15th Alltech-Hartpury Student Conference

Conference Proceedings

13th May 2026

HARTPURY UNIVERSITY

Keynote Speakers

Dr Jenny Burbage, *University of Portsmouth*

Dr Jenny Burbage is an Associate Professor in Applied Biomechanics and Women's Health at the University of Portsmouth, specialising in the science of breast movement, support, and comfort in physically active women. Her research explores how breast biomechanics, bra fit, and functional support influence performance, safety and wellbeing across both sport and demanding occupational environments.

Jenny has been investigating breast support needs since 2007 and completed her PhD in 2013 on the biomechanics of breast support in female recreational athletes. She has since published widely and collaborated with sporting, military and emergency service organisations to translate research into real-world impact. Her work with the British Army contributed to the introduction of a sports-bra fitting and issue service for female recruits, and her current programme with the Metropolitan Police is helping understand how bras interact with body armour for female officers.

Alongside her occupational research, Jenny has a long-standing interest in equestrian sport and has collaborated on studies relating to breast health and bra selection in horse riders. Her work highlights the unique demands that riding places on the breast and the importance of appropriate support for comfort, confidence, and performance in the saddle. Jenny is passionate about improving access to breast health education, raising awareness of the importance of well-fitted, functional bras, and ensuring that female equestrian athletes have the support they need to perform at their best.

Keynote Speakers

Dr Richard Newton, *Equine Infectious Disease Surveillance (EIDS)*

After several years as a veterinary surgeon working in general mixed practice, in 1994 Richard joined the Animal Health Trust (AHT). At the AHT, as well as gaining an MSc, PhD and FRCVS, he acquired a breadth of experience in the epidemiology, surveillance and control of a range of equine infectious diseases, including influenza, strangles and equine herpesvirus.

Richard was the Director of Epidemiology and Disease Surveillance and Acting Director of Research at the time the AHT permanently closed in July 2020. His team were immediately retained by the UK Thoroughbred racing and breeding industry through the British Horseracing Authority (BHA). Having established Equine Infectious Disease Surveillance (EIDS) as a new initiative at the BHA, the EIDS team transferred to Cambridge Vet School in November 2021 and continues to provide global disease surveillance and advice on disease prevention strategies and outbreak management.

Richard has been principal investigator or co-applicant on many project grants, linked to non-infectious as well as infectious equine health and welfare topics. He remains a member of several equine industry advisory committees, including the veterinary committees of both the British Horseracing Authority (BHA) and the Thoroughbred Breeders' Association (TBA), the Codes of Practice sub-committee of the Horserace Betting Levy Board (HBLB), the UK Equine Disease Coalition, and the International Equestrian Federation (FEI) Veterinary Epidemiology Working Group.

Keynote Speakers

Dee So'oialo, *The Performance Hub*

A recognised leader in horse and rider performance, Dee is the Founder of The Performance Hub - the world's first facility dedicated to the integrated development of elite equestrian partnerships, and a catalyst for a new era in equestrian performance. Working at the highest level of equestrian sport, Dee and the team work with many of the world's leading horses and riders across the three Olympic disciplines. This frontline experience directly informs a progressive, science-led approach that redefines how performance is understood and developed, placing equal emphasis on the physical, technical and physiological demands of both horse and rider.

As the creator of EQ Bands - the original resistance training system designed specifically for riders, both on and off the horse - Dee has pioneered innovative methods that enhance rider stability, symmetry, and effectiveness in the saddle. This work has been instrumental in shifting industry perception, firmly establishing riders as athletes in their own right.

At the core of Dee's work is a commitment to excellence and exploration through collaboration - bringing together a world-class, ever-evolving network of specialists to connect the dots and optimise performance for both elite and ambitious amateur partnerships. Known for combining precision, insight, and a deep respect for the horse, Dee and the team are at the forefront of a new era in equestrian sport - championing a more intelligent, sustainable, and welfare-driven model for success. Through The Performance Hub, this vision is not only being developed but experienced in practice - offering a unique insight into the future of horse and rider performance.

Influence of Protective Boot Material on Post-Exercise Limb Temperature Recovery in Horses; A Pilot Thermographic Investigation

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Keywords: Thermography; tendon temperature; protective equipment; exercise recovery

Introduction: Protective boots are widely used in equine disciplines to reduce the risk of traumatic injury to the distal limb. However, growing evidence suggests that certain boot materials may contribute to increased tendon temperature during exercise, potentially increasing the risk of cumulative tendon damage (Hopegood *et al.,* 2013). While previous research has primarily focused on temperature increases during exercise (Smith & Goodship, 2008), less attention has been given to the recovery phase following work. Therefore, the aim of this pilot study was to investigate post-exercise temperature recovery patterns in equine limbs when different types of protective boots were worn.

Materials & Methods: Limb surface temperatures of the superficial digital flexor tendon (SDFT) region of both forelimbs were measured with a thermal camera in four horses before exercise, immediately after exercise and at 5,10, 20 and 30 minutes post-exercise after wearing neoprene boots and ventilated boots. The forelimbs were selected due to their greater weight-bearing role and susceptibility to mechanical loading and head accumulation during exercise. Thermographic images were captured under standardised conditions using fixed distance (2 metres), perpendicular angle, and a consistent region of interest (ROI) over the mid-metacarpal region, with horses positioned square and stationary to ensure repeatability. All exercise sessions were conducted in an indoor arena to minimise environmental variation such as wind and solar radiation, although ambient temperature and humidity were not formally recorded. Wilcoxon signed-rank tests were used to assess bilateral limb differences to establish a mean temperature in each measuring phase. A Friedman test was applied to examine temperature differences across experimental phases.

Results: Limb temperature increased following exercise and progressively declined during the recovery period in both the treatment conditions. Statistically significant temperature changes between immediately after exercise and recovery phases for both neoprene (χ^2 (5) = 16.007, p = .007) and ventilated boots (χ^2 (5) = 17.286, p = .004). Ventilated boots showed a larger percentage increase in temperature immediately after exercise, with limb temperature rising by 45.54% compared to a 37.41% increase observed in the neoprene conditions. Neoprene boots demonstrated a more rapid reduction in temperature during early recovery, with a 19.79% decrease within the first 5 minutes post-exercise, compared to a smaller 13.33% decrease observed in the ventilated boot conditions. A comparison between baseline, neoprene and ventilated conditions also indicated a significant difference in temperature (χ^2(2) = 6.5, p = .039).

Discussion & Conclusion: These findings indicate that exercise significantly elevates limb temperature regardless of boot type, but differences in the magnitude of heat accumulation and the rate of post-exercise cooling suggest that boot material may influence short-term thermoregulatory responses in equine limbs. As a pilot investigation, these findings provide a preliminary insight into how boot material may influence limb temperature recovery following

exercise. Further research involving larger sample sizes is required to better understand the potential implications of protective boot use for equine tendon health and injury risk.

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Does the Age of UK & Irish Broodmares at Foaling Significantly Influence Their Progeny's Official Rating on The Racing Post?

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Keywords: Thoroughbred; Breeding; Performance; Foal.

Introduction: Links between Thoroughbred pregnancy outcomes including foal birth weight and broodmare age have been suggested in research literature (Wilsher and Allen, 2003). Degenerative physiological changes in the reproductive tract, including decreased ovulation rates, embryo quality and alterations in endometrial health, have been associated with advancing mare age (Scoggin, 2015). While the influence of maternal age on reproductive outcomes are well documented, its impact on progeny racing performance remains unclear. Therefore, this study investigates the relationship between mare age at foaling (MAF) and official rating (OR) of progeny. Furthermore, research identifies an association between additional foalings and increased foal birth weight (Elliot, 2009) suggesting that foal birth order (FBO) may contribute to multifactorial performance model. Thus, the relationship between FBO and OR was also observed.

Materials & Methods: Data were retrospectively sourced from the Racing Post records for UK and Irish mares (n= 100) and their progeny (n= 704) during the 2022-2025 flat racing season at Newmarket Racecourses (Rowley Mile, July Course). Strict inclusion criteria were implemented for mares including mare origin (UK or Irish), number of eligible progeny (≥ 6), racing career and age. Progeny inclusion criteria included age, sex, stallion stud fee, OR and racing career (flat racing career). Stallion stud fees (£10,000-£60,000 & €12,000-€67,000) were included as a control variable for potential stallion influence on progeny performance. The association between MAF, FBO and progeny performance outcomes using OR was determined by Spearman's correlation coefficient.

