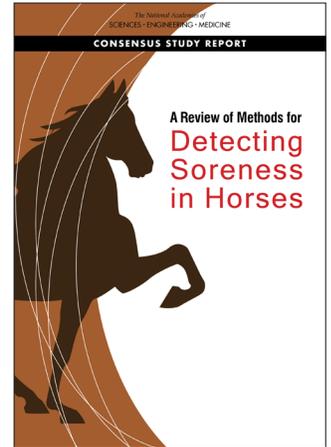




A Review of Methods for Detecting Soreness in Horses



The Tennessee walking horse (TWH) is popular in horse show competitions owing to its unique four-beat running walk and flashy movement. Show horses are fitted with tall, heavy stacks of pads to accentuate the gait they are best known for, referred to as the “big lick,” which draws people to competitions and is rewarded by horse show judges.

While some trainers of TWHs believe that the big lick can be achieved with hard work, training, and patience, there are also trainers who resort to soring, a practice that began in the early 1950s for training TWHs to exaggerate their gait in less time. Soring involves the application of chemical irritants and friction to make the horse’s forelegs sore, which causes the horse, when it makes contact with the ground, to flex its forelimbs exaggeratedly and snap them forward—producing the big lick.

Increased public awareness of soring and the resulting backlash prompted the state of Tennessee to enact anti-soring legislation in 1950, which was mostly disregarded by the industry and ultimately not enforced. In 1970 the U.S. Congress passed the Horse Protection Act which makes it illegal to exhibit, transport, sell, or auction horses that are known to be sore and authorizes the inspection of horses by U.S. Department of Agriculture (USDA) Animal and Plant

Health Inspection Service (APHIS) personnel. Given limited funding to carry out inspections, the program was expanded in 1976 to permit trained third-party individuals (referred to as designated qualified persons, or DQPs) to conduct horse inspections.

Today, APHIS relies on DQPs, horse industry organizations and veterinary medical officers (VMOs, who are APHIS veterinarians) to inspect horses before they are shown, sold, or exhibited in public. Although VMOs and DQPs use similar methods to inspect horses for soreness, disparities in inspection outcomes have raised concerns. There is also a concern within the TWH industry that the determination of soreness is inconsistent between inspectors because the methods themselves may not be reliable. Another focus of debate is the technical merits of the “scar rule” – language included in the Horse Protection Regulations that requires horses to show no evidence of soring scars during inspections.

Conducted at the joint request of APHIS, the Tennessee Department of Agriculture, and the TWH Breeders Foundation, the National Academies of Sciences, Engineering, and Medicine conducted this independent study to help ensure that HPA inspection protocols, including protocols for compliance with the scar rule, are based on sound scientific principles that can be applied with consistency and objectivity.

HORSE INSPECTIONS BY DESIGNATED QUALIFIED PERSONS AND VETERINARY MEDICAL OFFICERS

A review of available evidence suggests that differences in training and experience account for the discrepancies between VMO and DQP inspection results in past years. For example, physical examination methods are critical in detecting pain when performed by an examiner with sufficient knowledge of signs of pain. This discrepancy will continue to affect inspection outcomes if DQPs are not trained adequately and evaluated for competency by experienced equine veterinarians.

The report's authoring committee strongly recommends that use of DQPs for inspections be discontinued and that only veterinarians, preferably with equine experience, be allowed to examine horses, as is done in other equine competitions. If the limited budget for HPA enforcement necessitates continued use of third-party inspectors, they should be veterinarians or equine industry professionals who are screened for potential conflicts of interest and are trained to inspect by APHIS, not by HIOs.

METHODS USED TO DETECT SORENESS

To fulfill its charge, the committee reviewed the methods that are currently used by VMOs and DQPs and the methods typically used by equine veterinarians to determine if a horse is experiencing pain. In addition, the committee investigated other methods and technologies that could potentially aid in examining the horse's limbs for soreness.

Observation of Horse Movement and Digital Palpation

The basis of all examinations for pain and lameness is observation of horse movement and palpation of the forelimbs. However, a review of 61 DQP inspection videos indicate that inspectors do not carry out a sufficient observation of horse movement. The videos also show a large variation in the technique used to palpate the forelimbs.

