

THE HORSE HOOF: MAINTENANCE PRINCIPLES



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INTRODUCTION AND OBJECTIVE

Horses are adapted to live in wild environments whereas in our society they have become human dependent and live in small, dirty and humid spaces which alter normal hoof function. Once we understand how the hoof works in its natural environment this will allow us to find different solutions for best maintenance in each situation.

HOOF CHARACTERISTICS

The bone (third phalanx) and the hoof are united by epidermal sheets. The wall grows continuously (8-10mm/month) and the hoof tubules give it a flexible consistency, which may vary according to humidity and the region of the hoof.

HOOF FUNCTION

Stabilization, protection of internal structures against exterior elements, traction, proprioception, and damping of about 67% of the vibrations generated at hoof landing by hoof expansion and blood vessel hydraulic absorption mechanisms.

HOOF MECHANICS

Landing forces causes expansion of the hoof and allow the blood to circulate. When the hoof is naturally balanced it hits heel first followed by the whole foot and finally toe push off occurs similar to an elastic spring system that accumulates energy, to release it after each step.

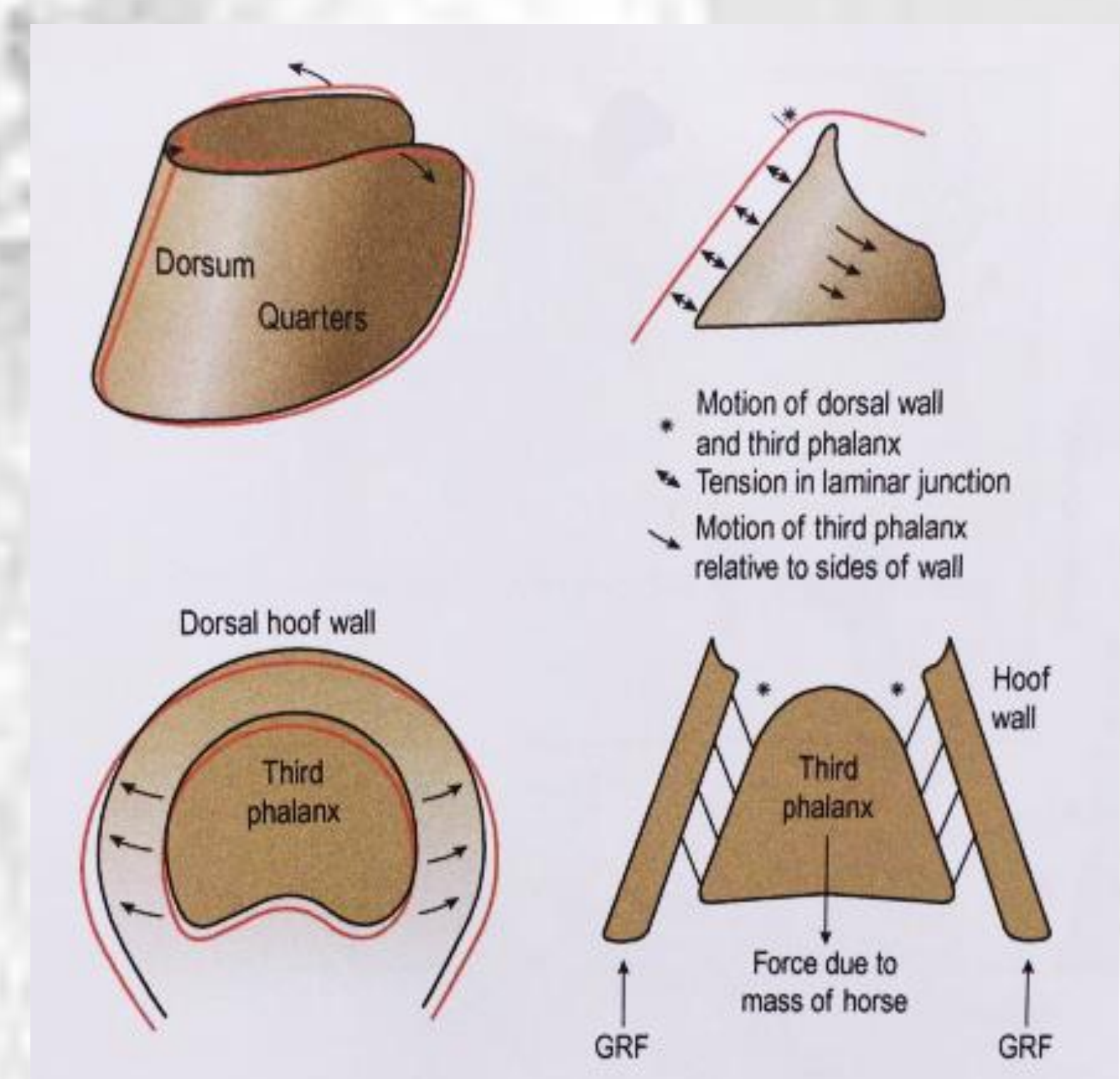




Figure 2. Explanation of hoof mechanisms. The red line represents the loaded hoof, and the black line the unloaded one (Clayton *et al.*, 2011).



Figure 1. Hoof where the wall is removed and the dermis is observed (Craig, M., 2014).

	ADVANTATGE	DISADVANTATGE
HORSE SHOE 	<ul style="list-style-type: none">• Gives hoof wall protection.• Ease of use	<ul style="list-style-type: none">• Restricts the mechanisms of the hoof.• Increase the weight of the distal part of the limb, modifying the kinematics of the locomotion and increasing the shock of impact.• Needs regular changes (6-8 weeks).
BARE-FOOTED	<ul style="list-style-type: none">• Allows hoof mechanics and functions	<ul style="list-style-type: none">• Complicated unless the horse is living in a natural habitat
HORSE BOOT 	<ul style="list-style-type: none">• Allows hoof mechanics and functions.• Less weight than a horseshoe• Does not need to be fixed.	<ul style="list-style-type: none">• Not well known• Needs daily application.• Could be the cause of skin ulcers.

CONCLUSIONS

More studies are necessary to quantify the effects of each system and allow to choose a decision, especially in respect to the horse boots, in order to evaluate how they affect the mediolateral and craneocaudal balance as well as in the distribution of the pressure on the hoof.