

The Science of Equitation

Conference findings have important implications for the dressage sport, equine management

By Hilary M. Clayton, BVMS, PhD, Diplomate ACVSMR, MRCVS

This year marked the eleventh annual conference of the International Society for Equitation Science (ISES). For the first time, the conference was held in Canada, at the University of British Columbia in Vancouver, with the demonstration day at nearby Southlands Riding Club.

The theme of the 2015 conference, “Ethical Equitation for All Equestrian Disciplines: Breaking Barriers and Building Bridges,” was intended to

Horse Assessment

An investigation of equine coat color bias in assessment of potential performance horses

Anna Fisker Hansen, Plymouth University and Duchy College, United Kingdom; Hayley Randle, Duchy College, UK; Joanna Dixon, Duchy College and Plymouth Marine Laboratory, UK

Many people are attracted to horses of a particular color, but do our color

In the seven-year study (2008–2014), researchers analyzed futurity results for 4,001 horses and conducted an online survey of British equestrians’ preferences in horse coat colors. Of the horses analyzed, 2,218 were bay, 773 were chestnut, 345 were black, 298 were spotted (Appaloosa, roan, gray), 241 were block-colored (pinto), and 126 were diluted colors (dun, buckskin, palomino).

When evaluations for the sports of dressage, jumping, eventing, and endurance were combined, block-colored and spotted horses had significantly lower mean premium scores as compared to all “solid” coat-color groups. In 1,608 horses evaluated as dressage horses, spotted horses had the lowest mean score, followed by block-colored horses. The completed questionnaires indicated that block-colored and spotted were the least favorite horse colors. In combination, these results suggest that a negative bias against block-colored and spotted horses may influence subjective evaluations of potential sport horses.

Subjective scoring of ridability by professional riders: Is it linked to rein tension and occurrence of conflict behavior?

Janne Winther Christensen, Aarhus University, Denmark; Rikke Munk, Aarhus University; Lesley Hawson, University of Sydney, Australia; Uta Koenig von Borstel, Georg-August University Göttingen, Germany; Lars Roepstorff; Agneta Egenvall, Swedish University of Agricultural Sciences, Sweden

Many breeding organizations include subjective scoring of ridability in their evaluation of sport horses. This study investigated whether professional riders agree in their scoring of ridability, and whether rein tension and horse “conflict behavior” reflect the scores given by the test riders.

Ten professional female riders each rode 10 dressage horses that were trained to level M on the German scale. A standardized dressage program consisting of a 10-minute warm-up followed by a five-minute test was performed, and the riders then scored



HORSES NEED SLEEP, TOO: *Equine sleep patterns may impact performance*

signify the transitioning of equitation science from academia into practice and to indicate that the message of equitation science is applicable to equestrians in all disciplines. The presentations covered a wide variety of topics. I’ve picked a few that I thought are interesting and relevant to dressage, and I’ve summarized their contents in this article. The entire proceedings can be downloaded from the ISES website at EquitationScience.com/proceedings.

preferences affect our judgment of the quality of the horse?

In some sports, a judging bias based on the athlete’s uniform color has been shown. This study was designed to test whether judges of young horses at the British Equestrian Federation’s young-horse evaluations showed a bias according to horse color. The outcome of these evaluations potentially affects the value of the horse and thus has economic implications for breeders and owners.

the horses for ridability on a scale from zero (poor) to 10 (excellent). Two riders per day rode each horse over the course of the five-day study.

There was considerable variation in the ridability scores. The horse with the greatest variation received scores ranging from one to eight. Rein tension also showed considerable variability when a horse performed the same test with different riders. Conflict behaviors—which included head shaking, head nodding, shying, bucking, rearing, and kicking—showed a significant correlation with rein tension. Horses with high rein tension showed more conflict behaviors. Ridability scores did not depend on the level of rein tension, but a higher frequency of conflict behaviors was associated with lower ridability scores.