Another concern is that VMOs are required to perform inspections according to APHIS protocols that are highly prescriptive. For example, VMOs are required to use the pad of the thumb with only enough pressure to blanch the thumbnail and to follow a specific pattern of applying digital pressure when palpating the horse's limbs during inspection. This prescribed palpation method falls short of established protocols for lameness examinations.

The APHIS protocols also require that two VMOs must have exactly the same findings (i.e., sensitive on

the lateral pastern but not bulbs of heels or medial pastern) and does not consider changes that may occur over time between examinations, how the horse may respond to repeated palpation, or how the presence of foreign substances either parenterally or topically may influence findings over time.

The report recommends that the extent of digital pressure applied in palpation need not be prescribed, provided that experienced equine veterinarians are performing the inspections. Owing to physiological changes that occur after repeated stimulation of a painful area, inspection protocols should be based on current knowledge of pain perception and should exclude the requirement that horses be repeatedly sore in a specific area to be disqualified.

Testing to Detect Substances that Cause or Mask Soreness

Budgetary constraints limit swabbing and testing by APHIS for prohibited substances that cause soreness or that can mask soreness. However, testing of swabs is an effective method to determine if foreign substances have been applied to the limb of horses to cause soreness or to mask soreness. The report recommends that swabs be done on a random sampling of horses or on horses that the VMO identifies as suspect from observations made on the grounds of the horse show.

Thermography

Thermography, an imaging technique that veterinarians use to detect inflammation and that was used in HPA enforcement in the past, is currently not being used in detecting soreness during horse inspections. The report concludes that thermography can provide supporting evidence of soreness and should be reinstated in the inspection of TWHs.

Blood Testing to Detect Medications

Blood sampling to test for prohibited medications and medications conditionally permitted but given above therapeutic levels (including opioids, sedatives, local anesthetics, and nonsteroidal anti-inflammatory drugs or NSAIDs) is common in equestrian competitions around the world to protect horse welfare and to ensure fairness in competition. Research indicates that such drugs may significantly reduce or abolish a sore horse's response to palpation. The report recommends that serious consideration should be given to testing blood of TWHs, using USEF's rules and guidelines as a model, to detect medications administered to alter TWH response to palpation and for overall protection of TWH welfare and ensuring fair

competitions. This would include random selection of horses, identified by microchip, at shows or sales.

VARIABILITY OF PAIN EXPRESSION

Individual horses differ in perception and expression of pain. These differences are influenced by such factors as distractions and stressors in the immediate environment and the horse's genetics, training history, temperament, and coping style. Research has shown that horses' responses to environmental stressors tend to overshadow their responses to pain.

Environmental distractions present during horse inspections can result in the inspector reaching inaccurate conclusions regarding soreness. Distractions and stressors can inhibit a horse's sensitivity to and expression of pain, such that detection of soreness would be missed, or a horse's reaction to distractions could be incorrectly attributed to pain. Moreover, when more than one inspector examines the horse, its behavior may differ between the two inspections if the number and type of distractions and stressors at that location and time also differ.

Pain or discomfort can be caused intentionally while restraining a horse during inspection. Observation of 61 inspection videos revealed numerous incidents of stewarding during the standing inspection, which may have been out of habit or to prevent or control the horse's restless behavior. Examples of stewarding included holding the reins closer than 18 inches from the bit, often just below or on the shank. In some cases, the horse was restrained with constant tension, often with the reins held in an upward direction, or with the reins pulled sharply, inflicting a noxious stimulus.

The report recommends designating a quiet inspection area that has as few distractions as possible, to get an accurate read on the horse's response to palpation during examination. To help improve accuracy of soreness detection, the inspector should ensure that custodians are following guidelines that prohibit stewarding while the horse is being inspected, and they should closely monitor horse custodians for violations.

BEHAVIORAL ASSESSMENT OF PAIN

Pain assessment in horses using facial expressions is a new area of research, and scientific investigations of these methods have not been performed in TWHs. However, evidence supports the use of facial expressions of pain as supplemental information if video is available to review or if a second inspector is pres-

ent. To improve consistency across inspectors, science-based information about behavioral indicators of pain in horses should be incorporated into inspectors' training.

