

NO FOOT NO HORSE: managing the feet of the thoroughbred racehorse

Horses need natural ability to perform at a high level in any discipline. This is especially important for the thoroughbred racehorse, where a race can be won or lost by as little as a nose. Whether you are the owner, the trainer or the healthcare provider, there is a huge desire and a continuous search for those marginal gains that may allow your horse to reach its full athletic potential.

Farriery, or more specifically our approach to the care and the management of equine hooves, plays an incredibly important part in this quest for success.

It is, however, not solely about reaching that maximum potential, but also about maintaining soundness and reducing the risk of both injury and lameness. This involves a holistic approach in the management and care of the feet.

The considerations

Managing the flat-footed thoroughbred requires a thorough understanding of both the biology underlying the make-up of the foot and the physics involved in the normal mechanical function of both the limb and the foot. Understanding these processes not only allows us to intervene but also prevents over-zealous intervention that can itself result in training setbacks.

Thoroughbreds often have long sloping pasterns with a 'long-toe-low-heel' conformation. This will often correlate to the breed's natural conformation; a much lower shoulder angle, lower foot flight, longer stride length, smoother ride and ultimately quicker pace than that of other breed types.

The greatest concern, as a result of the tremendous forces experienced by the hoof during fast-paced work, is that we lose the structural integrity of the heel and the back half of the hoof. This not only exposes horses to commonly seen conditions such as heel bruising, corns and quarter cracks, but also increases the risk of musculoskeletal injuries at distant sites.

It is of the utmost importance that we aim to restore the relationship between the toe angle and the heel angle. This is often achieved by engaging the structures of the hoof similar to that of how the hoof would function naturally without shoes. This involves the sharing



The hooves of thoroughbred racehorses are subject to tremendous forces

of the responsibility of weight-bearing across multiple structures including the frog, the bars and the sole. In doing this, we increase the surface area of the hoof that is in contact with the ground and reduce the pressure absorbed by the heels alone. This can be achieved with a large emphasis on the correct balance in addition to the incorporation of modern materials and corrective shoeing styles.

Often a much quicker response in this restoration of balance and function can be achieved through the management of feet, barefoot. This is often most effective and of truly great benefit when horses have extended periods of rest or time out of training.

Benefits of a healthy hoof

The healthy hoof has a brilliant shock absorption mechanism that is able to absorb and dissipate the forces of weight-bearing around the hoof structures and up the limb. It achieves this in many ways, such as the natural expansion and return of the hoof capsule upon loading and unloading. The soft digital cushion that occupies the back half of the hoof absorbs forces and evenly transmits them across structures and away from the hoof. The large vascular network within the hoof capsule and its hydrostatic functionality acts to dampen those forces, using it to transmit blood away from the hoof, up the leg and back towards the heart.

When these structures that work so

well as a whole begin to fail, the hooves' inability to cope with the repetitive forces from cyclic loading begins to show. At a gallop, it is believed that the foot experiences forces 2.5 times that of the horse's own body weight. Studies would also suggest that 70% of forelimb lameness is associated with the feet, and from experience this would imply that by improving hoof health we can greatly help to reduce our chances of lameness. So we must therefore look into why thoroughbreds commonly have 'unhealthy' hooves. I will explain a little further.

Often, thoroughbreds are bought and sold as yearlings, enter pre-training and subsequently full training, all within a two-year period. During this time, they are shod in preparation for the sales and will then remain in shoes throughout their racing career, being shod on average every two to four weeks. During these younger years, horses are growing rapidly, developing and strengthening.

Having steel shoes nailed on can restrict the hoof and limit its natural ability to respond and compensate. This is one contributing factor to poor quality hooves, but there are many more factors, such as the continuous use of nails for shoe application on thin-walled hooves, shorter shoeing styles to avoid premature shoe loss, shorter shoeing cycles due to the use of thinner, lighter materials, and the continuous shoeing of horses year-round as we move from racing on the turf



Figure 1 Image showing a quarter crack in the coronary region. Notice how it often correlates to the last weight bearing point of the shoe

to the all-weather surfaces.

The consequences of these factors are problems most of us would be familiar with and include corns, hoof cracks, solar bruising and nail binds. Although these commonly seen problems are impossible to rule out, a proactive approach can help to reduce the chances of having to experience such issues.

Why do we experience 'long-toe-low-heel' syndrome?