Results: MAF ranged from 4 years to 23 years (mean 11.1 ± 4.2). Mean progeny OR values ranged from 71.25 to 87.75 (mean 82 ± 17.3). A significant but weak negative correlation between MAF and progeny OR was observed ($p = 0.001$, $r = -0.124$). Descriptive statistics identify a non-linear trend; progeny OR declined after the mare reached approximately 8 years, but values fluctuated among mares aged >19 years. FBO ranged from 1 to 14 (mean 5 ± 2.8); the mean ORs ranged from 77.24 to 90.00. A similar significant but weak negative correlation between FBO and progeny OR was identified ($p = 0.002$; $r = -0.115$). These results indicate that both MAF and FBO contribute modestly to variation in progeny performance.

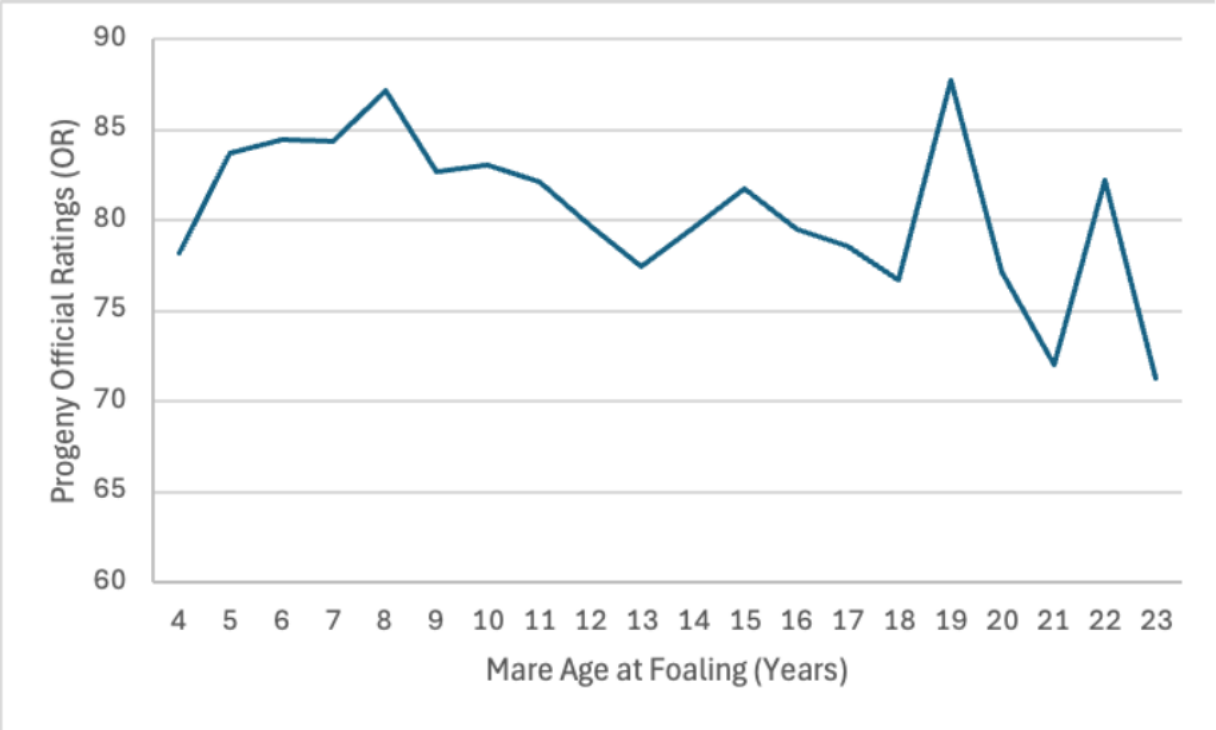

Figure 1: Relationship Between Mare Age at Foaling and Progeny Official Ratings

Discussion & Conclusion: Both MAF (r=-0.1224; p=0.001) and FBO (r=0.115; p=0.002) demonstrated a statistically significant but weak correlation with the OR of progeny. Indicating that each only contributes marginally to variation in progeny performance. While the impact of MAF and FBO cannot be ignored, both contribute to a multifactorial and complex performance model in Thoroughbred progeny success. Environmental factors such as postnatal growth trajectories, training approaches and intensity, injury history and racing opportunities warrant concurrent considerations for predictive modelling in future research.

Incorporating maternal age reproductive metrics into the existing performance prediction models refine the assessment of potential performance success, providing stakeholders within the breeding industry with additional measurable variables when evaluating progeny. Consequently, considering maternal age variables will support breeding and investment decisions within the Thoroughbred racing and breeding industry.

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The Case for Collaboration: Insights from the Racehorse Training Sector on the Research-Practice Relationship

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Keywords: Equine welfare; Research-Practice gap; Social License to Operate (SLO); welfare assessment.

Introduction: Despite advances in equine welfare science, there remains limited understanding of research application and utilization within racehorse training environments, Research identifies tensions between welfare priorities, performance demands and external pressures, alongside heightened public scrutiny linked to the industry's social license to operate (SLO) (Butler *et al*., 2019; Heleski *et al*., 2023). Trainers are often positioned as recipients of research rather than contributors, with knowledge built through experiential learning (Ely *et al*., 2010). Consequently, the persistence of a research-practice gap suggests a limited understanding of how factors such as trust and access to resources shape engagement with scientific research, and the extent of alignment between research and practice. The aim of this study was to explore how racehorse trainers perceive and engage with scientific research, to identify barriers and enablers to its practical implementation and to examine how experiential knowledge can contribute to more collaborative and welfare-focused approaches within the racing industry.

Materials & Methods: Participants were required to be involved in the training of racehorses and to contribute directly to welfare-related decision-making. A current and valid racehorse trainer's license in accordance with the BHA regulations, or registration as a Point-to-Point 'Keeper' under Point-to-Point Authority (PPA) regulations, was necessary. Semi-structured interviews were used to gather insights on the relationship, among four BHA licensed trainers, and one 'keeper' operating within amateur horseracing. Data were analysed using a reflexive thematic analysis, adopting a semantic approach to identify key themes.

Results: Four themes were identified: (1) Pragmatic Integration of Scientific Research, (2) Structural Barriers to Access, (3) Resistance to the Standardisation of Welfare, and (4) Defending Professional Autonomy. Findings revealed that trainers adopt an experience-led approach, utilising scientific research as a supportive aid in their practice. Engagement with research was constrained by structural pressures, including workforce challenges, competition demands and cost of implementation. Trainers were sceptical toward the feasibility of standardised welfare assessments, favouring individualised assessment. Furthermore, participants defended their professional autonomy, highlighting relationships between stakeholders and reinforcing the importance of recognising relevance and practicalities in future research generation.

Discussion & Conclusions: Findings show that while trainers are receptive to scientific research, its application remains supplementary to experiential knowledge and shaped by structural constraints, including time, workforce, and practical feasibility. Informal and observational approaches to welfare assessment, alongside scepticism toward standardised frameworks, further reflect the importance placed on individual horse and human-horse interaction. Whilst this may limit the consistency and transparency of welfare evaluation across the industry, these insights suggest that

improving evidence uptake requires not only greater accessibility but also enhanced trust and closer alignment with realities of training contexts. Furthermore, this study demonstrates how trainers perceive and engage with research, highlighting opportunities to better support the development of evidence-based approaches within training practice and addressing a key gap in understanding the research-practice relationship within horseracing. This is particularly important for maintaining horseracing's SLO through transparent and credible welfare practices. Recommendations include addressing structural barriers, presenting research in accessible formats, and strengthening collaboration to support more relevant and implementable approaches to research and practice.

