Scientific data has yielded interesting results on how equipment/tack affects a horse's ability to breathe properly

Respiratory Equipment's Impact on Airways

USE OF **TONGUE TIES** AND **NOSEBANDS** ARE STUDIED

By **AMANDA DUCKWORTH**

RACEHORSES RELY ON good respiratory health to be able to perform at the peak of their abilities. It is why endoscope results can influence owners, trainers, and buyers alike. Some respiratory health is dependent on how a horse is structurally put together. However, there are some factors that can be controlled by humans.

In recent years, researchers have been examining how the choice of tack and other aids can affect a horse's respiratory health. From bits to nosebands to tongue ties, there are a number of options available to trainers. How effective those choices are and how they are perceived can vary. Understanding the science behind their efficacy is growing in importance for a number of reasons.

Globally, the use of various equipment and their physical impact on horses have become a focus of the general public. In February 2026, the Journal of Equine Veterinary Science published "Riding with Care: A review of factors that influence the welfare of the ridden horse and a case for the application of the precautionary principle in equestrian pursuits."

"Equestrian sport's social license to operate has come under scrutiny due to concerns surrounding the well-being of ridden horses," explained researchers. "Inappropriate equipment use, such as harsh bits or overtight nosebands, can negatively influence well-being by generating inescapable pressure or pain on the sensitive structures of the horse's head and limiting natural behaviors. Restrictive equipment may also be used to generate exaggerated, stressful and uncomfortable head and neck positions such as hyperflexion.

"The ridden horse's well-being is a multifactorial and complex equation. However, riders must seek to understand these nuanced aspects of well-being, and act on the precautionary principle (stating that a practice should not be assumed harmless until it is proven to be so) if there is not yet enough evidence on a subject to draw firm conclusions. Such directives will safeguard the welfare of ridden horses and the social license to operate for equestrian sports."

For racehorses, tongue ties are a fairly common piece of equipment. These strips of material are passed through a horse's mouth over the tongue and tied under the jaw. They are meant to keep a horse from putting its tongue over the bit and are sometimes used to prevent dorsal displacement of the soft palate (DDSP). In July 2023, the Equine Veterinary Journal published "Tongue ties do not widen the upper airways in racehorses."

"There is contradictory evidence on the potential benefits of tongue ties on upper airway function and their efficacy in inhibiting intermittent dorsal

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displacement of the soft palate (DDSP) in racehorses," researchers explained. "Tongue ties are expected to decrease the occurrence of DDSP, as they inhibit retraction of the larynx connected to the tongue via the thyrohyoid bone. They may also increase the pharyngeal diameter, as the fixated tongue base cannot press against the soft palate from the oral cavity. An increase in pharyngeal diameter would reduce the negative inspiratory pressure and; therefore, possibly also prevent other forms of dynamic airway obstruction such as laryngeal or pharyngeal collapse."

The objective of the prospective, crossover blinded clinical study was to test the hypothesis that tongue ties increase the pharyngeal diameter and decrease the occurrence of dynamic airway obstruction in racehorses.

For the study 38 horses were used, including 30 Thoroughbreds and eight Standardbreds. Eventually eight horses left the study. All of the horses involved in the study were in race training and had raced previously, but also all had a history of poor exercise tolerance. Data collected from the trainers revealed that 20 horses were familiar with tongue ties, while 18 had never previously worn tongue ties.

The effectiveness of tongue-tie use was the subject of a study using both Thoroughbreds and Standardbreds. Researchers concluded, "results do not support the use of tongue ties to improve upper airway function."

"The PE ratio increased significantly from 1.11 ± 0.19 to 1.28 ± 0.30 in all horses between rest and full-intensity exercise," researchers found. "Multivariable analysis revealed that this effect decreased significantly by the application of tongue ties. Tongue ties did not influence maximum laryngeal width and area significantly. DDSP was found in 4 of 30 examinations with tongue tie and in 1 of 30 examinations without tongue tie.

"In conclusion, our results do not support the use of tongue ties to improve upper airway function. Pharyngeal diameters during strenuous exercise were reduced by tongue tie application. These results might provide objective evidence for future decisions of equine sports organizations concerning the regulations on tongue ties."

