# The "Happy Equine Athlete": How the Science of Equitation seeks to Improve the Welfare of Horses

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## Introduction

The Fédération Equestre Internationale (FEI) has introduced the concept of the "happy equine athlete" following recent complaints regarding the use of "Rollkür" (over-bending), more officially termed hyperflexion, as a technique used in warming-up elite dressage horses. This attention has raised further questions regarding all training methods used across the equestrian disciplines that could jeopardise horse welfare and may be responsible for some wastage of young horses in training.

## Discussion

Negative reinforcement, a form of operant conditioning, underpins the training of horses via a pressure-release system (i.e., when the horse produces the desired response, the aversive stimulus is removed, McGreevy and McLean, 2007). However, there is evidence that this process is poorly understood by both riders and trainers, partly because data from other species in learning studies are of limited use in equitation. At best the use of aversive stimuli in negative reinforcement is very subtle, but lack of understanding often results in unnecessary pressure being used, resulting in behavioural and physiological manifestations.

These issues were addressed by McGreevy (2007) in his review of Equitation Science, an emerging discipline that combines learning theory, physics and ethology in evaluating current training techniques. This paper explains the importance of equitation science and how it will advance training methods by focusing on the mechanisms rather than the outcomes of equitation. The changes required to improve horse welfare can then be made on the basis of learning theory and quantitative means. The use of measuring devices will define the optimal range of stimuli currently used in equitation, measuring variables such as rein tension (contact) and the transmission of seat and leg pressures, which will, in turn, allow lameness and performance problems to be related to degrees of asymmetry. Variables such as thresholds of tolerance, particularly regarding cervical flexion, and discomfort will also be measured to learn what is acceptable pressure. This paper acknowledges the difference between modern competitive dressage in which the focus is on lightness, and classical dressage demonstrating impressions of power.

Understanding learning theory and appropriate use of negative reinforcement will avoid the misconception that increased pressure and use of gadgetry is necessary to get results. Failure to escape pressure produced by excessive rein tension can result in the horse developing a state of learned helplessness, described as learned pain tolerance (McLean, McGreevy & Jeffcott, 2006) where it learns that there is no means to escape. Conflict behaviours and habituation may also result, which, in turn, can lead to bolting, compromising safety and welfare. By recognising and eliminating these behaviours, we can reduce wastage and the potential for injury (McGreevy, 2007).

With a focus on habituation, a study was conducted to determine the appropriate rein contact required for specific movements, in particular the lower range of tensions (Warren-Smith *et al.*, 2007). Twenty-two horses of various breeds and training history underwent a standard course of right and left turns, going straight and a halt. Tensions were measured in Newtons (N) via embedded load cells within the reins. Mean rein tension was greater for long-reining (10.7N ± 1.0N) than that for the ridden test (7.4N ± 0.7N) (P=0.025). However, this was thought to be due to the greater length of the long reins and did not predict tensions required for the ridden test. Tension required to elicit the halt response was greater than for any other response (P=0.001). The mean tension recorded at trot was 9N. This trial demonstrated that these responses can be achieved with far lower tensions than previously reported (up to 60N), which is an important finding from a welfare perspective. A rider effect was also evident, as the least experienced rider exerted the most tension, highlighting the need for further investigation of this finding.

The key issue addressed by this study is the variation in perception of pressure by riders, trainers and judges and therefore the need for increased awareness. This is an important consideration due to the varying degrees of severity in the bits used in equitation. For example, double bridles used in dressage consist of a bridoon and a curb bit, the latter exerting pressure on the poll via the headpiece and curb-chain in the chin groove. These bits can be used independently or in combination (Clayton, 1985). Education and awareness would help to decrease the incidence of bit injury and clinical conditions such as dorsal displacement of the soft palate and facial neuralgia that may arise from excessive bit pressures (Warren-Smith *et al.*, 2007).

The use of positive reinforcement in equitation is rarely feasible and timing is essential to ensure that the correct behaviour is reinforced. One study of 20 horses evaluated the effects of a blend of positive and negative reinforcement in shaping the halt response (Warren-Smith & McGreevy, 2007). Horses were paired and assigned to a group receiving either negative reinforcement only (control) or a blend of positive and negative reinforcement (treatment). All were fitted with a reward device designed to deliver molasses water but reinforcement occurred according to group allocation. Results showed that treatment did not affect latency to halt but there was an improvement in roundness of outline, increased tendency to lick their lips and less vertical head shaking in the treatment group. Roundness of outline was not significantly different in the two groups but the authors attributed this to the small sample size. Further investigation into the use of positive reinforcement in training is warranted by these results because a steady head carriage, acceptance of the bit and roundness of outline are desirable in equitation and positive reinforcement may avoid the perceived need to use increased bit pressure or gadgetry.

## Conclusion

The findings described draw attention to the need for greater understanding of how horses learn, the appropriate use of pressure-based signals and the integration of positive reinforcement in order to develop more effective training methods that decrease behavioural wastage and enhance welfare. The technology is now available and with further modification and investigation, can be used by trainers, riders and judges to provide objective measurements and ensure the correct range of pressure and tension is used.

## References

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