Is it possible to judge whether a horse is a happy athlete?

Natalie Waran, University of Edinburgh, Scotland

Ever since the phrase “the happy athlete” was introduced into the FEI dressage rules (Article 401.1), there have been discussions about what this phrase actually means and whether it is possible to recognize and reward happiness in horses. Some people have questioned whether a horse needs to be “happy” to perform a high-scoring dressage test. It is debatable whether the horse’s “happiness” is expressed in a manner that is recognizable and that can be assessed visually during a competition performance.

There are many views on the causes of happiness in people, but it is generally agreed that being happy relates to participating in pleasurable activities, having good social relationships, feeling engaged in life, and feeling as if life has meaning or purpose. Happiness is perceived as a positive state of mental well-being and is correlated with a having a good life.

Research into positive emotions in domestic animals suggests that a positive emotional state is associated with certain behavioral indicators, such as levels of play, performance of affiliative

behaviors, and, for some species, the use of specific vocalizations or changes in facial expression. Humans show emotion through body language and facial expressions, with signs of positive emotions including smiling and laughing. In horses, we recognize the quivering upper lip while being groomed or scratched by another horse as a sign of pleasure. Nicker also may be a sign that a horse is pleased to see another horse or a familiar human. With regard to equine facial expressions, research is

in progress to investigate whether horses have consistent expressions that indicate a positive state of mind.

It is recognized that the way many sport horses are kept restricts their ability to engage in normal equine behaviors, which may have a negative impact on their quality of life. To avoid this, it is recommended that horses be turned out with sufficient space to move freely in different gaits. Having the companionship of another horse allows them to express social behaviors, such as mutual

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grooming, that they find pleasurable. In some countries, the welfare of the horse as a “happy athlete” is one of the main values in those nations’ strategic dressage plans. How successfully this can be achieved in dressage judging and training, given that there is little to no use of objective evidence regarding measures of positive emotions in horses, is currently debatable.

A positive state of mind may have beneficial effects on health. People who are happy and have positive emotions have lower heart rates and lower levels of stress. Although we don’t know whether the same is true in horses, we do know that stressed horses show high levels of circulating cortisol; exhibit a lot of conflict behaviors both in the stall and under saddle, such as stall-walking and bucking; and have lower immunity to diseases. Even though happiness may be difficult to recognize in horses, as their caretakers we are obliged to do our utmost to fulfill their psychological needs in order to ensure their mental and physical health.

Judging

Subjective judging systems: A review of the dressage scoring system used at the London 2012 Olympics

Claire Heap, Hartpury College, UK; and Victoria Lewis, Hartpury College

In the past, dressage at the Olympics was judged by five judges seated at E, H, C, M and B. Variation among the scores may result from the judges’ positioning affecting visibility of the movements, nationalism, home advantages, expectation bias, and an effect of the order of go.

In an attempt to improve objectivity, for the 2012 London Games the *Fédération Equestre Internationale* (FEI) added two judges, positioned at K and F, and a separate supervisory panel to oversee the judging decisions. This study reviewed data from those Olympics to determine whether the new judging system affected the team and individual results.

The new system was determined to

have made no significant difference in the average marks awarded to individual competitors in the Grand Prix and Grand Prix Special tests. Neither the team medals nor the individuals progressing to the Grand Prix Freestyle were affected by the addition of the two judges and the supervisory panel. The authors suggest exploring alternative methods to make dressage judging more objective, such as discarding high and low marks or using targeted judging for specific parts of the test.

