

**Heel first.....**

**then**

**heel-first .....**

**.... may be.....**

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**There is a lot of talk about how the horse is placing its hooves onto the ground when in motion:**

**What's first: Toe or heel?**

**Some people are fascinated by the "heel first landing", and their focus seems to be directed in wanting to "achieve" a "heel-first" landing all the time.**

**And there's the catch. Even if there are no problems in the hoof, a heel first landing is not always possible!**

**It seems to be of greatest importance to some barehoof followers to see and analyze photographs of horses in all sorts of situations and conclude from the assumed footfall how sound the horse might be. Usually there are three categories:**

- A) Those that land heel first,
- B) Those that land toe-first and
- C) Those that land "flat"

**It seems – since the term "heel first landing" became a fashionable slogan amongst barehoof supporters, all horses and their soundness is assessed by the way their hooves meet the ground.**

**Horses without "heel first landing" as the ultimate proof of soundness, are now deemed to have problems or some sort of trouble, discomfort or weakness in their feet.**

**Only those that land heel first, seem to be the horses without issues.**

**(Surprisingly some of these heel first landers have shoes attached !!!)**

**The heel-first theory has many flaws and if everything would be this black or white, we would have no trouble when we do a gait assessment and lameness diagnosis. (Note: To make a "diagnosis", of course is something reserved for the veterinarian.... we non-veterinarians may make "gait assessments" or soundness assessments without actually naming a problem.)**

**As usual, there is an ideal and there is reality:**

**As long as the foot is attached to the horse, we should not analyze the horse's footfall by isolating the foot from the body and what is happening holistically. And especially not if this analysis is made from a photograph that only captures a millisecond of an incomplete movement!**

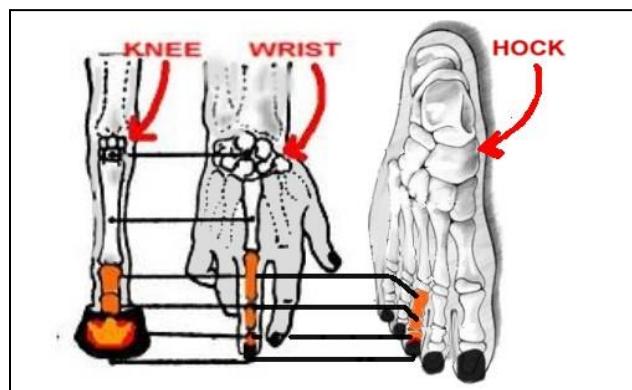
**So, be aware when someone "preaches" about the necessity of a heel-first landing without considering everything else, such as**

- the emotional state of the horse,
- the physical condition of the horse
- the influence of the rider,
- the influence of the tack and
- the terrain conditions

**all the above can determine how the horse needs to place its hoof on the ground!**

**Let's start at the beginning.**

**When we look at the anatomy, and compare it with ours, we soon find that the horse is the ultimate toe walker anyway, because the hoof is actually the nail of the middle digit (equivalent to our middle finger or toe nail):**



**The soft pad of our finger tip would resemble the area of bulbs, digital cushion and frog.**

**The 66 million dollar question is now which part is meant to become weightbearing first?**

**Due to its "open end design", the back part of the horse's hoof (we call it heel area) is more able to absorb and dissipate impact energy (due to its greater ability to deform) than the front part of the foot.**

**So, it seems logical that the horse should be landing heel first in order to take full advantage of this shock absorbing part of its foot.**

**"Hoofmechanism"** (the reversible deformation of the hoofcapsule) however is independent on which area of the foot impacts first, as long as it eventually fully engages and loads, even though expansion should ideally start where the hoofcapsule is the most flexible. (At the rear of the foot).

If the horse is in full flight and has freedom of movement (can move its body free from obstructions, such as a blocking rider, ill fitting tack or muscular and emotional tension OR sluggishness), then the footfall should be heel first in all gaits.

That's the ideal.

In reality, it looks quite different:

To stride forward actively (with a fully extended swing phase) is not always possible or even necessary!

A limb cycle may be flatter and shorter for whatever reason, and therefore will result in a not-heel-first landing.  
(Toe first or flat instead)

This however does not have to be a sign of pathology or compensation to avoid pain in the back of the foot as often suggested!

Unfortunately, I do not have many pictures of horses in motion on my computer to share with you, but if you would have a look at the popular HorseDeals magazine for example, and have a browse through all the pictures, you may realize that 90% of all pictures of moving horses are of horses about to land TOE first.

That does not mean we have an epidemic of totally unsound horses! And those of you who were lead to believe that only horses that land heel first are sound and others aren't, please do not panic!

