

Equine personality traits are of major importance to training success as well as equine welfare, but at present, suitable assessment methods for use in genetic selection are scarce. The aim of the study was to select the most suitable traits out of a variety of behavior traits assessed experimentally during breed shows for incorporation into breeding horse evaluations. For this purpose, mature ($n=48$) American Quarter Horses and foals ($n=198$) were observed during various procedures during their participation in breed shows. A variety of behavior traits considered to be relevant for ease of training or safety were recorded and evaluated using a linear scale ranging from -2 (e.g. complete absence of the behavior pattern) to 2 (frequent occurrence of the behavior pattern) by an experimenter. Most traits deviated from a normal distribution (Kolmogorov-Smirnov: $P<0.01$), indicating that prior selection for these traits either at the genetic or phenotypic level have already taken place (Kolmogorov-Smirnov: all $P<0.0001$). Foals that were perceived as more 'bright' by the observers, carried their tail higher ($r_{246}=0.2$, $P<0.01$), kept a larger distance from their dam ($r_{161}=0.4$, $P<0.0001$) and showed more exploration of the environment ($r_{184}=0.2$, $P<0.001$). Temperament correlated strongly with calmness ($r_{246}=0.7$, $P<0.0001$) and the overall impression during free-running (high-spirited, $r_{246}=0.8$, $P<0.0001$). In view of these results, reducing the number of traits to a few of the most relevant and objectively assessable traits appears to be justified. Ultimately, identification of, and genetic selection for, suitable behavior traits might ease training and improve both equine welfare and human safety.

Keywords: personality; character; temperament; human-horse interaction; breed show

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The Australian equine industry

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Since the introduction of horses in 1788, the equine industry has developed to be one of the top ten industries in Australia with an estimated contribution of over 6.3 billion dollars to Australia's Gross Domestic Product. The Australian equine industry comprises of a range of disciplines including racing, dressage, eventing, showjumping, pony club, cutting, reining, stock work, polo, polo cross, drafting and pleasure riding. There are few countries where the Thoroughbred has played such a significant part in the development of a national identity and culture as the race horse in Australia. Due to the high wastage rates in the horse racing industry, community concerns are increasing over animal welfare. These wastage rates reflect on the industry as a whole and in recent years the development of re-homing, re-training and rehabilitation centres has provided an avenue for retired race or performance horses into a new career. These enterprises may assist in a decrease in overall wastage and have been adopted well beyond the Thoroughbred racehorse. The development of Equine Welfare Strategies throughout disciplines is designed to shape a culture in which the welfare and safety of horses is paramount. These strategies are developed through industry collaboration, extensive consultation with industry stakeholders and experts and are established to set strong objectives and priorities for the future. The introduction of these strategies may increase understanding of animal welfare requirements and have a positive change in an industry where horses are so ingrained in the nation's culture and history.

Keywords: equine industry; welfare; wastage; economy; culture

THEME: CHANGE

SUBTHEME: MEASURING EQUINE BEHAVIOR

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Through their eyes: the challenge of assessing equine emotional state

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Animal welfare assessment has traditionally relied on measures of physical health and changes in behavior and physiology related to negative emotional states such as pain and stress. However, it is now widely accepted that good welfare is not simply the absence of disease or negative experiences, but also the presence of positive experiences such as pleasure. The development of an 'Equine Quality of Life' (EQoL) framework is essential for providing horse owners, riders and practitioners with an evidence-based instrument for assessing the overall life experience of horses. It is therefore necessary to be able to appraise both the physical and mental well-being of a horse in relation to situations and events that it experiences during its working lifetime. To date the emotional significance of the animal's response has been overlooked. A seemingly objective physiological measures, heart rate, has been found to reflect arousal level rather than emotional valence, and furthermore behavioral signs do not always reflect physiological responses. However, assessment of motivation to approach or avoid as an indicator of positive/negative response, as well as fear- and aggression responses may be better behavioral indicators of emotional state. Methods used in non-equid species such as cognitive bias testing have yet to be used successfully in horses. The characterization of equine emotional response in terms of arousal level and valence, using validated equine-based indicators can lead to the development of an Equine Quality of Life (EQoL) framework against which the impact of different situations and experiences on horses during their lives.

Keywords: emotion; mental state; cognition; behavior; Equine Quality of Life

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The effect of different bits, bridles and rein handling on rein tension and muscle trigger point reaction

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Muscular condition and equipment are considered to influence equine performance, however, their interactions with rein tension have not been investigated. The study aim was to investigate the effect of different bits, bridles and the horse's muscle trigger point reactions on the magnitude and symmetry of rein tension in Western (W, 61 rides) and English (E, 46 rides) riding styles. Mean rein tension was measured in 65 riders and 88 horses in walk, trot and canter in both directions with either snaffle bits or curb bits. Twenty eight muscle trigger points (irritable spots in the fascia surrounding skeletal muscles) were assessed bilaterally and categorized according to the reaction to manual pressure (reaction level 0-3). Mixed-model analysis