Management Practices

Assessing the influence of twitching during a potentially aversive husbandry procedure (ear clipping) using behavioral and physiological measures

Ahmed Ali, Michigan State University, USA, and Cairo University, Egypt; Katelyn Gutwein, Michigan State University; Paula Hitzler, MSU Horse Teaching and Research Center, Michigan State University; Camie Heleski, Michigan State University

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EXTRA EYES: *The London 2012 Olympics introduced the practice of adding judges at K and F and instituted a Judges Supervisory Panel in hopes of improving objectivity*

It is sometimes necessary to restrain a horse in order to perform a procedure that the horse finds aversive. The application of a nose twitch is a commonly used but somewhat controversial restraint method. Research conducted several years ago suggested that a nose twitch is associated with endorphin release. This study compared the behavior, heart rates, and ease and time required to complete an aversive procedure in eight horses, average age 2.8 years, with or without a twitch.

The procedure involved clipping inside the ear, which is considered a routine competition-preparation practice in many equestrian sports. All horses had an ear clipped with and without a nose twitch in random order.

The procedure was completed faster, with fewer behavioral indicators of aversion and at a lower heart rate, when a twitch was used. When a twitch was reapplied and the procedure repeated a second time, the horses did not show evidence of increased aversion to the twitch, which would be the expected response if the twitch were acting by causing pain that diverted the horse's attention.

The authors concluded that a nose twitch, when properly applied, should be considered a feasible, humane restraint when needed for a short duration. The authors noted that twitching

is not a substitute for careful training; but in situations in which extra restraint is needed to ensure the safety of horse and handler, it is an effective method that horses tolerate well.

Horses' physiological and behavioral responses to wither-scratching and neck pats while under saddle

Zoë Thorbergson, Charles Sturt University, New South Wales; Sharon Nielsen, Charles Sturt University; Rodney Beaulieu, California State University, USA; Rebecca Doyle, University of Melbourne, Australia

A relaxed horse is better able to learn and to respond to its rider's aids. Riders frequently pat their horses on the neck as a gesture of reward or soothing, but it has been questioned whether horses appreciate being patted inasmuch as there is no comparable behavior between horses that resembles neck-patting.

Horses do, however, practice mutual grooming in a social-bonding context and as a comfort behavior. Previous research suggests that scratching the wither area imitates mutual grooming and may be more likely to relax the horse than neck-patting. This study compared behavioral responses and heart rates of 18 horses during one minute of wither-scratching, neck-patting, or no interaction after completing a short obstacle course. The course

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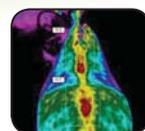


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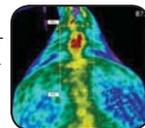
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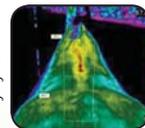
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LESS RELAXING? Horses may respond more favorably to wither scratches than to neck pats

was ridden three times followed each time by one of the treatments, with the order of treatments being randomized among horses.

Wither-scratching produced a significantly longer duration of relaxation behaviors: head lowered below the withers, ears held in a neutral position, together with significantly fewer agitated-type behaviors, such as ear-pinning and tail-swishing. Heart rate did not differ among treatments. Unexpectedly, horses displayed a similar number of agitated behaviors during both neck-patting and no interaction.

The authors concluded that scratching the horse's withers for one minute may help him to relax while under saddle and is more effective in this context than patting the neck or making no contact.

A preliminary investigation of competition performance linked to duration and frequency of nocturnal sleep behaviors

Sophie Colley, Darcy Murphy, Lucy Dumbell, and Linda Greening, Hartpury College, UK

Research on human sleep patterns demonstrates links between sleep, cognition, memory, and performance. These abilities are also important to

horse training and performance, but it is not known whether horses' sleep patterns affect their performance.

To investigate the importance of sleep as a management factor, seven horses of mixed breed, age, sex, and height were recorded from 8:00 p.m. to 6:00 a.m. for two consecutive nights. The frequency and duration of sleeping on the chest (sternal recumbence), lying flat out (lateral recumbence), and standing up were recorded. On the third consecutive day, the horses twice completed a seven-fence show-jumping course of 0.76 m. Their performance was scored according to course completion time and faults incurred.

