Amazing equines!

Discover how your horse is put together and tailor his care to ensure he stays happy and healthy for life

To many of us, horses are beautiful to look at and appear to have great intelligence. They certainly have the ability to tune into human emotions – but in reality they're so much more. As experts continue to delve into the horse's physical makeup we're discovering more and more about their ability to carry riders, perform complex dressage movements and jump the biggest of man-made fences.

Over the page our expert, biomechanics pro Russell Guire, reveals some surprising facts about our horses' physiology and how they cope with the stresses and strains of life as domesticated animals.

Prepare to be shocked, amazed and fuelled with ideas to ensure your horse goes on to have a long and healthy life with you.

OUR EXPERT

RUSSELL GUIRE is an expert in equine and human biomechanics. He founded Centaur Biomechanics, which specialises in horse and rider performance analysis. He runs workshops around the world, helping riders understand how their position in the saddle influences the horse. Visit www.centaurbiomechanics.co.uk

PHOTO: BLICKWINKEL/ALAMY

The equine body is a complex and beautiful machine, capable of some truly incredible things

You can spot whether your horse is left or right hooved by observing his stance while grazing

Is he left or right hooved?

From birth, horses are either left or right hooved (that's handed to you and I). When you watch your horse grazing he'll graze with one foot out in front and this tells you whether he favours the left or right. Often referred to as laterality, this is the preference your horse shows for one side of his body, and being aware of this will help you use the correct training exercises to help strengthen his weaker side.

Favouring one side to the other can cause asymmetry, altering foot shape and scapular position. This is why regular visits from your farrier and having the fit of your saddle checked at least twice a year are essential to ensure your horse stays sound. If this doesn't happened it may result in uneven feet and uneven loading patterns which, over time and if not corrected, will cause weakness and soundness issues.

Too close for comfort?

Right below where you sit, just beneath the surface, is your horse's spine. It's part of a complex design of bone, muscle, ligaments and tendons, which all work together so your horse can support your weight when you're riding him. Your horse's spine is protected by a layer of muscle called the longissiums dorsi. Feeding your horse from the floor will help to stretch these muscles and keep your horse's back in good condition.

Missing the mainframe

Unlike us, horses don't have a collarbone, but instead have a powerful group of muscles, tendons and ligaments called the thoracic sling, which attach your horse's torso to his shoulders. The thoracic sling acts as a shock absorber and it's this that enables horses to carry out dressage movements and jump. If horses had a collarbone they'd struggle to jump or carry a rider.

All seeing eyes

The horse has the largest eyes of all land mammals, and their position on the side of their head allows them to see through 360°. They also have one flight eye and one processing eye. You'll often see a horse tilting his head at a strange object in his field of vision – and this is him looking and processing what he's seeing. This also helps explain why on one rein your horse won't notice an object in the school, but may spook or shy on the opposite rein as his vision on each rein sends a different message to the brain.

The 'bow and string' effect

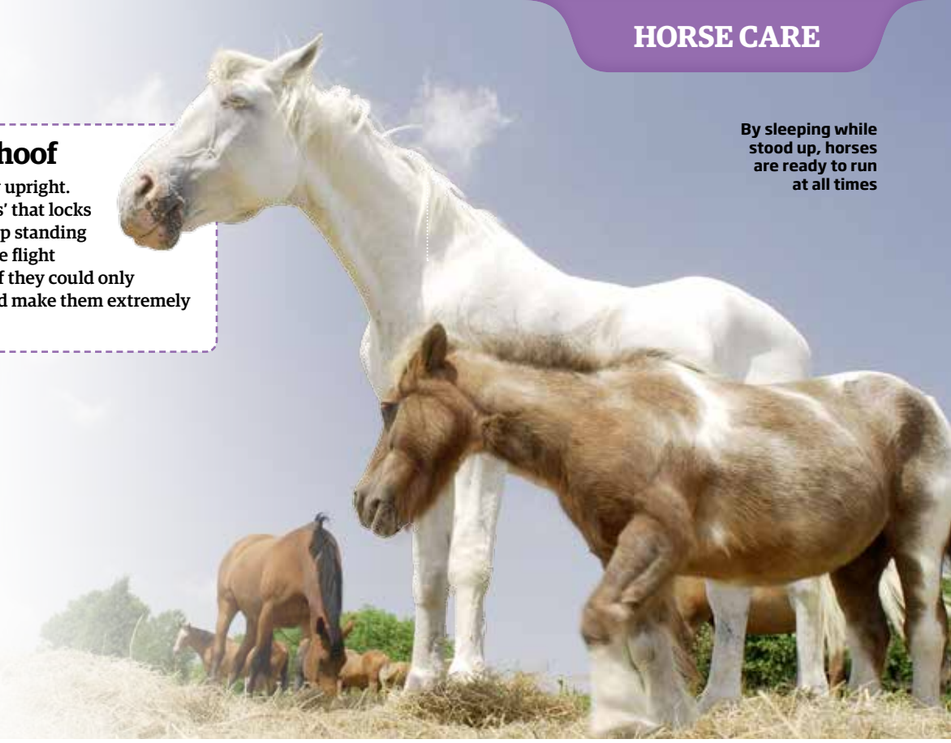
The way your horse's back works is referred to as the 'bow and string' theory. His spine is a bow that's held in place by tension on the string, created by his abdominal wall. Contraction of this wall of muscles tenses the bow to create flexion or rounding of the back. The same happens when your horse engages his hindlegs.

The string is tensed – ie his back extends or hollows – due to the protraction of his forelegs and retraction of his hindlegs.

The string is also tensed by the weight of his organs inside his abdomen. Think of an old broodmare with a sunken back and dropped belly.

Sleeping on the hoof

Horses are designed to stay upright. They have a 'stay apparatus' that locks their limbs so they can sleep standing up. This allows them to take flight if a predator comes along. If they could only sleep lying down this would make them extremely vulnerable in the wild.



By sleeping while stood up, horses are ready to run at all times

Clever compensation

Scientific research has shown that horses will adapt the movement of their fetlock to compensate for weakness. If one fetlock is less dropped, or is hyperextended, as your horse puts his weight into it than the others it indicates this is his weaker leg. This can help us identify lameness issues by watching the fetlock rather than the usual head-nod or irregular stride length.

Tipping the scales

Horses can cope with extreme changes in weight on their back. During trot, for example, two times our weight comes down onto our horses, and this grows to three times our weight when we're in canter.

Horses are so sensitive they can feel a fly land on their skin, so there's no reason why they shouldn't react to your aids

Sensitive to touch

Your horse is so sensitive to touch he can feel a fly land on him, so why do some horses become un-reactive to the rider's leg? Horses have a great ability to switch off, and this is what happens if you continually apply a leg aid. Eventually your horse will become dull to your requests.

Landing gear

When a horse jumps a 1.30m fence, 2.6 times his bodyweight passes through his first landing foreleg. As he lands, his fetlock hyperextends (touching the ground), and his tendons and ligaments stretch like a large elastic band. This load passes into his fetlock, acting like a huge spring propelling him forwards.

Feel the force

Horses are subjected to two-g of downward force (g-force is a measurement of acceleration that produces weight) on their spine in trot and a staggering six-g in canter. Compare that to a dragster car that can accelerate from 0 to 99mph in 0.86 seconds and exerts roughly five-g when it's accelerating.