issues like this arise."

"We at Grayson-Jockey Club Research Foundation believe in supporting timely equine health for all horses at every stage of their lives, and foal diarrhea is proving to be a concern this year on Central Kentucky farms," said Dell Hancock, chair of the foundation. "We are happy to help facilitate research to address this condition and thank the University of Kentucky's Gluck Equine Research Center for their commitment to the well-being of horses."