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An investigation into barriers preventing weight loss in UK native horse breeds

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Keywords: Obesity; exercise; welfare; equine professionals

Introduction: Obesity is a current welfare concern affecting a large percentage of the UK leisure horse population (Furtado *et al.*, 2021). Whilst research has investigated management practices to support weight loss in horses (Ross *et al.*, 2024), limited research has focused on the practical application of these. Therefore, the aim of the project was to investigate barriers owners faced when implementing weight loss management techniques.

Materials & Methods: The study utilised qualitative methods in the form of semi-structured interviews. Ten participants were recruited, who had owned or loaned a native horse that lost 50kg or more on a weight loss programme. Interviews were conducted over MS Teams and questions related to experiences when restricting the feed intake of their horse related management practices. Braun and Clarke (2017) six-step thematic analysis was used to analyse transcripts.

Results: The four main themes identified included identifying and initiating weight loss, management of the horse, ability to exercise the horse, and external influences on management practices. Owners faced psychological and physical barriers when initiating weight loss techniques. Embarrassment and naivety accompanied obesity realisation, yet participants reported guilt when restricting feed. Track systems, although successful, presented financial and locational complications. Soaking forage presented infrastructural problems and when visibly restricting intake, peer and public interference occurred. Horse welfare was prioritised by owners; restriction techniques that negatively impacted welfare in any way were discontinued. The ability to exercise the horse was integral to weight loss and posed a significant barrier for half of participants as exercise increase was impeded during the programme by injury. Equine professionals played a pivotal role in shaping weight loss techniques, and outweighed peer feedback.

Discussion & Conclusion: Owners face multiple barriers during weight loss programmes, which are impacted by the physical and social environment the horse is kept in. Findings suggest movement and exercise are critical to weight management of native ponies. Owners place welfare as priority whilst altering management, and current use of equine professionals to support weight loss warrants further research.

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From Barriers to Solutions: How United Kingdom (UK) horse owners promote positive affective states for their horses

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Keywords: Equine Welfare, stable management, behaviour change

Introduction: Equine welfare concern has increasingly shifted from preventing negative affective states to actively promoting positive experiences, emphasised by the Five Domains Model (Mellor et al., 2020). Previous research identified perceived barriers preventing UK horse owners from promoting positive equine experiences. The largest perceived barrier was livery-yard restrictions, followed by limited resources, knowledge gaps, tradition and peer pressure highlighting structural and social constraints faced in equestrian settings. This study explored solutions or strategies that UK owners currently use to overcome barriers to promote positive equine affective states.

Materials & Methods: A cross-sectional, mixed methods survey was disseminated online to UK horse owners. The questionnaire was hosted using JISC Online Surveys and included demographic questions, Likert-scale ratings of previously recognised welfare barriers and open-ended questions exploring the solutions or strategies owners used to overcome barriers to promoting positive equine affective states. Quantitative data were summarised while qualitative responses were analysed via thematic analysis (Braun & Clarke, 2006). Open text responses were coded and organised into themes identifying solutions or strategies promoting positive affective states.

Results: A total of 324 UK horse owners completed the questionnaire. Quantitative data rating the severity of perceived barriers identified natural living limitations and livery yard restrictions as the most reported. Five higher order themes were identified: environmental adaptations, management adaptations, non-solution or avoidance strategies, recognition of equine specific needs and knowledge/support seeking. Respondents described modifying turnout arrangements, adapting stable design, providing enrichment and adjusting routines to encourage natural equine behaviours such as movement, social contact and foraging. Some owners moved livery yards and made personal sacrifices to prioritise equine welfare.

Discussion & Conclusions: Despite structural, social and economic barriers, UK owners in this study were highly motivated to promote positive affective states for their horses. However, as the survey was distributed through online equestrian networks and participation was voluntary, the nature of the survey may have attracted owners more engaged with equine welfare. Many strategies involved small scale environmental and management adaptions within the owner's control. Many adaptations were aimed at increasing opportunities for social interaction, movement and foraging. This suggests owners recognise the importance of equine specific needs to support positive welfare outcomes. However, not all owners were able to overcome their perceived barriers. Some respondents described avoidance strategies to manage social pressure, and others moved yard or bought their own land to gain more control over their horses' environment and management.

These results highlight that UK horse owners who responded to this survey play an active role in navigating the structural, social and economic constraints that influence equine management. The solutions described were often practical and context specific, suggesting that promoting positive equine welfare is not only dependant on knowledge or intention, but the opportunities available within the environment and everyday management. Solutions and strategies described by owners highlight how the interaction between capabilities, opportunities and motivations shape welfare decisions. Recognising and sharing practical owner-led solutions may inform future equine welfare guidance and communicate practical pathways for improving equine welfare in domestic management settings.

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Mitigating the strangles vaccine effect on recumbency times in stabled horses with phenylbutazone

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Keywords: recumbency; strangles vaccination; phenylbutazone; computer vision

Introduction: Strangles vaccination is an important part of equine disease management; however, adverse reactions such as swelling, pain, and reduced appetite are reported (Strangvac, no date). There are no reports on how this impacts horses' 24-hour time budgets or sleep patterns. This study aimed to document the effect of strangles vaccination on recumbency times and determine whether phenylbutazone administration altered this. (Sternal and lateral recumbency enables horses to have deep or REM (rapid eye movement) sleep) (Greening and McBride, 2022).

Materials & Methods: The study population was a group of stabled military horses, continuously monitored with a computer vision system (Equiconnect, by VetVision AI*) as part of an enhanced health and welfare monitoring programme. This monitors 24-hour time budgets, including eating, standing, sternal and lateral recumbency times. Computer vision models for recumbency had been validated by a human veterinary surgeon, with a mean absolute error of 3.6 seconds for lateral, and 10.8 seconds for sternal recumbency per 1hr period. Validation of model performance was performed blind to model results, and on novel cases not utilised in model training to avoid overfitting. Primary vaccination: Following a high incidence (27/83 (32.5%)) of reactions to a routine planned primary strangles vaccination, computer vision monitored time budget data were retrieved for 2 days prior and 2 days post vaccination. Data were available for up to 79 horses per day. A mixed effects model was utilised to model associations between primary vaccination and lateral, sternal, and total lying times, with "horse" as a random effect. Second vaccination: Phenylbutazone was administered with the second Strangles vaccination to horses stabled on one side of each yard ('bute'), while horses on the opposite side received the vaccination only ('nobute'). Recumbency data were available for 18 horses, matched within yards (11 'bute', 7 'nobute') from 2 days prior to 9 days post vaccination.

Results: Primary Vaccination: Median total lying time decreased from 231min/d (SD 154min/d) pre-vaccine, to 87min/d (SD 87min/d) post-vaccine, and median lateral recumbency time decreased from 31min/d (SD 77min/d) to 8min/d (SD 37min/d), with 92% of horses having <30min lateral recumbency 48hr post-vaccination. Mixed effect models demonstrated a significant decrease in total recumbency time post primary vaccination (95% CI 114-174min/d, $p<0.001$), and a significant decrease in lateral recumbency of 36min/d (95% CI 21-50min/d, $p<0.001$).

Second Vaccination: Both 'bute' and 'nobute' groups had shorter recumbency times on the day of second vaccination (Day). Horses receiving 'bute' returned to pre-vaccination recumbency times from Day 1 post-vaccination. 'Nobute' horses had reduced lying times through Days 1-5 post-vaccination, and no lateral recumbency on Days 2-4 post vaccination Mixed effect models demonstrated a significant difference in lateral recumbency times between the 'bute' and 'nobute' groups (95% CI 1.4-42 minutes, P=0.036); bute horses had 21.7 minutes more lateral recumbency than 'nobute' horses.

Discussion & Conclusions: Primary and secondary strangles vaccination was associated with a significant reduction in recumbency time; phenylbutazone administration significantly improved this. These findings should be considered when planning management and exercise of horses' post-vaccination. Further studies investigating interventions to reduce adverse effects are needed (Zoll et al., 2013).

Ethics: The study was reviewed and approved by the Committee for Animal Research and Ethics (CARE), School of Veterinary Medicine and Science, University of Nottingham. Approval number: 4549 021225

Acknowledgements: The authors would like to thank the staff at The Kings Troop Royal Horse Artillery and Vet Vision AI for their assistance with data collection.

