

Farrier Loncie Tucker of Noble, Oklahoma, secures a wooden shoe to a laminitic horse's hoof during a recent shoeing demonstration.

GOING Dutch

**The wooden rocking
horseshoe is helping many
horses survive laminitis.**

"TOOTER" KISER REMEMBERS THE DAY IN 2004 THAT HIS GOOD RANCH HORSE, PEPPERONI Wolf, came walking across the lot, just looking a little stiff. He didn't know it then, but that was the beginnings of a case of laminitis in all four feet that very nearly spelled the end of "Pepperoani."

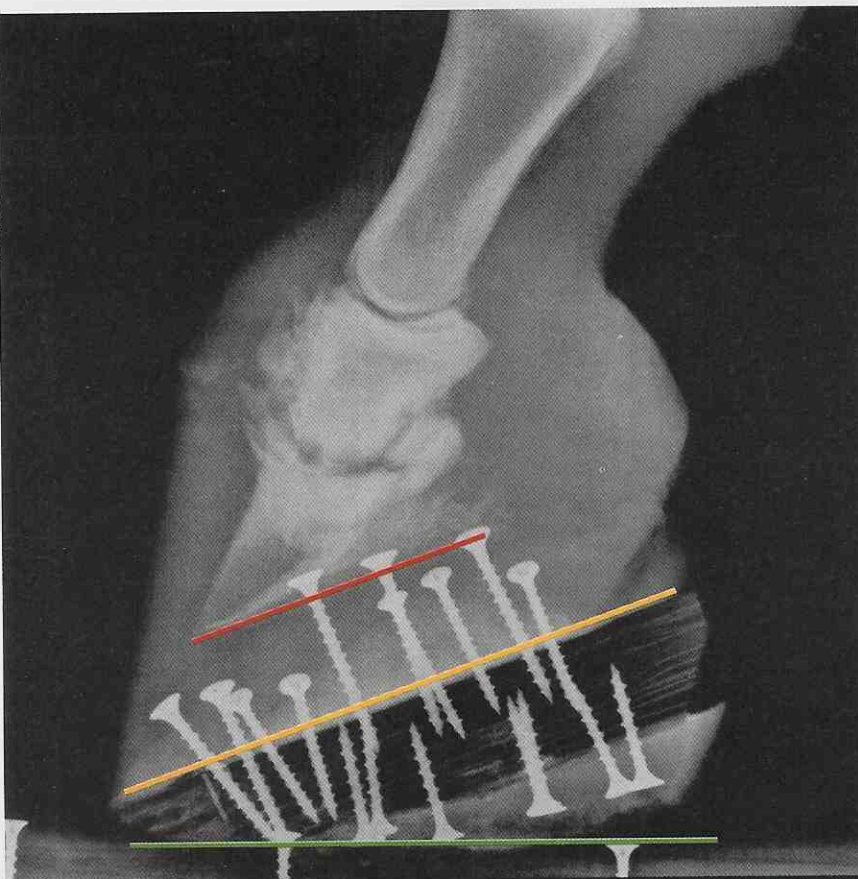
Tooter, who lives in Sulphur, Oklahoma, took the horse to his regular veterinarian, where he got the diagnosis and a recommendation to take the horse to a local sale, where he'd most likely go to a slaughter house.

"I said, 'Hey doc, this is a little better gelding than what you give him credit for,'" Tooter says. He didn't want to put the horse down, nor did he take him to the sale barn, but he left the vet's office downhearted and unsure of his next option.

Then from two different people, he heard of a veterinarian just 60 miles away in Shawnee, Oklahoma, who was putting wooden shoes on laminitic horses and having some success at it. Tooter and his wife, "Sissy," even got their hands on a video of Dr. Micheal Steward working on some horses.

"We looked at each other and said, 'What have we got to lose?'"

When Tooter took Pepperoani, a grandson of Peppy San Badger, to Dr. Steward, the little red roan gelding could barely walk off the trailer. But by the time Dr. Steward and a farrier finished with him, "I led that horse out of that X-ray room and he hit that concrete and gravel, and he gave just a *little*. It was like he was already 95 percent better," Tooter says.



