Theory: Why do We Roll the Wall?

by James Welz

First, it is important to take a look at a healthy mustang hoof. The healthy mustang's hoof wall is rolled to a varying degree all the way around the hoof wall, including the heel. In fact, the healthiest wild mustang hoof I have seen is rolled so much that, if the horse were to stand on a hard flat surface, the white-line would be the first part of the hard hoof horn to contact the ground—not the wall.

The next thing I would like to call your attention to is the extremely thick wall. It is believed by most that this is genetic. Although I believe there are genetics involved in the thickness of the wall, genetics are not the whole story. The thickness of the wall is also linked to the angle at which the coronet attaches to the hard hoof horn of the wall.

By rolling the hoof wall, we seek to: reduce peripheral loading of the hoof wall; reduce the appearance of compression rings in the hoof; prevent chronic bruising of the hoof wall at the collateral ligaments, heel points, and in conjunction with sidebone; prevent white-line separation; prevent chipping and cracking of the hoof wall; and promote a thicker wall, by allowing the wall's connection to the coronet to descend to a more natural level.

Photos courtesy Pete Ramey

Cadaver hoof from a feral mustang living on extremely rugged terrain, photos by Pete Ramey. Note the extremely rolled form, with the most distal part of the hoof wall being the water line/white line junction. The roll continues toe through heel.

Photos ©The Horse's Hoof

A striking example of the fluid outer hoof wall. The time span between these photos is TWO months (2 trims). The hoof wall has not been rasped except for the roll on the bottom edge. The ripples/ridges have disappeared—and NOT because they have grown out, but because the outer wall relaxed downwards. This horses' diet was unchanged.

What I mean when I say that you should reduce peripheral loading of the hoof wall is that the roll will encourage more of the hoof to share in weight-bearing. The hoof is designed to increase the size of its contact area as the load applied to it increases. As the hoof expands and flexes on weight-bearing, more of every structure will contact the ground. In the specific case of the wall, if the wall was simply rasped flat (such as a typical farrier might do), then the entire wall would always be in contact with the ground, and, in fact, the wall would bear most of the load applied to the hoof, not allowing for adaptation to the level of exertion. It has also been suggested that the hoof wall is fluid, in that it can be moved from its position due to adverse pressure (peripherally-loaded wall). Moving the hoof wall from its natural position will lead to pathology. Simply put, the roll reduces the pressure on the wall.

Compression rings have been seen to significantly reduce with the application of a sufficient roll. I actually have evidence of them reducing in existing hoof wall, that is, before the wall had fully grown out. Some people believe this to be a problem with diet, and diet is probably a factor in all health issues, even with the hoof; however, few of the horses that I have trimmed on a regular basis have undergone any significant change in diet.

The roll also prevents white-line separation. The roll directs the pressure of the hoof expanding on weight-bearing into the wall—instead of the peripherally-loaded wall "pulling away" from the sole. In my hoof mechanism model, the sole, combined with the frog and bars, are responsible for expansion—not the wall. In a hoof mechanism model that relies on the wall for expansion, the load placed on the white-line is excessive, leading to white-line separation.

The angle at which the hoof wall attaches to the coronary corium, not just genetics and nutrition,

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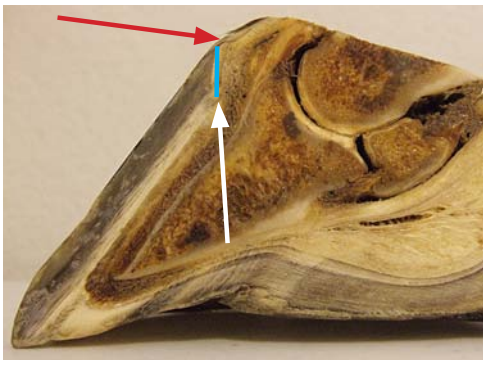
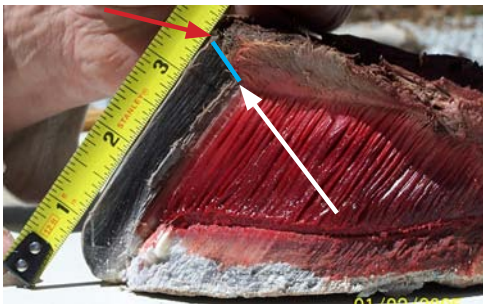


Coronary Pressure: Here is an example of a typical domestic hoof. Due to the chronic peripheral loading, the outer hoof wall has been pushed upwards. This had led to the change in wall attachment. The red arrow indicates the top of the outer hoof wall where it meets the coronary tissues; the white arrow is the inner wall. The blue line indicates the angle of this coronary attachment, which is straight up and down. Upright coronary angle = thin walls. Rolling the outer wall will allow this angle to improve over time, and thus lead to thicker walls.

Photo courtesy Pete Ramey



Lack of Coronary Pressure: Here is an example of a healthy feral hoof. Due to the lack of peripheral loading, and a very rolled outer wall, the coronary band attachment is drastically different. The red arrow indicates the top of the outer hoof wall where it meets the coronary tissues; the white arrow is the inner wall. The blue line indicates the angle of this coronary attachment, which is a very forwards direction angle. This angle is directly proportionate to the thickness of the hoof wall, due to the physics of the equation. Forwards coronary angle = thick walls.

dictates the thickness of the wall. The connection angle of a healthy mustang is less steep than the typical domestic horse. When this angle becomes steeper due to peripheral loading, the hard horn tubules are packed closer together, allowing for less room for the softer connective horn. This leads to a thinner, more brittle wall. When we roll the wall, we are trying to provide enough relief to the epidermal wall that, over time, this connection angle will become flatter, or relax, allowing the hard horn tubules to spread, and allowing for more of the softer connective horn—which should lead to a thicker and more flexible wall.

I typically see a few types of chronic bruising in hoof walls that have not been rolled: chronic bruising at the heel turn around points; at the collateral ligaments; and in conjunction with sidebone. These bruises are all the result of the coronet connection angle becoming too steep. The tissue of the coronet under the hard hoof horn in these areas, due to the tighter connection of the coronary corium at the collateral ligaments, heel points, and any calcification of the lateral cartilage, is stretched, sometimes to the point of tearing, due to a peripherally loaded wall. The blood released is encapsulated in the hoof wall as it grows downward. This is, of course, typically only visible in a white hoof. I believe that the epidermal wall grows faster than the dermal wall, compounding this situation. The simple solution to this situation is to **roll the wall**.

Photos ©The Horse's Hoof

Two types of chronic bruises that are the result of excessive peripheral loading in the heel walls.

Photos ©The Horse's Hoof

Some roll the wall only for cosmetic reasons, or to "copy" a wild horse hoof. Others criticize rolling the walls for these very reasons—even claiming it to be harmful. In contrast to this, I roll the walls specifically for a mechanical function only, with outstanding results. In the end, the hooves are beautiful, but form follows function. *Good structure is beautiful.* This is the hind hoof of a PRE (Spanish) mare.

About the author: *James Welz has been a professional trimmer since 2000, and that same year created* The Horse's Hoof *with his wife, Yvonne. For more information about the Welz system of trimming, including both Theory and How-To information (articles, videos, photos, plus a forum where you can post your photos and ask us questions), visit Hoof Help Online at* ***www.hoofhelponline.com***