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* EquiConnect. https://www.equiconnectai.com/ Accessed 23.3.26

The Effects of Equiball™ on Behaviour and Biomechanics in Horses.

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Keywords: Therapy; Equiball™; Behaviour; Kinematics

Introduction: Therapeutic modalities are increasingly used in equine training and rehabilitation to enhance musculoskeletal function and promote relaxation through increased peripheral circulation and reductions in muscle tension, heart rate, and behavioural stress indicators (Jastrzębska *et al*., 2025). Behavioural indicators provide a practical non-invasive measure of relaxation, though evidence linking such therapies to locomotor changes is limited. This study investigated Equiball™ effects on behaviour and gait kinematics in horses walking on the flat and over poles. Pole exercise enhances limb flexion and proprioceptive engagement (Walker *et al*., 2022). It was hypothesised that behavioural indicators of relaxation and kinematic parameters (range of motion, stride length, frequency) would increase following Equiball™ application.

Materials & Methods: Horses (*n*=8, 6–14 years) participated in a repeated-measures design, each serving as its own control. They were tested at walk on the flat and over poles, with and without Equiball™ application. Conditions were randomised and pole spacing standardised (12m). The Equiball™ was heated and applied (5–10 minutes) using light circular pressure over major superficial muscle groups involved in posture and locomotion: brachiocephalicus, splenius, trapezius, longissimus dorsi, gluteals, biceps femoris, semitendinosus, and proximal limb musculature. Behaviour was recorded using an ethogram (Matlock *et al*., 2025), and kinematic data analysed with Kinovea. Observations included pawing and calm standing at rest, and behaviour during walking. Two-dimensional analysis quantified carpal and tarsal joint angles, stride length and frequency. Speed (m/s) was calculated from stride distance/time. Behavioural and kinematic data were analysed using chi-squared tests and repeated-measures ANOVA.

Results: An increase in licking and chewing (50 % flat; 63 % over poles, χ^2 (1) = 10.5, $p < 0.01$), and a decrease in tail swishing (14 % flat; 36 % poles) under both conditions at walk and ears back decreased (37 %) on the flat following Equiball™ application (Figure 1). There was a 51 % reduction in pawing (χ^2 (1) = 4.57, $p < 0.05$) and a 27 % increase in calm standing at rest. Horses demonstrated increased flexion of the carpal joint ($p < 0.001$) over poles. Walking speed (mean ± S.E.M) increased on the flat following treatment (1.53 ± 0.07 m/s vs 1.62 ± 0.07 m/s), whereas a slight decrease was observed over raised poles (1.76 ± 0.08 m/s vs 1.70 ± 0.08 m/s).

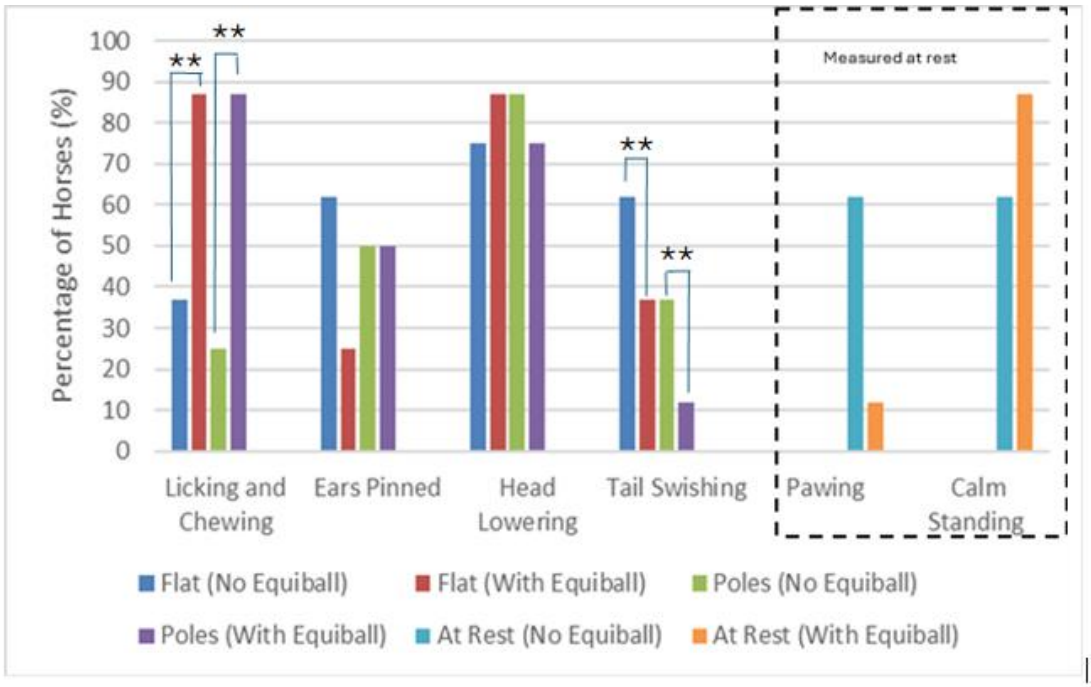

Figure 1. Behavioural parameters of relaxation in horses (*n*=8) treated with the Equiball™ under different conditions (rest, walking on the flat and over poles). Pawing and calm standing behaviours were recorded during rest periods rather than during locomotion. Statistical significance (p <0.01) is denoted by an asterisk (*).

Discussion & Conclusion: Behavioural changes after Equiball™ treatment at rest and walking on the flat or over poles occurred. Pawing was reduced at rest and licking and chewing increased in walk (flat and poles). These are commonly associated with relaxation and suggest a calmer state. No clear differences were observed in head lowering or ears pinned across conditions, indicating less sensitivity to treatment effects or influence of task demands. Kinematic analysis showed increased carpal joint flexion during pole work, consistent with findings by Walker *et al.* (2022). Changes in stride parameters and speed were observed, although not consistent across both conditions. Further research is needed to explore Equiball™ effects on kinematics, as previous unpublished findings showed an increase stride length.

N.B. Due to ongoing analysis for wider projects involving confidentiality agreements with the manufacturer of EquiballTM it is not possible to disclose data for outcome measures, particularly the kinematic parameters at this time.

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Letting the dust settle: an investigation into air quality in equine arenas

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Keywords: particulates; harrow; surface; respiratory

Introduction: Research into equine arena surfaces and air quality has highlighted the impact that surface materials and high concentrations of airborne particulate matter (APM) can have on respiratory health in horses. Surface maintenance practices, such as harrowing, are essential for maintaining safe and functional footing but often disturb surface particulates, increasing the likelihood that these particles become airborne and respirable (Dreyer-Rendelsmann et al., 2017). Despite existing research, there is still extensive opportunity for further investigation into mitigation techniques for the reduction of negative impacts on respiratory health, following arena surface maintenance. The study therefore aimed to investigate arena air quality by measuring the mass concentration of airborne particulate matter before and after harrowing in both indoor and outdoor riding arenas.

Materials & Methods: Air quality was assessed by measuring APM concentration in both indoor and outdoor arenas, before and after harrowing. A DustTrak™ DRX Aerosol Monitor 8533 was used to record APM mass concentration (PM1-PM10), with each arena sampled three times over a four-week period. Environmental variables, including ambient temperature, humidity, wind speed, and rainfall were measured using a Kestrel 5400 WBGT Heat Stress Tracker and a rain gauge. Surface moisture content was determined using dried surface samples. Differences between arenas and maintenance practice were analysed with Kruskal-Wallis and relationships between APM and concentration and environmental conditions were assessed with Spearman correlation, both using Minitab™.

Results: APM concentration was significantly higher in the indoor arena (0.01 ± 0.03 mg/m³) than in the outdoor arena (0.01 ± 0.01 mg/m³). There was no significant difference ($p>0.001$) in APM concentrations between ground level and horse nose height. In the indoor arena, APM concentrations increased from before harrowing (0.01 ± 0.04 mg/m³) to immediately after harrowing (0.02 ± 0.03 mg/m³), followed by a reduction at 30 minutes post harrowing (0.02 ± 0.02 mg/m³). In the outdoor arena, all harrow treatments were significantly different ($p<0.001$) from each other. Environmental variables showed negative correlations between APM concentration and both humidity and wind speed, while there was a positive correlation between temperature and APM concentration in the outdoor arena only ($r=0.688$).