Long toes in combination with low heels have been linked to significant musculoskeletal injuries, and without proactive management and good farriery, pose serious risks to the wellbeing of these horses.

The hoof functions by expanding upon load, and returning to a resting state when that load is removed. This movement of the hoof is seen more so at the heel region with the opening and closing of the heel bulbs during motion. The continuous expansion of the hoof causes wear of the soft horn at the heels against the hard steel or aluminium shoe.

This can very often be seen as a large indentation in the area of the shoe in contact with the foot upon removing the shoes. As the heels are continuously wearing down, the toe continues to grow and we get this progressive deterioration towards the typical long-toe-low-heel syndrome. As farriers we must work to restore the hoof angles and in particular, that of the heel angle, to encourage strength and structural integrity in the back half of the hoof.

This can often prove troublesome



Figure 2 & 3 The two images show horses with both long toes and relatively low heels. As the toe length increases, more pressure is experienced on the heel, also restricting heel horn growth

to correct, especially for those horses in full training. It is therefore why a proactive approach to hoof care, and an understanding that prevention, rather than a cure, is often the better solution.

A proactive approach: conformational assessments

Understanding, assessing and predicting the consequences of conformation allows us to proactively shoe horses in order to compensate for, or to complement, conformation. Conformation is assessed both statically, assessing the build and make-up of the horse, and also dynamically, watching how the horse walks, trots and on occasion exercises.

Gathering both photographic and video data of both a static and dynamic assessment allows for the documentation of changes. Understanding best practice with relation to a particular conformation type can help to reduce the chances of commonly seen hoof problems.

Consistency in care

Regular care and the continuous monitoring of horse's feet through daily and weekly checks allows us to detect changes occurring throughout the season or training career. Understanding those changes allows us to tailor the trimming and shoeing styles accordingly.

In addition, the understanding of what is normal as a horse ages and transitions



Figure 4 & 5 The two images above are nine months apart and show a significant increase in both toe and heel angle. They also show a closer correlation between toe and heel angles. Note also the improvement in the overall condition of the hoof

from periods of rest into training allows us to be less reactive and more proactive in allowing the feet to develop and transition accordingly.

Barefoot management

Regular periods of going without shoes helps to rehabilitate horses' feet and is incredibly important in improving overall health and function.

Breaks and periods of rest from shoes should be used to allow the hoof to repair and also to restore normal balance. Helping to restore balance and correcting the disparity between heel and toe angle helps to reduce the proven links with musculoskeletal injuries.

Shoeing style

Avoiding the traditional short shoeing styles and providing support around the heels can often pre-dispose horses to premature shoe loss. Nonetheless, the advantages of helping reduce strain on the tendons, ligaments or the development of corns or heel bruising certainly outweigh the occasional inconvenience of a lost shoe. Therefore shoeing style, shoe type and shoeing cycle is decided upon an individual basis that better meets the needs of the horse.

Modern approach

Embracing the use of modern materials allows us to recover and restore strength >>



Figure 6, 7 & 8 The images above show a range of modern materials commonly used to help manage and maintain thoroughbred feet

» and structure to compromised feet. Using modern materials, incorporating new technology and advances in the use of silicones, urethanes and adhesives should be included in standard practice.

This allows us to manage feet more effectively, reduce periods of lameness or poor performance and also keep horses in training that may have struggled otherwise. Modern materials

allow us to look at alternative methods of shoe attachment, solar support and cushioning, which can help us to achieve a healthier hoof.

The success of any sporting equine is achieved not only through the horse's ability, but also through the collaboration of a great team. Working with horses is unpredictable and having a thorough understanding of the horse and the

biomechanics of its motion certainly help towards making the most efficient and effective decisions when it comes to hoof care. However, communication and close working relationships with the veterinary team, head staff, trainers and occasionally the owners is just as important. 'No foot no horse' is a term that is never truer than when it comes to the thoroughbred racehorse.

THE RACEHORSE

A Veterinary Manual

By Pieter H.J. Ramzan

Written by one of the UK's leading equine veterinary practitioners, this textbook is dedicated wholly to the veterinary management of the racehorse. The Racehorse: A Veterinary Manual brings together all the major orthopaedic and non-orthopaedic conditions likely to be encountered in racehorse practice and concisely details state-of-the-art 'best practice' for diagnosis and management. The book spans the full range of fields relevant to the clinician, including topics as diverse as rehabilitation, respiratory medicine, exercise physiology, pre-purchase and 'herd health.'



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