Only those pictures taken of horses in moments of active extended paces seem to have sufficient toe extension to be able to land heel first.

When it comes to biomechanics, you will realize that it is quite a complex subject, and much more than just the hoof itself is involved in its journey from and to the ground when the horse is in motion.

Biomechanics is actually a "tough" and rather complex topic to tackle because of all the physics and math involved.

But since a horse is not a machine, many other things can influence the footfall:

Please be assured that a toe-first landing may only be symptomatic (of problems in the foot, shod, booted or bare) when it occurs

- a) uninfluenced from physical or mental tension
- b) without the blocking effect of rider or tack
- c) when the horse is moving "forward" actively
- d) in all paces, *most of the time*, when the hoof is becoming weightbearing....

as this would indicate compensation and avoidance of discomfort in the foot.

Stumbling is often associated with such hoof placement.

However, a horse performing high school dressage collection for example, is anatomically and physiologically unable to land heel first, which does not mean it has heel problems!

Let me qualify this type of "collection" first:

What I mean is "ultimate collection", as we would see in a correctly executed piaffe or passage, where the aim is elevation of the forehand.

Using "biomechanical terms" (like *swing phase* etc), it is important to understand that the limb cycle of a horse in motion is influenced by so many things, such as

- excitement, both physical and mentally (of which "collection" in hand and under saddle is the trained expression!)
  - a restriction that causes resistance and prevents the horse from using its body correctly (rider and/or tack)
  - a body injury (muscles, ligaments, tendons, joints – pain elsewhere in the body, not the foot)
  - sluggishness (lack of motivation)
  - weakness, exhaustion, illness
  - the degree of athleticism and confirmation and built
- which all are also relevant when we are trying to analyse motion or footfall.

Shoes or no shoes don't play a great role in the dynamics of heel or toe landing,

other than that the action of the landing-stance-and break-over phases are more jerky and concussive and there is an inability of the hoof to deform medial/laterally.

According to some barehoof philosophies as well as the Biomechanics "guru" Dr. Hilary Clayton, horses try to place the horizontal surface of their coffin bones flat on the ground.

In dressage, the swing phase (forward flight of the limb) is important to the aesthetics of the movement but the leg will be retracted before it reaches the ground. The elbow is the important joint for expression for both protraction (anterior movement) and retraction (posterior movement), coming from the tricep muscle. It is interesting that the elbow is moving a lot more than the shoulder.

Horses demonstrating the expressive "toe-flick" in extended paces and a definite heel first landing with almost an over-extension at the knee (some of you may remember "Farbenfroh" at the Sydney Olympics?) experience a "whiplash" effect, because the elbow has reached its maximum protraction and retraction begins.

The lower leg however is relaxed and is still moving forward! The "whiplash" results and the visual effect is the upwards "flicking" of the toe. Prof. Pollitt has produced a video some years ago, where this is clearly shown in slow motion in a galloping race horse.

**The lower leg is independently relaxed during the swing phase.**

This is important, as this shows that the lower leg is actually independently relaxed during the swing phase.

Now translate the movement into "elevation" rather than forward thrust as it would happen to a collected horse performing a piaffe or passage for example: The toe will point downwards as it is in a "hanging position" ! There is no muscle or pulley system that can pull up the toe so the heel can land first, as the swing phase that bring the toe "up" for a heel first landing does not exist. In that case, the high degree of collection where elevation is of greater importance

than forward thrust of the forehand – (or the swing phase if you wish) is what determines how the hoof is landing.

The same horse doing the toe-first collected work, may be perfectly sound, doing a heel-first landing when it powers across the diagonal in an extended trot!

**Conclusion:**  
Toe first landing is only symptomatic of problems (pain or discomfort) in the hoof if it occurs in all paces, most of the time, when the hoof is becoming weightbearing....

Saying that: Adrenalin can often override actual pain, such as we often see at the race track when the gallopers working in full extension (and heel first landing) around the track, but avoid impact on their heels when moving over the firmer ground of the mounting areas.

You can see that "heel or toe" shoe, boot or bare is not the answer..... nor the question.

There are too many variables that can influence the footfall.

But what is almost certain:  
Upon perceptive observation, you will know if it is a pathology or pain that makes your horse choose to land toe-first, It is too obvious to miss even to the lay person.

Booting and padding may make a difference for a while, but only corrective hoofcare will address the issues that lead to the problem.  
Cure is always better than masking the problem.

Happy toes! ☺

Carola

[www.EquineBareHoofCare.org](http://www.EquineBareHoofCare.org)



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