Discussion & Conclusions: The higher APM levels recorded in the indoor arena support existing concerns about poor ventilation contributing to respiratory risk, including the development of conditions such as equine asthma. It is recommended that ventilation capacity is maximised to mitigate risks to equine respiratory health (Aminossadati, Leonardi and Sadeghi, 2025). Consequences of poor air quality often include the development of respiratory diseases, such as equine asthma (Mańkowska and Witkowska, 2024), which is detrimental to equine health and welfare. The marked rise in particulates after harrowing indicates that surface maintenance temporarily increases respirable dust, particularly indoors. Allowing a settling period after

harrowing and improving airflow are therefore important for reducing exposure. These findings highlight the need for management strategies that mitigate short term dust spikes and support equine respiratory health.

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Jump Then Fall: A Preliminary Study into the Effects of Clavicle Injury on Muscle Activity in Work Riders and Jockeys

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Keywords: Horseracing; Biomechanics; Electromyography; Performance

Introduction: There is an element of risk within horse sports, and in racing, 50% of falls result in rider injury (Newton et al., 2025). In racing, 32% of fractures occur in the shoulder girdle region, and 73% in flat and 71% in jump racing; of these, the most common are clavicular fractures (McCrory et al., 2006). A jockey relies on fine motor skills and upper body control, and clavicle injuries may disrupt musculoskeletal function due to the clavicle's role in load transfer, upper body movement, and stability (Legg et al., 2023). This study aimed to investigate the impact of clavicle fractures upon muscle activity in jockeys and work riders.

Materials & Methods: A survey was distributed on social media to gather information on injury history, treatment, rehabilitation, and perceived performance impact (n=13). A subsequent physical assessment of work riders and jockeys using electromyography (EMG) technology (n=4) who met inclusion criteria (≥3 years riding experience, no clavicle injury within 3 months of data collection, no other musculoskeletal issues). Delsys Trigno Avanti sEMG sensors were placed on the middle of three muscles on both sides of the body: Sternocleidomastoid, Deltoid, and Trapezius. Riders were assigned to a control group (no fracture, n=2) or an injured group (previous fracture, n=2). The riders rode a Racewood mechanical horse, where they were habituated using the auto-train function. Control measurements were taken using the auto-train function. Data were collected on the left and right reins for 1 minute in racing position. EMG data were processed as Volts in EMGWorks and analysed using a General Linear Model in R Studio to provide detailed insight into the relationship between injury and muscle activity.

Results: Statistical analysis showed that clavicle injuries do not have an effect on the overall muscle activity of any muscle of work riders and jockeys, with no significant difference between riders who had previous injury and those without ($p=0.72$). There was no significance between each sensor individually. There was no significant difference between the asymmetry scores of each muscle of previously injured and non-injured riders ($p=0.27$, $p=0.14$, $p=0.80$). There was a significant difference between the left and right sides of each muscle within each group. The survey had 13 respondents, eight of whom had previously broken their clavicle. The injury types were mixed, and the management varied between respondents. 75% stated they felt their injury affected their performance.

Discussion & Conclusions: The study indicates that prior clavicle fractures did not affect muscle activity during simulated riding, suggesting that during low-intensity riding tasks, prior clavicle injury does not produce substantial neuromuscular changes in the upper body. Although a significant difference between the muscles on each side was demonstrated within each group, it did not translate into significant differences in the overall asymmetry between the groups. This suggests

that, regardless of injury history, asymmetry is present in all riders. Therefore, this may reflect normal biomechanical patterns rather than injury-related compensation. Although survey respondents' self-perception of injury upon performance was not reflected in EMG, the absence of EMG differences does not imply that the injury has no musculoskeletal effects elsewhere. Future developments in this research area may benefit from a larger sample size, specialising in more severe breaks and factoring in management practices.

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Monitoring normal equine behaviours using artificial intelligence

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Keywords: Computer-vision; Machine-learning; behaviour tracking

Introduction: To maintain equine welfare, it is essential to understand and monitor normal horse behaviour (Giannone et al., 2025). Horses exhibit behaviours that reflect their overall wellbeing, physical health and emotional state. Painful conditions, such as colic, can cause deviations to a horse's normal behavioural pattern. Currently, it remains difficult to continuously and objectively monitor a horse's behaviour, relying on subjective human observation, over a relatively limited time-period (Kil et al., 2020). This is fraught with challenges, such as missing early and subtle behavioural changes indicating disease or poor welfare. Advances in artificial intelligence, specifically machine-learning, offer opportunities to automate this process (Cetintav and Yalcin, 2025), enabling accurate and continuous monitoring systems. The aim of this project was to validate a machine learning algorithm for tracking common behaviours of stabled equids, by comparing to human observation. This will form the foundation of an automated colic detection alert system.

Materials & Methods: 24-hour CCTV videos were collected from 10 horses at 1 frame-per-second, across 3 different sites. A human observer manually labelled every second to provide the 'ground-truth' dataset. The labels given were 'standing', 'eating', 'lying-lateral', 'lying-sternal' and 'out-of-stable'. The same video frames were analysed by a pre-trained, object detection model (EquiConnect, VetVisionAI) to produce predicted behavioural labels. Model outputs were then compared to the human labelled dataset to produce performance outcomes determining the model's accuracy in classifying equine behaviours. Results were generated and analysed in Python, using MatPlotLib and Seaborn, by comparing blinded human time budgets with computer labelled time budgets to determine mean absolute error (MAE) for each 1-hour video.

Results: The model performed well when detecting 'lying-lateral' and 'lying-sternal' behaviours, as well as 'out-of-stable', with MAE values of 0.06, 0.18 and 0.63 minutes respectively. These times represent the difference between the model prediction and the 'ground truth' from the human scores. The MAE for 'eating' was 5.79 minutes and for 'standing' was 6.21 minutes.

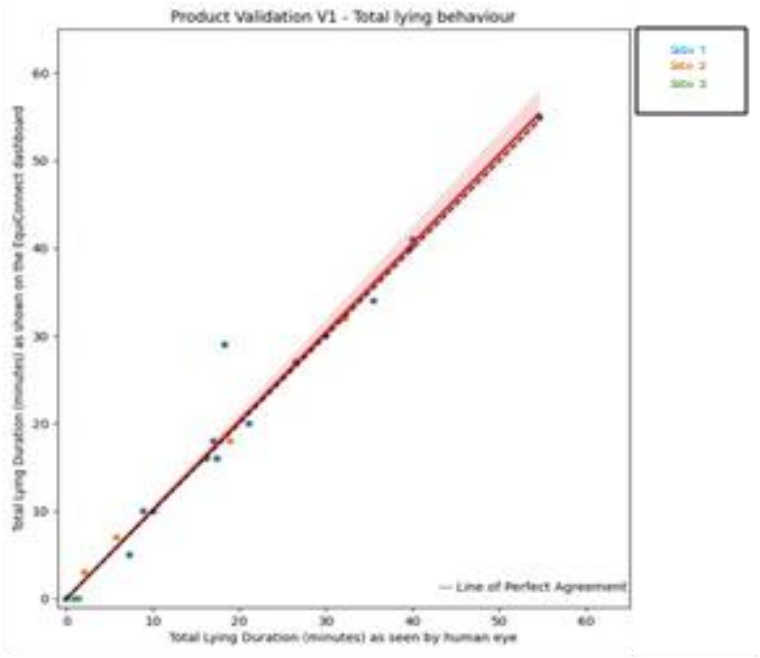

Figure 1: Graph comparing the human 'ground truth' vs CV for total lying behaviour

Discussion & Conclusion: This study demonstrates the potential to use an object-detection model to continuously monitor equine behaviour. The results show good agreement for both lying behaviours and detecting when a horse leaves the stable. It's likely that the model achieved less accurate results for other behaviours due to overlapping characteristics between classes, forage source, environmental conditions and camera angle/ obstruction. Improving the model performance could be achieved by increasing post-processing and expanding the training dataset. Overall, this study supports the feasibility of applying machine-learning to automate equine behavioural monitoring. With continued refinement of data collection and the overall modelling approach, reliable and accurate results should be achievable for both normal behaviours and signs indicative of illness such as colic or gastric ulcers.