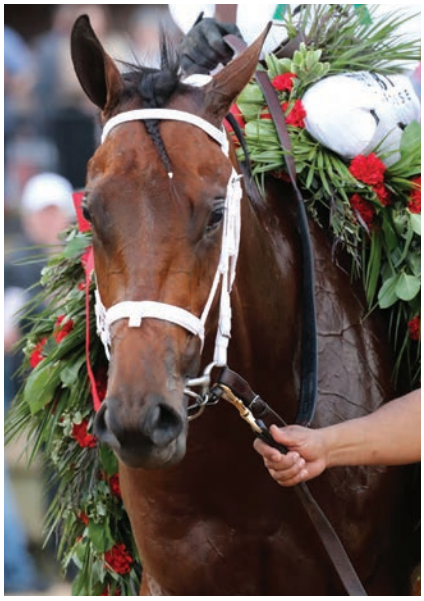
When it comes to nosebands, which have long been a part of bridles, they are often used to impact how much control a rider has over a horse. While it is true that the tighter the noseband, the more control, there is a tipping point where it can negatively affect the physical well-being of the horse. In July 2024, Veterinary Medicine and Science published "Do tight nosebands have an effect on the upper airways of horses?"

"The public perception relating to the welfare of horses involved with equestrian sports is associated with training methods used and the presentation of horses at events," explained researchers. "In this context, very tight nosebands, which are intended to prevent the horse from opening its mouth, also attract a lot of attention.

"Various studies have evaluated the impact of tight nosebands on stress parameters, whereas the effect of tight nosebands on upper airway function is unknown. Therefore, the aim of the study was to use overground endoscopy to evaluate changes in pharyngeal and laryngeal function when a tight noseband is fitted."

During the randomized, blinded, and prospective study, 16 Warmblood horses were ridden on two consecutive days with either loose or tight nosebands. Loose nosebands allowed two fingers between bridge of the nose and noseband, while tight ones allowed no space. Videos were taken in a riding arena during a standardized exercise protocol. Additionally, the ridden horse pain ethogram (RHpE) was applied to investigate signs of discomfort.

"While the pharynx-epiglottis ratio did not change significantly in horses ridden with loose versus tight nosebands, there was an increase in mean grade and total counts of parameters assessed in the pharyngeal region, for example, grade of secretion, axial deviation of the aryepiglottic folds, and pharyngeal collapse in horses ridden with tight nosebands," researchers concluded. "There was no RHpE score above 8 indicating musculoskeletal pain, but the RHpE scores were significantly higher in horses ridden with tight nosebands.



As part of a clinical study, the snugness of nosebands was tested to see if a tighter application negatively impacted respiratory function

"BITS HAVE OFTEN BEEN INCRIMINATED AS A CAUSE OF UPPER RESPIRATORY TRACT OBSTRUCTION IN HORSES. HOWEVER, NO SCIENTIFIC STUDIES ARE AVAILABLE TO CONFIRM OR REFUTE THESE ALLEGATIONS. CLINICAL SIGNS OF DYNAMIC LARYNGEAL COLLAPSE (DLC) ASSOCIATED WITH POLL FLEXION ARE INDUCED WHEN SUSCEPTIBLE HORSES ARE RIDDEN OR DRIVEN INTO THE BIT."

— EQUINE VETERINARY JOURNAL, JANUARY 2021

"Results add to the evidence obtained in other studies that tight nosebands do not only cause adverse reactions based on the RHpE score such as head behind the vertical or intense staring but also contribute to changes in the pharyngeal region, such as increased secretion and collapse of pharyngeal structures. This may provide further support for future decisions regarding regulations on nosebands."

Nosebands have become a topic of debate in multiple equestrian disciplines. In April 2020 Animals (Basel) published "The Reported Use of Nosebands in Racing and Equestrian Pursuits."

"Nosebands are commonly used in many equestrian and racing disciplines," researchers explained. "Despite common industry knowledge regarding the correct adjustment of nosebands, there seems to be a trend of overtightening nosebands and exposing horses to high pressures that restrict normal behaviors. Thus, there are concerns that nosebands could have harmful physical and behavioral impacts on horses."

An online survey of horse owners, riders, and trainers explored the distribution of common noseband designs across various disciplines, the reasons for their use, their perceived effectiveness, design preferences, and how tightness is monitored, as well as detrimental consequences of their use.

Researchers found that the reasons

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for using nosebands varied widely among respondents according to noseband type and discipline. The most common reasons for use included preventing a horse's tongue from moving over the bit, improving its appearance, and aligning with the rules of the sport. From the survey, almost a fifth of respondents reported physical and behavioral complications related to noseband use.