Pain Assessment Using Physiological Parameters

Physiological parameters (e.g., heart rate, respiratory rate, body temperature, and blood pressure) have been used extensively to assess pain in horses and humans. They are objective and can be measured easily and repeatably; however, they have low specificity for pain, vary across individuals, and fluctuate between measurements.

The show environment and other conditions during inspections may cause physiological changes in horses that mirror those seen in pain, thus limiting utility of physiological parameters to help detect if a horse is experiencing soreness. Although often included as predictors in composite pain scales to bolster their validity and reliability, physiological parameters are not meant to be used in isolation to detect pain, but instead should be integrated with other measures in a multimodal approach.

CLINICAL ASSESSMENT OF PAIN

The decision to disqualify a horse due to soreness should be made by an experienced veterinarian, such as a VMO. The inspection should include an overall observation of the horse looking for excessive quietness or restlessness, low head carriage, weight shifting, pointing a front limb or resting a hind limb, standing hunched over or camped out and looking at a painful area, bruxism, sweating, and muscle fasciculations at rest and identification of gait asymmetry indicative of lameness during a straight line and figure 8 walk on a loose rein. Palpation of the lower limbs for the detection of pain and the presence of skin changes indicative of previous skin injury are the cornerstone of detecting a sore horse.

REVIEW OF THE SCAR RULE

The Horse Protection Regulations require a dermatological examination during inspection but limits a scar rule violation to the detection of gross lesions of the skin. The committee reviewed the scar rule to determine if the language of the rule is consistent with current findings relative to dermatopathological changes seen in walking horses examined recently as opposed to when the rule was written 46 years ago.

The scar rule language is based on the assumption that certain lesions exist microscopically and that those lesions can be detected by gross clinical der-

matologic examination and also that the terms used in the scar rule were used appropriately. In addition, it is assumed that the rule can be interpreted and applied in a consistent manner by VMOs and DQPs tasked with examination of horses for scar rule violations. None of these assumptions hold true today, and therefore the rule as written is not enforceable.

The report recommends that the language of the rule be revised. The revised language is as follows:

A trained inspector should examine skin of the front limb of the horse from the knee (carpus) to the hoof with particular attention to skin of pastern and fetlock and the coronary band. All areas of skin from carpus to hoof of both limbs should be free of foreign substances such as dyes, hair fillers, ointments, and other substances designed to camouflage scar rule violations during pre- and post-show inspections. Detection of previously approved substances such as lubricants during post-competition inspection does not constitute a violation. There should be no chemical smell emanating from the skin and no substance present that can be rubbed off onto the hands or a cloth. Skin should be haired with no areas of loss of hair, patchy or diffuse. There can be no swelling, redness, excoriation, erosions, ulcers, seeping of fluids, or signs of a response to chronic injury such as epidermal thickening or presence of scales. Photo documentation of lesions, identifying information about the horse, and a date should be provided for any horse determined to be or suspected of being in violation of the scar rule.

Normal appearance of the skin of the palmar aspect of a horse.

SOURCE: Photograph by J. Kevin Hahn, D.V.M. Used with permission.



Pastern of a chronically sores horse in violation of the scar rule. There is marked lichenification and alopecia (hair loss). Note the exaggerated, thick, deep skin folds. This type of fold does not flatten with digital pressure.

SOURCE: Photo courtesy of the Humane Society of the United States.

COMMITTEE ON A REVIEW OF METHODS FOR DETECTING SORENESS IN HORSES

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For More Information . . . This Consensus Study Report Highlights was prepared by the National Academies of Sciences, Engineering, and Medicine based on the Consensus Study Report *A Review of Methods for Detecting Soreness in Horses* (2021). The study was sponsored by the Tennessee Department of Agriculture, Tennessee Walking Horse Breeders Foundation, and the U.S. Department of Agriculture - Animal and Plant Health Inspection Service. Any opinions, findings, conclusions, or recommendations expressed in this publication do not necessarily reflect the views of any organization or agency that provided support for the project. Copies of the Consensus Study Report are available from the National Academies Press, (800) 624-6242; <http://www.nap.edu> or via the Board on Agriculture and Natural Resources web page at <http://www.nationalacademies.org/banr>.

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