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Calculating percentage bodyweight loss in overweight horses and ponies from morphometrics.

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Keywords: Equine obesity; tail circumference

Introduction: Equine obesity is a significant global health issue implicated in insulin dysregulation (ID) and laminitis, affecting up to 70% of horses (Garland et al., 2025). Current obesity assessment involves subjective measurements of body condition, (body condition scoring) (BCS) ≥7/9. Weight loss improves when changes are accurately monitored, but BCS monitoring is a less effective tool when used in obese equids (Dugdale et al., 2011). Simple, inexpensive, clinician and owner-friendly measurements that accurately monitor body weight loss (BWL) are needed (Furtado et al., 2018). Study aim: to establish if morphometrics, including a novel tail circumference measurement can accurately predict BWL in overweight equids.

Materials & Methods: Ethics approved (Hartpury University – ETHICS2023-152): A longitudinal, multi-centre study of privately owned, overweight (BCS ≥7/9), mixed breed, age, sex and exercise status (exercised ≥30mins, ≥3/week, n=23 and non-exercised <30mins, 3<week, n=6), horses (n=21) and ponies (n=8), were monitored during a weight loss programme. Programmes were structured to achieve 1% BWL/week (ref) and supplied 85% DE requirement, (NRC 2007). Equids were observed five times at 6-week intervals, (total 24 weeks). Replicate measurements by same observer were taken same time of day, no exercised in the previous hour, horses on a level surface. The circumference (mm) of select anatomical points (the base of the neck (NC), girth (GC), waist (WC) and the tail at the ischial tuberosity (TC)) measured with a tailor's tape-measure (FABULOUZ 3M/10ft). Animals were weighed on a calibrated weighbridge (EQU13). Data were expressed as % change from Day-0, any data from clipped/pulled tails were excluded prior to analysis. Data were analysed via multivariate mixed effects model in R version 4.5.3 (2026-03-11, ucrt), with horse, and repeated measures as random effects and exercise status, season and time as fixed effects.

Results: The equids lost ∑947kg (6.4%%BWL SD±0.04) over the 24 weeks with a 79% posterior probability that BWL in exercised > non-exercised. BWL trajectory was similar between groups. NC, GC and WC were all strong predictors of %BWL, in exercised, whereas WC and TC were strong predictors of %BWL in non-exercised equids (Table 1).

Table 1: Morphometrics prediction of % bodyweight loss in exercised and non-exercised horses and ponies

	Exercised horses and ponies				Non-exercised horses and ponies			
Morphometric	**Mean slope**	**95% CrI**	**Posterior P(slope .0)**	**Interpretation**	**Mean slope**	**95% CrI**	**Posterior P(slope .0)**	**Interpretation**
Neck Circumference	0.25	0.11 to 0.42	0.999	Strong predictor	0.01	-0.30 to 0.32	0.54	No evidence of predictive value
Girth Circumference	0.5	0.23 to 0.77	0.999	Strong predictor	0.21	-0.45 to 0.88	0.74	Weak, uncertain predictor
Waist Circumference	0.19	0.07 to 0.31	0.999	Strong predictor	0.33	0.11 to 0.58	0.999	Strong Predictor
Tail Circumference	0.07	-0.03 to 0.16	0.905	Weak predictor	0.38	0.08 to 0.66	0.992	Strong Predictor

Discussion & Conclusion: Morphometrics differed in their ability to predict %BWL, with clear distinctions between exercised and non-exercised. Exercised horses showed a broader set of predictive morphometrics, particularly NC, GC, and WC demonstrating the combined effect of calorie deficit and exercise related changes. This agrees with Garland *et al* (2025) who reported that exercise stimulated weight loss in anatomical regions that are indicative of metabolic fat deposition associated with ID. In contrast, in the non-exercised group the WC and TC emerged as the strongest predictors of %BWL, reflecting the changes induced by calorie restriction alone. The new site of TC used in this study was an effective way of monitoring BWL in non-exercised equids.

Acknowledgements: This study was partially funded by Equinutrition®, Independent Equine Nutritionist.

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Thoracolumbar Kinematics across surfaces: Investigating the effects of hand walking and long-reining in equine.

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Keywords: Rehabilitation; movement; back; horse

Introduction: Back pain remains a leading cause of reduced performance and career longevity in athletic horses, driven widespread use of early-stage rehabilitation strategies such as surface selection and low-intensity exercises, including hand walking and long reining. Long reining is proposed to enhance coordination and straightness through tactile limb guidance, while encouraging a low-and-low outline that stabilises thoracolumbar and abdominal muscles via the bow-and-string mechanism (Cottriall, Ritruechai and Wakeling, 2008; Harrison *et al.*, 2025). Soft surfaces are also commonly selected for early rehabilitation due to reduced limb loading and increased mobility. This study aimed to investigate the effects of hand walking versus long reining in equine back kinematics across hard and soft surfaces.

Materials & Methods: Six horses (age 12.67 ± 3.39 years; height 161.71 ± 6.36 cm) participated in a within-subjects repeated-measures study quantifying thoracolumbar flexion-extension, lateral bending and axial rotation across four regions of the back (thoracocranial, thoracocaudal, thoracolumbar and lumbosacral junction). Nine IMU sensors were positioned on nine anatomical landmarks (poll, withers, T13, T18, L1, left and right tuber coxae, S1 and tail) to calculate thoracolumbar motion data. With a minimum of 25 consecutive strides analysed for each horse under hard and soft surfaces during hand walking and long reining. Repeated trials were analysed using repeated-measures ANOVA in IBM SPSS v31.

Results: In the thoracolumbar region (T3-T13), flexion-extension increased significantly on soft surfaces ($F(1,5)=13.668$, $p=0.014$), while hand walking produced greater lateral bending $F(1,4)=8.457$, $p=0.044$) and axial rotation ($F(1,4)=46.379$, $p=0.002$), indicating long-reining effectively reduced these movements. Thoracocaudal (T13-T18) flexion-extension was only significant during long-reining ($F(1,5)=35.588$, $p=0.002$), with no other significant differences across surfaces or interaction. No significant changes were identified at the thoracolumbar junction (T18-L1). At the lumbosacral region (tuber coxae–S1), lateral bending ($F(1,5)=13.587$, $p=0.014$) and axial rotation ($F(1,5)=24.005$, $p=0.004$) increased significantly on soft surfaces, with no significant effects of exercise type or interaction.

Discussion & Conclusion: Thoracolumbar kinematics were influenced by both exercise type and surface condition. Long-reining reduced lateral bending and axial rotation while increasing flexion-extension, supporting its role in early rehabilitation where controlled sagittal-plane movement and improved postural stability are essential for managing back pain and re-establishing coordinated spinal function. Although soft surfaces are often selected for their reduced concussive loading, the increases in thoracocranial flexion-extension and lumbosacral lateral bending and axial rotation suggest that deeper surfaces such as sand place greater demands on spinal control. They may therefore be more appropriate once stability has improved and the goal shifts toward developing suppleness and lateral mobility. Hard surfaces, with minimal shock absorption and reduced spinal engagement, pose greater concussive risk and are unsuitable for early rehabilitation

beyond controlled walking (Hobbs *et al.*, 2014). Although grass surfaces were not included in this study, they may offer an intermediate option, providing moderate shock absorption without the increased spinal demands of deeper footing. Overall, these observations reinforce the clinical value of long-reining, hand walking, and evidence-based surface selection when constructing rehabilitation programmes tailored to individual horses and their specific pathological requirements.