This digital X-ray shows how wooden shoes can help align a horse's bony column, while still protecting the stressed deep digital flexor tendon. The red line shows the level of the coffin bone, or third phalanx, as being parallel with the horse's sole (shown by the yellow line). That alignment helps restore blood flow to the damaged foot. But by wedging the heels of the wooden shoe, those structures don't necessarily have to be parallel with the ground (shown by the green line), which removes stress from the deep digital flexor tendon.

Pepperoani continued to improve, and today, he's wearing regular shoes and is back helping Tooter work cattle on the 15,000-acre ranch where he lives.

"Where we live and work, it's not a rough place, but it is pretty rocky," Tooter says. "I ride him hard, and he has never come up crippled. I have had zero trouble with him."

He's a firm believer now in the wooden shoes.

"It worked for us. (Dr. Steward) fixed my roan horse, and I'm sure glad he did," Tooter says.

To the uninitiated, these screwed-on shoes can look pretty strange, even prompting a few "Frankenhorse" jokes. But to Pepperoani and other horses they're helping, it's no joking matter.

To understand how the wooden shoes work, it's helpful to first review the mechanics of laminitis. (See the January 2007 issue of *America's Horse* for a more detailed look at the disease.)

Laminae are the soft tissues that anchor the coffin bone, or the third phalanx, to the inside of the hoof wall. They, in effect, are the main support system for the bony columns of the horse's legs. When laminitis strikes – from a multitude of causes, including grain overload or overweighting one foot to compensate for soreness in the other one – the laminae become inflamed.

As they swell, blood flow within the hoof is compromised. And as the laminae die off, the coffin bone loses its attachments to the hoof wall. Without that counter-balancing force, the deep digital flexor tendon, which runs down the back of the leg and attaches to the bottom of the coffin bone,

exerts enough pressure to rotate the coffin bone downward, so that it points toward the bottom of the foot. It can also sink within the hoof capsule, to the point that it comes through the bottom of the sole.

Laminitis is considered a medical emergency, and as you might guess, there are some horses with it who can't be saved.

But this is where Dr. Steward delights in stepping in.

Some laminitic horses "need to (be euthanized) because they're in so much pain, and it's very selfish of us to keep them alive," he says. "But having said that, we typically save 99 percent of them."

One client brought him a horse whom two other veterinarians had recommended be euthanized.

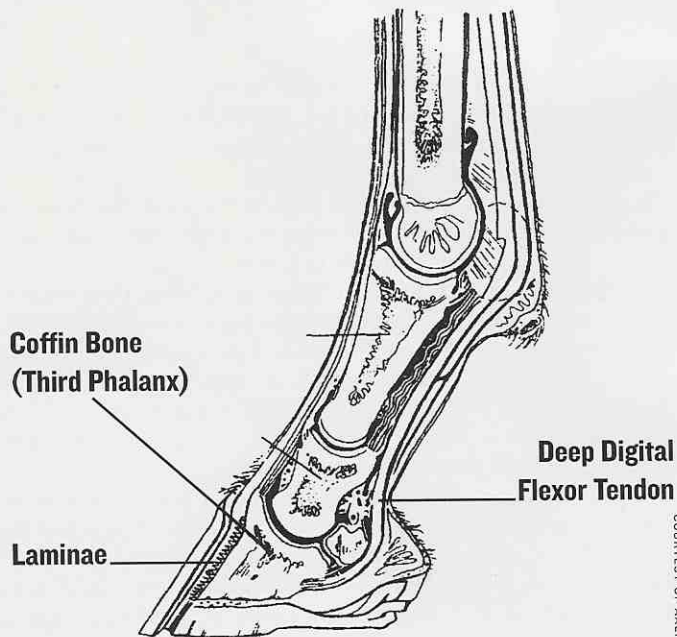
"I was the first guy to come along that said, 'Kill it? Let's ride it.' I've given some hope. If (the hooves) have blood supply, we can usually make it work real good," Dr. Steward says.

His weapon of choice consists mostly of plywood and some deck screws.