Sternal sleep duration ranged from 0 minutes (competition score 2.76) to 67 minutes (score 7.15). There was a significant negative correlation between the duration of sleeping in sternal recumbence and competition score. Frequency of standing sleep ranged from 16 occurrences (score 7.05) to 33 occurrences (score 2.76). There was a significant negative between frequency of standing sleep and competition score.

No significant correlation was found between competition score, standing sleep duration, lateral sleep duration, sternal sleep frequency, or

lateral sleep frequency. Results indicate an association between some sleep behaviors and performance in jumpers, and it is likely that similar relationships are present in horses engaged in other sports.

These findings add to a growing body of information related to the importance of sleep in horses. The findings are particularly relevant in relation to the disturbance in a horse's sleep patterns when housed at a show facilities where there is activity throughout the night that interferes with the horse's ability to sleep.

Fitness Training for Riders

Practice of supplemental fitness training in riders

Inga Rebbeing, Hartpury College, UK; and Jenni Douglas, Hartpury College

It is often recommended that riders do some type of supplemental fitness training with the goals of enhancing performance, reducing the risk of injury, and improving their symmetry in the saddle. This study was based on a questionnaire that examined demographics, supplemental training practices, and attitudes toward supplemental training in riders.

One hundred two riders (three males and 99 females) from six countries (UK, Sweden, Norway, Canada, South Africa, and USA) completed the survey. Their average age was 29 years, and 43 percent indicated that they ride dressage.

Of the respondents, 75 percent engage in non-riding fitness training for an average of 2.8 hours per week. The type of training included a wide range of strength exercises, most commonly squats (16 percent), the use of free weights (16 percent), planks (11 percent), body-weight exercises (9 percent), pushups (8 percent), and situps (8 percent). For cardiovascular conditioning, the most frequently cited activity was running (48 percent), followed by cycling (10 percent) and walking (9 percent). However, none of the respondents followed a program designed by a sport-specific strength and conditioning coach, despite the fact that 75 percent

said they would like to participate in a rider-specific program.

The amount of fitness training practiced by riders exceeds the standard recommendations for physical activity; but because the exercise program is not specific to equestrian sports, it may not be providing maximal benefit. The authors of the study recommend that specific fitness programs be developed so that riders can maximize the benefits of supplemental athletic training.

The influence of an eight-week core-fitness program on the equine back at sitting trot

Alexandra Hampson, University of Edinburgh, UK; and Hayley Randle, Duchy College, UK

This study addressed the effect of an eight-week unmounted core-fitness

program designed for riders on rider symmetry (asymmetrical loading of the horse's back contributes to equine back pain and lameness).

Ten healthy dressage horse-and-rider pairs (average horse age 12 years, average rider age 41) performed a ridden test at sitting trot both before and after participating in the fitness program. The training consisted of a 22-minute core-fitness program done three times a week. The program included core-training exercises (crossover lunges, bird

dogs, planks, side planks, clamshells, lateral leg lifts, modified bicycles, bridge marches, reverse crunches, in and outs); stretches for the hip flexors, piriformis (supine "pretzel"), and pectoral muscles; and core stretches (cobra, child's pose, kneeling triangle).

After completing the program, all ten riders showed significant improvement in symmetry, which translated into a more symmetrical distribution of their weight on the left and right sides of the horse's back. ▲

Meet the Expert

Hilary Clayton, BVMS, PhD, Diplomate ACVSMR, MRCVS, is the professor and



Mary Anne McPhail Dressage Chair emerita. She was the first-ever Mary Anne McPhail Dressage Chair in Equine Sports Medicine at Michigan State University's College of Veterinary Medicine, East Lansing, from 1997 to 2014.

A world-renowned expert on equine biomechanics and conditioning, Dr. Clayton is president of Sport Horse Science, LC, which is dedicated to translating research data into practical advice for riders, trainers, and veterinarians through lectures, articles, and private consultations. A USDF gold, silver, and bronze medalist, she is a member of the US Equestrian Federation Dressage Committee and a USDF Connection contributing editor.



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