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Investigation into Event Rider Perception of Ground Conditions and its Effect on the Studs Used for Cross-Country

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Keywords: Surface properties; subjective assessment

Introduction: Screw-in studs are used during the cross-country phase of eventing to enhance hoof grip; however, research is limited on what stud types should be used in different ground conditions. Stud selection relies on rider experience and subjective judgement (Harvey, Williams and Singer, 2012). Slip distance is important for reducing limb loading; forward sliding of the hoof allows energy dissipation, decreasing limb stress from ground reaction forces. Studs can alter slip distance, potentially increasing the risk of concussive or soft-tissue injuries. Existing literature highlights that decreased slip may elevate concussion-related risk (Parkes and Witte, 2015), reinforcing the need for evidence-based guidance to support rider stud choices that optimise performance while protecting musculoskeletal health. This study therefore aimed to investigate rider perceptions of ground conditions and examine how these influence stud selection across a range of competition environments.

Materials & Methods: Data were collected across ten British Eventing (BE) competitions during 2021 and 2022, including BE Intermediate, CCI3*S, CCI3*L, and CCI4*L levels. Cross-country ground was measured using the Vienna Surface Tester (firmness, stiffness and energy restitution), Lang penetrometer (grip) and a moisture meter (percentage volumetric water content) prior to the event starting, variability was calculated from the measured values. Immediately after finishing the cross-country, riders completed a questionnaire evaluating the ground conditions using visual analogue scales. Additionally, riders were asked to state the stud types they had used. Overall, 196 surveys were completed. Relationships between rider-reported and instrument-measured ground variables were analysed using Spearman correlations in R-studio. Patterns in stud selection were examined using chi-squared goodness-of-fit tests.

Results: There were weak relationships between coefficient of variability (ground) and uniformity (rider), cushioning (ground) and cushioning (rider), and grip (ground) and grip (rider), with significance between the correlations for cushioning (RHO = 0.28, P = <0.01) and grip (RHO = 0.20, P = <0.01). Chi-squared showed stud selection was not evenly distributed. Medium (13-18mm length) studs were used more frequently than small (0-12mm) or large (19-25mm) studs in front shoes, while medium and large were used almost equally in hind shoes. This was consistent over good-to-soft (C^2 = 106.35, P = <0.001), good (C^2 = 56.771, P = <0.001) and good-to-firm (C^2 = 55.043, P = <0.001) going. Conical and dome studs were the most chosen across all courses, whereas road and arena studs were used least.

Discussion & Conclusion: The weak correlations between instrument-measured and rider-reported ground parameters indicated that riders were not consistently able to identify ground conditions, reflecting a gap between subjective perception and objective footing assessments. Several factors may explain this discrepancy, including individual rider interpretation and the influence studs made on the rider evaluation. Stud selection patterns further support this disconnect. Stud types used by riders were similar for every course irrespective of ground conditions, despite evidence suggesting that stud choice would be influenced by the type of

going. Current rider decisions may be driven by habit or preference rather than by an understanding of biomechanical implications. Evidence-based guidance to support interpretation of ground conditions and relevant stud choices could play a part in improved musculoskeletal health.

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Rider weight limits in equestrian sport: A systematic review to inform welfare and industry policy

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Keywords: Physiology; Sustainability; Psychology; Performance

Introduction: Rider weight limits are utilised in equestrian sport, despite inconsistent and limited supporting scientific evidence. Concerns have been raised that increased rider weight may elevate equine biomechanical and physiological strain (Dyson et al., 2019), while pressures around weight management may negatively influence rider psychology, thereby threatening sustainability in the industry. A clearer synthesis of the current literature helps clarify the wider impact of weight limits on both riders and horses to inform holistic policies. Improving policy may better support horse welfare while considering the riders and businesses involved, thereby also improving social licence to operate and sustainability. This systematic review, therefore, aimed to assess the current evidence on the impact of weight-bearing and weight limits on horses and riders to address gaps in evidence-based policy and in the quantification of weight limits.

Material & Methods: A predefined search strategy and eligibility criteria were used, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Searches were completed across PubMed, Scopus, and Nottingham Trent University Library One Search, with additional grey literature sourced from UK governing bodies' policies to ensure current regulatory perspectives were represented. The search initially identified 127 papers; 22 met the inclusion criteria after removing duplicated using RefWorks. Empirical studies were appraised using the Critical Appraisal Skills (CASP) quality checklists. Grey literature was appraised using the Authority, Accuracy, Coverage, Objectivity, Date and Significance (AACODS) framework. After quality appraisal, 15 sources met the threshold for inclusion for thematic analysis using tabulation to manage sources into three key themes: rider horse ration recommendations, impacts on horses, and physiological and psychological impacts on riders.

Results: Findings indicated that increased rider weight was associated with elevated physiological strain in horses, including markers consistent with discomfort, such as heart rate. Thresholds varied across sources, with quantified policies despite no empirical evidence suggesting thresholds. Evidence also suggested an association between weight expectations and disordered eating, leading to physiological consequences such as high bone turnover (Waldron-Lynch et al., 2009). Other studies contradicted this, proposing that equestrian sport may improve the symptoms of disordered eating.

Discussion & Conclusions: Together, the findings suggest that an increase in weight-bearing increases the risk of physiological strain, with inconsistencies in thresholds likely the result of confounding factors. Variability suggests that current policies specifying fixed percentages may oversimplify weight limits. The review proposed that cultural expectations and performance pressures influence rider eating behaviours and weight to a greater extent than policy thresholds, highlighting the need for improved dietary education in the industry. Overall, this review contributes to the industry by supporting the development of contextualised policies that account

for multiple factors, such as rider experience and saddle fit, rather than relying on universal weight ratios. This work offers direction for future research, prioritising the quantification of weight limit thresholds using standardised methodologies and larger sample sizes, to improve clarity in industry policy for a sustainable future.

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The prevalence of diastema at tooth sites adjacent to or opposing excessive transverse ridges in equines

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Keywords: Dental charts; Equine Dental Technician; Maxillary; Mandibular

Introduction: Diastemata are abnormal gaps between teeth, a common equine dental pathology associated with food impaction, periodontal disease and oral discomfort (Dixon et al., 2012). Their prevalence has been reported within the equine population, with studies demonstrating both an increased occurrence in the mandibular arcade and a strong association with advancing age (Nuttall and Ravenhill, 2019). Excessive transverse ridges (ETRs) are occlusal abnormalities that may disrupt mastication and alter occlusal forces, potentially contributing to the development of diastemata (Dixon, du Toit and Dacre, 2011). However, the relationship between ETRs and diastema formation remains poorly defined. This study aimed to investigate whether the prevalence of diastemata is higher at tooth sites adjacent to or opposing ETRs in horses examined for a routine dental check-up.

Materials & Methods: Dental charts from 50 horses of a mixed breed population of predominantly leisure horses and including both live clinical cases (n=40) and cadaver specimens (n=10) with a mean age of 14.53 ± 7.28 years (range 2-26). Horses were examined and charted between October 2025 and March 2026, by a qualified and student Equine Dental Technician (EDT), then retrospectively analysed. A total of 428 interdental cheek tooth sites from 50 horses were evaluated. For each site, the presence or absence of diastema, adjacent ETRs and opposing ETRs was recorded. Diastema were defined as abnormal gaps between adjacent cheek teeth, and ETRs as excessive transverse ridges on the occlusal surface of cheek teeth. The arcade location (maxillary or mandibular) and age of the horses were also documented. Statistical analysis was conducted using SPSS. Chi-square tests were used to assess associations between the presence of diastema and both adjacent and opposing ETRs.

Results: Diastema were identified at 77 of 428 interdental tooth sites, representing a prevalence of 18.0% within the sample. Adjacent ETRs were present at 26 of the 77 diastema sites (33.8%). A statistically significant association was identified between diastema occurrence and the presence of adjacent ETRs (χ^2=8.117, p=0.004). In contrast, no statistically significant association was identified between diastema occurrence and opposing ETRs, with 33 of 77 diastema sites affected (42.9%) (χ^2 = 1.571, p = 0.210). Diastema were more frequently observed in the mandibular arcade (52 sites, 67.5%) compared with the maxillary arcades (25 sites, 32.5%). The mean age of horses included in the study was 14.53 years (range 2-26 years), while horses presenting with diastemata had a higher mean age of 18.68 years.