was used for normally distributed mean tension and generalized mixed model analysis for standard deviation (SD) and range of rein tension. Mean rein tension was lowest for French cavessons combined with curb bits ($2.3 \pm 2.3\text{N}$) and Figure-eight nosebands combined with snaffle bits ($4.5 \pm 2\text{N}$) compared to other combinations of snaffle bits with different cavessons (No cavesson: $6.7 \pm 0.9\text{N}$, French cavesson: $9.2 \pm 1.1\text{N}$, drop noseband: $10.2 \pm 3.2\text{N}$, flash noseband: $14.7 \pm 1.4\text{N}$, $F_{8,83}=6.2$, $P<0.0001$). Horses with stable rein contact as self-assessed by riders showed the most symmetric trigger point reactions (left-right difference 0.03 ± 0.03 , $F_{3,93}=3.8$, $P<0.05$). Left-right difference was asymmetric in horses ridden with “very instable” rein contact (0.3 ± 0.2 , $F_{3,93}=3.6$, $P<0.05$). Bridles prohibiting jaw opening were associated with higher rein tension indicating possible welfare issues. Considering relationships between horse’s muscular condition and rein tension appears important for equine welfare and might increase the knowledge of horse-rider-interactions.

Keywords: rein tension; muscle trigger point; symmetry; bits; bridles; welfare

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Horses’ voluntary acceptance of rein tension with various bitless bridles compared to a single-jointed snaffle bit

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A study was conducted to investigate how horses perceive the pressure exerted by various bitless bridles as compared to a regular snaffle bit. For this purpose, 21 leisure or riding school horses all usually ridden with a jointed snaffle bit were each equipped in random order with the following headgear: LG-bridle®, Sidepull, Dr. Cook’s BitlessBridle®, Fred Rai Rope®, conventional rope halter, and a conventional bridle with a single-jointed snaffle bit. Reins were equipped with a rein tension meter fastened 10 cm above the withers to an anti-roll bar of a girth and adjusted to a length that allowed the horse to hold the forehead 5–10 degrees in front of the vertical. Subsequently, horses were lured with food to encourage them to stretch against the reins, while standing in a stable. This procedure was repeated a total of 9 times per horse and bridle type. A mixed model was used to analyse maximum rein. With the exception of the Sidepull ($26.7 \pm 2.9\text{N}$; $F_{5,334}=7.67$; $P<0.05$), horses applied similar ($P>0.1$) amounts of maximum tension to all other bridles ($32.4 \pm 2.9\text{N}$ – $38.9 \pm 2.9\text{N}$), including the snaffle bit, although the Sidepull and the snaffle did not differ significantly from each other ($P>0.05$). Provided that horses receive equal levels of prior cue training, results indicate that with the investigated headgear except for the Sidepull, similar levels of rein tension may be required to produce a salient stimulus, and that the same amount of rein tension results in similar levels of discomfort in the horse.

Keywords: rein tension; bitless bridle; snaffle; welfare

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An opportunistic pilot study of radiographs of equine nasal bones at the usual site of nosebands

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Restrictive nosebands are of growing concern because of their putative impact on equine welfare. The aim of the current preliminary, opportunistic study was to evaluate archived radiographs of equine nasal bones for evidence of trauma such as bone deposition, bone lysis, changes in bone homogeneity, bone fractures or soft tissue swelling and to test whether age, sex or breed were risk factors. Radiographs of equine skulls ($n=60$) were studied by a specialist radiologist blinded to their signalment, for any evidence of the described bony or soft tissue changes. Horses with such changes were classified as cases. Cases ($n=6$) were matched to the signalment of each horse (age, sex, breed) by the author and associations with being a case were assessed using chi-square tests and logistic regression analysis. Among the 60 horses assessed, 3 out of 6 warmbloods, 2 out of 18 thoroughbreds and 1 out of 5 stockhorses were cases. The association with being a warmblood was statistically significant ($P<0.01$) with a 39.3 times greater risk of changes than other breeds. Cases were not significantly associated with sex or age. Cases were also discussed with a second specialist and there was some lack of consensus as to whether some changes represented normal anatomical variation and/ or radiographic artefact. Any further radiographic studies in this domain should consider using a prospective sample, establish consistent radiography protocols and aim to establish normality by studying a control population that have not had human interventions.

Keywords: tight; noseband; radiograph; bone; changes; trauma

THEME: CHANGE

SUBTHEME: HUMAN BEHAVIOR CHANGE

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Introducing human behavior change for animals: a new approach to sustainable change for horses

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The root cause of most welfare issues for horses is human behavior – people doing, or not doing, certain care, management or training practices. In addition, there is a gap between advancing scientific knowledge about equine welfare and the practical application of these findings by the people who own, train and care for horses. To make a sustainable difference to equine welfare, therefore, established evidence-based models and interventions to drive human behavior change should be applied. For example, the Behavior Change Wheel and COM-B (capability, opportunity, motivation – behavior) model are evidence-based tools created by University College London that can help the user understand, select and specify the target behavior, including what needs to change; the tools themselves help to identify and develop intervention functions and strategies, together with implementation options and behavior change techniques. The application of the evidence-based Behavior Change Wheel and learning from other fields, such as psychology, anthropology, behavioral economics, and many more in the equestrian sector could help to address the gap between the knowledge available from academia and the people who own and care for horses and help to deliver positive change. Some examples of models were reviewed through case studies where they have started to be applied to promote Equitation Science. Collaboration, communication and change will be key to sustainable change for horses.

Keywords: behavior change; human; animal; horse; welfare; collaboration