The plywood typically comes in 1.125-inch thicknesses, and several layers of it can be used to create a shoe that resembles the square-toed, rockered Natural Balance shoe. Farriers use an adjustable band saw or a belt sander to create a 45-degree angle on the toe of the shoe and a 30-degree angle on the heel side. The bottom is left flat, to provide stability. Dense rubber can also be used on the bottom for better traction, and

commercial versions, made of different material, are also available.

Dr. Steward first tried a crude version of the concept more than 20 years ago, when he screwed a plain piece of plywood on the hooves of a horse whose coffin bones were





The finished product: This hoof has had the fiberglass casting material wrapped around it, topped with a layer of self-adhering elastic bandage.

coming through her soles and whose owner couldn't afford expensive treatments.

Three months later, that horse owner brought in a sound mare – whose wooden shoes were beveled off by wear in exactly the patterns Dr. Steward uses now.

"I didn't invent them," he says. "I just discovered them when the horse showed them to me."

But what is now known as the "Steward clog" actually has been around for a long time. After Dr. Steward had been using the wooden shoes for a while, a client brought him a copy of "Magner's Classic Encyclopedia of the Horse," which was originally published in 1887. In it, he found a description of a "rolling motion" shoe fashioned out of metal that was very similar to what he'd been using. And it also substantiated one of Dr. Steward's convictions.

"It has taken me 20 years to figure out what they knew back then, which was No. 1, do no harm."

In his modern-day interpretation of that, the screws, set in with a cordless drill, don't add trauma to an already-injured hoof like hammered-in nails would.

He likens it to someone with a concussion who goes to the doctor, only to have the doctor hit him in the head with a hammer.

"These guys are so critically ill, just one pounding of your hammer can be the difference between life and death. Any injury results in more inflammation," Dr. Steward says. And the screws can be removed and reset to adjust the shoe as necessary without adding any more trauma.

But before the shoes are set on, X-rays are essential.

The radiographs of the feet and lower legs show how much the coffin bone has rotated and whether it has dropped to one side or the other (medially or laterally). The thickness of the front hoof wall and the thickness of the sole are among other parameters that help the veterinarian and farrier formulate a plan.

Of course, there are many things to take into consideration, but one that's of paramount importance is de-rotating the coffin bone by lowering the horse's heels. It may not be possible to put the bone back in its rightful position in one trim, but every little bit helps. When the bone is de-rotated, that takes pressure off the blood vessels that were compressed by its rotation and helps restore blood flow to the foot.

But the laws of physics don't always work in favor of a laminitic horse. When the heels are lowered, that often tightens up an already tight deep digital flexor tendon, creating pain. So wedged heels are incorporated into the shoes, propping up the back of the feet and taking the pressure off the deep digital flexor tendon without affecting the new position of the coffin bone.

Dr. Steward also tries to bolster blood flow to the foot in another way, similar to the 1880's tradition of packing oakum into a laminitic hoof. (Oakum is loose fiber, usually mixed with tar, historically used to caulk the seams of a ship.)

With input from Gene Ovnick, who developed the Natural Balance shoeing system, Dr. Steward began using rubber-like impression material, which is malleable until it "cures," to fill in the crevices around the frog and over the sole.

He recalled horsemen of the past who said horses had two hearts – one in their chests and another in their feet. And indeed the vascular system in the hoof plays an important role in dissipating concussion when the horse is moving. As concussive forces move through the hoof, the energy is dispelled into the fluids of that "hemodynamic system."

So, for the injured laminitic hoof, adding this firm cushion to the bottom of the foot is a bit like performing CPR, helping blood flow in and out of the hoof as the horse moves and distributes weight on and off its feet, Dr. Steward says.

The better blood flow the hoof has, the more it's able to grow healthy sole that will protect the compromised coffin bone, he says, and that's crucial to recovery.

Dr. Steward says another very important factor is breakover, or the point in the stride at which the foot "breaks over," or rolls forward.

If the hoof breaks over at a point toward the front of the foot, more force is applied to the deep digital flexor tendon at the back of the leg – which worsens the laminitic horse's pain. But if the breakover point is moved back, toward the middle of the hoof so that the hoof rolls easily over in the stride, the horse is much more comfortable.



The screws that attach the wooden shoes do not penetrate any sensitive structures, and many of the screws actually just rest against the hoof wall and function as strut supports to improve the stability of the shoe.

