The Detrimental Effects of Toe Grabs

Thoroughbred Racehorses at Risk

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The Problem
Thoroughbred Race Horse Anatomy

- **Age**
  - Bone structure is not completely matured in 2-5 year-olds
  - Hoof is not completely matured

- **Pastern Length**
  - Long pasterns tend to facilitate underslung heels
  - Underslung heels are correlated to decreased arterial blood perfusion which effects growth rates of the heels

- **Hoof Type**
  - Thin walls and soles, lack of cartilage mass, weak heels

The Mechanics of Toe Grabs

How do shoes with toe grabs effect the leg and foot function?

- When running, they act like a snowplow in the cushion which decreases the normal slide phase of the stride, driving the toe deeper into the track. This unnatural foot position results in a greater degree of fetlock dorsiflexion and coffin joint flexion which causes more strain on the suspensory apparatus structures of the leg.

- When standing, they result in a broken-back hoof pastern axis which facilitates under run heels.

- Clipping heels have catastrophic results.
Phases of the stride: normal and with toe grab

* Drawings recreated from slow motion photographs
Studies conducted at top research centers show that toe grabs increase the risk of injury

Sources:


2001, Underrun heels and toe grab length as possible risk factors for catastrophic musculoskeletal injuries in Oklahoma racehorses. AAEP, vol 47.


Documented Research Results

- **Catastrophic injuries**
  - Toe grabs were present on 90.5% of horses
  - Greater risk of catastrophic injury for long toe, underslung foot types

- **Suspensory apparatus injuries**
  - 15.6% greater chance of suspensory apparatus failure with toe grabs than without

Documented Research Results (continued)

- Harder racetrack surfaces are associated with increased risk for fatal injuries

- $1\text{ billion economic impact}$ of musculoskeletal injuries in the Thoroughbred racehorses

- Up to 83% of Thoroughbred racehorse deaths can be contributed to an exercise-related injury

The odds of injury increase with height of toe grab

<table>
<thead>
<tr>
<th></th>
<th>Low Toes (4mm)</th>
<th>Reg Toes (6mm)</th>
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</thead>
<tbody>
<tr>
<td>Fatal musculoskeletal injuries</td>
<td>1.8 x</td>
<td>3.5 x</td>
</tr>
<tr>
<td>Suspensory apparatus failure</td>
<td>6.5 x</td>
<td>15.6 x</td>
</tr>
<tr>
<td>Cannon bone condylar fracture</td>
<td>7.0 x</td>
<td>17.1 x</td>
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The Effects of a Regular Toe Grab on hard surface

Toe grabs cause a broken back hoof pastern axis when standing on a hard surface.
The Effects of a Regular Toe Grab on hard surface

The elevation of the toe results in an unnatural and unhealthy loading of the bones of the digit when the horse is running.
The Effects of a Regular Toe Grab on hard surface

The toe grab results in an increased tension on the suspensory apparatus and more compression of the heels.

3000 lbs 3000 lbs

3" 1.5"
Flat shoe
XT or 2mm wear plate
Low toe (4mm)
Regular toe (6mm)
High Toe (8mm)
The catastrophic result of clipping heels
Clipping heels
Close up of toe grabs locking
The Solution

- Eliminate the use of toe grabs on front feet
- Continue to fund quantifiable research in equine lameness
- Develop minimum required standards for farriers
- Develop a standardized training curricula for farriers
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