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±2.3N) and Figure-eight nosebands combined with snaffle bits (4.5±2N) compared to other combinations of snaffle bits with different cavessons (No cavesson: 6.7±0.9N, French cavesson: 9.2±1.1N, drop noseband: 10.2±3.2N, flash noseband: 14.7±1.4N, $F_{8,83}=6.2$, $P<0.0001$). 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±2.9N; $F_{5,334}=7.67$; $P<0.05$), horses applied similar ($P>0.1$) amounts of maximum tension to all other bridles (32.4±2.9N – 38.9±2.9N), 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