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## Equitation Science: ‘The Road Ahead’

### *Ten minutes of Low-Deep-and-Round may result in acute stress responses*

Dutch and Danish researchers presenting at the 10<sup>th</sup> Equitation Science conference currently underway in Edinburgh, Scotland, have found that compared to other head and neck positions, horses ridden in hyperflexion, or “low deep and round” are likely to be exposed to higher levels of physiological stress.

Previous studies explored the effects of the hyperflexed head and neck position on the stress and behavioural responses of horses on the lunge or a treadmill. This study measured a variety of behavioural and physiological responses of horses ridden in hyperflexion and two other common head and neck positions.

15 Danish dressage horses training at medium to Grand Prix level and routinely ridden in the hyperflexed head and neck position were used. In addition to hyperflexion, low deep and round, the standard “on the bit” or competition frame and loose frame in which there was less tension in the reins were also investigated. Each rider performed a pre-determined riding test of 10 minutes duration in walk, trot and canter in each of the three head and neck positions, randomised over the three days of testing.

Heart rate, heart rate variability, salivary cortisol concentration, behaviour and the tension in reins were recorded during the 10-minute test period. Salivary cortisol concentrations were measured 60 minutes before and 0; 5; 15 and 30 minutes after the test.

“This study is the first to test whether there is an acute stress response to the hyperflexed head and neck position in horses ridden in a typical training environment” said Dr Machteld van Dierendonck from Utrecht University. “We found that the increase in salivary cortisol concentrations from baseline were significantly

higher after 10 minutes of riding in the hyperflexed position than the increases observed in the competition head position or with the loose frame.“

Cortisol is known as the ‘stress’ hormone and increased cortisol concentrations are routinely used to quantify stress responses in animal welfare studies.

“We didn’t find any significant differences in heart rate, and heart rate variability between the treatments, but we did find that certain behaviours were higher during hyperflexed riding than the other head positions. Rein tension during the hyperflexed and competition head position was significantly greater than during the loose frame position.”

“Compared to previous studies which have used side reins to maintain the hyperflexed position, the low, deep and round position in this study was less hyperflexed.” she said.

“We wanted to test the horses’ response to this method in a typical training environment. Within the parameters of this training situation, we found that the use of the hyperflexed head position, even in horses routinely ridden this way could result in a physiological stress response as measured by salivary cortisol concentrations.”

“Interestingly, riders indicated a loss of balance and steering control in the loose frame”.

Head and neck positions has been the subject of controversy with the FEI conducting two reviews in recent years.

This study was a joint work with Danish and Dutch universities. Janne Winter Christensen from Aarhus University in Denmark, along with Mirjam van Dalum, Mandy Beekmans from Utrecht University were joint researchers on this study.

The International Society for Equitation Science (ISES) is a not-for-profit organisation that aims to facilitate research into the training of horses to enhance horse welfare and improve the horse-rider relationship. [www.equitationscience.com](http://www.equitationscience.com)

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