"Respondents who trained racehorses and show-jumpers were more likely to give an anatomical reason for noseband use than the average, whereas respondents involved with natural horsemanship and pleasure/fun were less likely to give an anatomical reason," researchers concluded. "Additionally, respondents who trained racehorses were more likely to give a consequential reason for noseband use than the average, whereas dressage riders and those involved with pleasure/fun were less likely to give a consequential reason."

A 2024 Breeders' Cup participant training in a bitless bridle at Del Mar. A 2021 study concluded that bitless versus snaffle bridles did not provide clear evidence that the latter "influences the development or severity of (dynamic laryngeal collapse)."

A year later, in February 2021, Animals (Basel) published a study that looked specifically at racehorses in "The Reported Use of Tongue-Ties and Nosebands in Thoroughbred and Standardbred Horse Racing—A Pilot Study."

"Tongue-ties (TTs) are commonly used in racing to restrain a horse's tongue to aid a rider's/driver's control of the horse and optimize upper airway function," explained researchers. "Nosebands (NBs) may also be employed for similar purposes. This article reports on a survey that asked people involved in Thoroughbred (TB) and Standardbred (SB) racing whether they used TTs and NBs and, if they did, the reasons for their use, the preferred design of device, the devices' perceived effectiveness at achieving the respondents' desired outcome(s), any complications due to their use and whether or not these complications altered their decision to use a particular type of TT or NB."

It's more likely that rein tension, rather than the use of traditional bits, leads to DLC in susceptible horses

A total of 112 participants involved in racing took part. Data showed that tongue-tie use was reported by 62.5% of racehorse trainers.

"The reasons for TT use varied between TBTs and SBTs," researchers found. "For TBTs, the most common reason for TT use was to prevent or reduce airway obstruction (72.3%), followed closely by to prevent or reduce airway noise (55.3%). Standardbred trainers assigned equal importance for TT use to prevent or reduce airway obstruction (69.6%) and to prevent the horse from moving its tongue over the bit (69.6%)."

Of those who do use tongue-ties, 51.4% reported either a physical or behavioral complication due to its use. Redness and/or bruising of the tongue was the most common physical complication reported.

"This pilot study has revealed that respondents are likely to use tongue ties for reasons related chiefly to improving upper airway issues and preventing the horse's tongue from moving over the bit," concluded researchers. "It has revealed that just over half of respondents had encountered either a physical or behavioral complication due to TT use and that complications are associated with the duration of TT use and the way in which it is putatively checked for tightness. Although these preliminary findings cannot be applied to the greater racing community due to the dangers of generalization, this study should inform future researchers in assessing the risks of TTs."

TOP: SKIP DICKSTEIN; BOTTOM: COADY MEDIA/ASHLEY PHILLIPS

Even the most basic of tack—the bit—has been researched in terms of impact on a horse's respiratory ability. In January 2021, Equine Veterinary Journal published "A bitless bridle does not limit or prevent dynamic laryngeal collapse."

"Bits have often been incriminated as a cause of upper respiratory tract obstruction in horses," explained researchers. "However, no scientific studies are available to confirm or refute these allegations. Clinical signs of dynamic laryngeal collapse (DLC) associated with poll flexion are induced when susceptible horses are ridden or driven into the bit."

For the study, researchers examined whether a bitless bridle in place of a conventional snaffle bit would reduce the severity of DLC in affected horses measured objectively using inspiratory tracheal pressures.

Nine horses previously diagnosed with DLC were exercised on two consecutive days using a standardized high-speed treadmill protocol. Measured data included head and neck position, rein tension, inspiratory tracheal pressure measurements, and laryngeal videoendoscopy recordings. Seven of the horses' data qualified for inclusion in the study.

"The change in mean inspiratory tracheal pressure between free and flexion phases in the bitless bridle was significantly greater than in the snaffle bit bridle," researchers concluded. "Mean inspiratory pressure during the free phase was significantly more negative with the snaffle bit bridle, vs the bitless bridle. Mean pressures in flexion phase, snaffle bridle, vs bitless bridle were not significantly different between bridles.

"This study could not provide any clear evidence that the effect of a snaffle bit in a horse's mouth influences the development or severity of DLC. Instead, head and neck angles induced by rein tension seem to be the key event in provoking DLC in susceptible horses."

Good respiratory health is important for racehorses, and it is a multifaceted issue. No horse is the same, but keeping abreast of the latest scientific data can help caregivers make the appropriate choices for the individuals in their care. BH