

Special horseshoes measure acceleration in horses

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The most frequent injuries that horses suffer are derived from pressure exerted by riders, and knowing which forces are involved when horses move can prove highly informative when considering treatment for such injuries.

A team of scientists from Wageningen University, led by Professor Johan van Leeuwen, has carried out studies both into the advantages of different rider techniques in reducing injury risk, and into the benefits of a method of equine rehabilitation.

By using computer modelling and specialist horseshoes to measure acceleration, these investigations suggest that aqua-training rehabilitation is beneficial due to lower impact accelerations. However, rising trot may not be as advantageous as previously thought. Results will be presented on Monday 7th July at the Society for Experimental Biology's Annual Meeting in Marseille.

Rehabilitation after equine joint and muscle injuries, including those of the back, shoulders and legs, now often involves 'aquatraining', whereby horses move in water-filled treadmills. Due to buoyancy, this treatment is currently thought to reduce weight-bearing forces, which can otherwise have detrimental effects on joints, but to date there has been a virtual absence of studies into the magnitude of these benefits.

Professor van Leeuwen's team has used special horseshoes to measure accelerations of horses undergoing aquatraining, as well as walking

normally, which provide a good indication of the impact forces involved.

"Our results, based on data from seven horses, show the accelerations are significantly lower during 'aquatic walking'," he asserts. "We will be carrying out further experiments to confirm these results, but at this stage, it appears that aquatraining may indeed be beneficial for rehabilitation after joint injury."

Professor van Leeuwen and his colleagues have also used specialised force gauges to measure the strain placed on the backs of horses through the saddle and stirrups. These measurements have been combined with the output of computer models to provide insight into the mechanisms that a rider can use to respond to the movements of a horse, and to prevent injury.

"We have given particular attention to the comparison of sitting and rising trot, as it is broadly accepted in the equestrian world that rising trot imposes less loading on the back of the horse," Professor van Leeuwen explains. "However, our results have not been able to confirm the belief that rising trot is mechanically less demanding for the horse. Looking at back extension, which is most often related to back injuries, we found that the extension of the back is similar in rising and sitting trot."

Source: Society for Experimental Biology

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