Discussion & Conclusions: The findings of this study suggest that diastemata are significantly associated with adjacent ETRs but not with opposing ETRs. This is particularly interesting given that opposing ETRs were more frequently observed overall, suggesting that their presence alone may not be sufficient to influence diastema formation. Instead, local occlusal abnormalities at adjacent sites may have a more direct mechanical impact, suggesting that the spatial link between the ETR

and the affected interdental space is more significant than overall prevalence. This supports the hypothesis that local occlusal abnormalities may contribute to diastema development. The increased prevalence of diastema in older horses observed in this study is consistent with previous research identifying age as a significant risk factor (Nuttall and Ravenhill, 2019). Additionally, the greater frequency of diastemata in the mandibular arcade aligns with existing literature describing similar distribution patterns (Dixon et al., 2012). However, as many diastemata occurred in the absence of adjacent ETRs, it is likely that multiple factors contribute to their development. Further research with larger samples sizes is required to better understand the role of occlusal abnormalities in equine dental pathology.

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Is artificial intelligence the future of dressage judging? The perspective of riders, coaches and judges.

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Keywords: Social licence to operate; Dressage; Artificial intelligence; Judging bias.

Introduction: Recent controversies in dressage stemming from welfare concerns and judging inconsistencies have resulted in the sports negative portrayal, threatening its longevity (Douglas et al, 2022; Wolframm et al, 2023). Artificial intelligence (AI) developments provide a potential solution through objective judging improvements, lessening social licence to operate (SLO) pressures. However, this threatens the subjectivity, central to the sport. Due to the technology's infancy, little validated research is available concerning stakeholder opinions on AI's implementation in dressage, or subjective sports. The unified theory of acceptance of use of technology (UTAUT) suggests stakeholder perceptions should be understood and considered, highlighting the importance of gathering stakeholder opinions, before introducing the technology. This study aimed to explore stakeholder perceptions, namely riders, coaches and judges, into the use of AI in dressage judging.

Materials & Methods: Ten semi-structured one-to-one interviews were conducted via 'Microsoft Teams,' following a pilot study. Consenting adult participants comprised three stakeholder groups; actively competing dressage riders (with a minimum of elementary level or above), current dressage coaches (with a minimum of BHS stage 3 Coach Award or equivalent) and current dressage judges (with a minimum of British Dressage List 4 or above), all with experience at a championship event. As nine out of the ten participants reflected more than one stakeholder group, participants identified and selected the stakeholder group (rider, coach or judge), that best reflected their main experience and were categorised as representative of that group. The qualitative data was analysed utilising Braun and Clarke's 6-step thematic analysis, due to the exploratory aim (Vaismoradi et al, 2013). This included the inductive, semantic generation of codes.

Results: Following analysis, four high-order themes were derived. These were 'The Desire for Change,' 'Implementational Awareness,' 'Humanisation in Dressage,' and 'Technological Takeover. Participants shared how, if introduced, AI should be an assistive tool, maintaining humanisation in the sport, whilst reducing errors. The initial codes, sub-themes and high-order themes can be seen in figure 1.

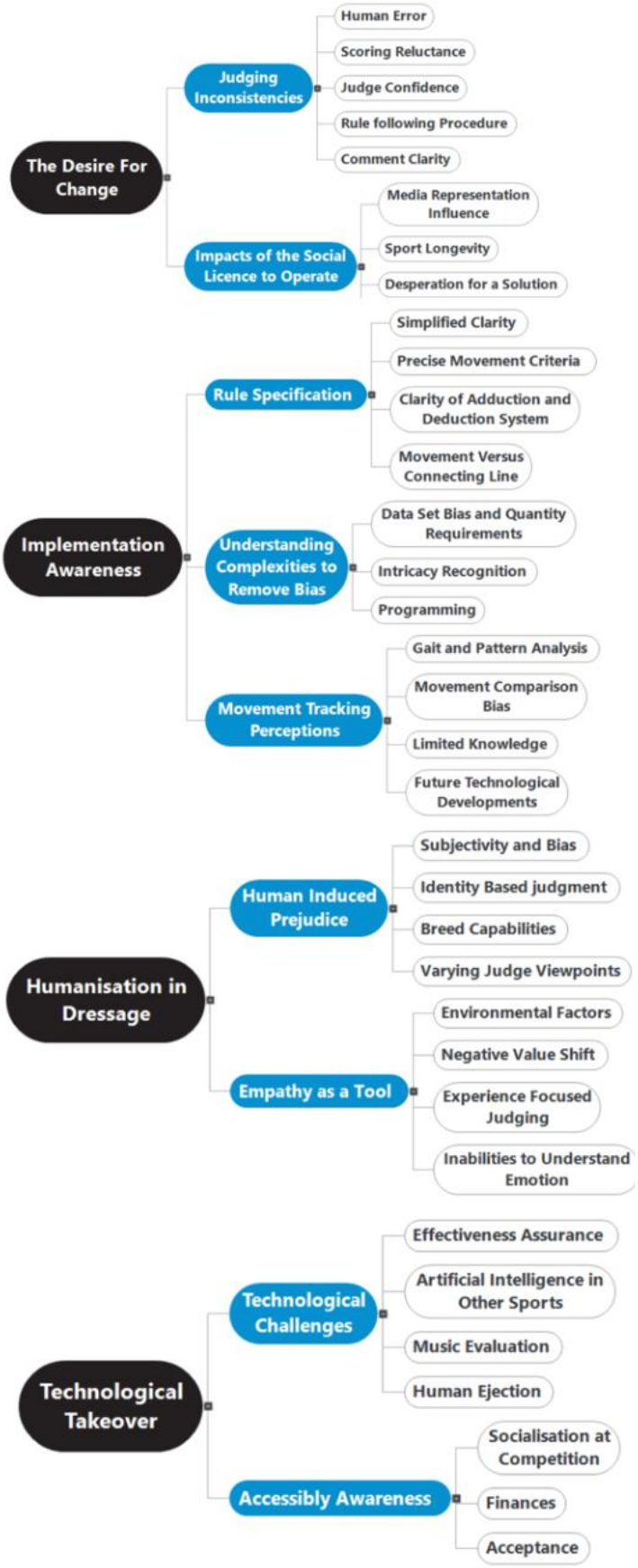

Figure 1: Emergent themes regarding the use of artificial intelligence in dressage judging.

Discussion & Conclusions: All participants were aware of the SLO and its implications, with 90% of participant stating AI would aid this. Riders and coaches expressed similar views regarding judging bias and error. The judges generally suggested systematic failings, by governing bodies are the root cause of errors. Overall, participants from all stakeholder groups expressed heightened concern regarding the way AI is implemented, not the actual introduction, ensuring it improves the sport and improves equine welfare. This reflects participants querying how the technology will understand the sports intricacies, human thought process and years of judging experience required. This research is significant in gaining an understanding of current dressage stakeholder views. This enables measures to be introduced regarding their concerns to ensure a smooth and successful introduction, with stakeholder backing and acceptance. From these findings, future research should resemble interviewing a diverse range of stakeholder groups, enabling a greater range of perspectives and a retrospective study reflecting upon successes or failings of AI's introduction within dressage.

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The effect of pole work on equine distal limb range of motion: A systematic review.

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Keywords: Rehabilitation

Introduction: Pole work is a commonly prescribed rehabilitation exercise to aid in improving joint range of motion (ROM), however there is minimal research into the true effects and benefits to equine distal limb ROM. The many varying possibilities for pole height and layout, as well as different surfaces the exercise can be performed in make it a highly versatile exercise for use in rehabilitation and training (Clayton *et.al.* 2015; Walker *et.al.* 2025). Further understanding of the effects of this exercise can help to develop the use and efficiency of pole work in a range of rehabilitation cases. This systematic review aimed to analyse the existing research surrounding the effects of pole work on joint ROM, and assess the implications for rehabilitation and performance.

Materials and Methods: A systematic review of existing research into pole work using the PRISMA guidelines. Three databases were searched for peer reviewed experimental trials and systematic reviews using sound horses to assess the effects of pole work on joint ROM in any language with "Horse" or "Equine" in the title (Figure 1). The quality of reporting was assessed using the ARRIVE essential 10 guidelines, and the ROB-2 and ROB-I risk of bias tools were used to assess the randomized controlled trials and randomized crossover trials that met the inclusion criteria.

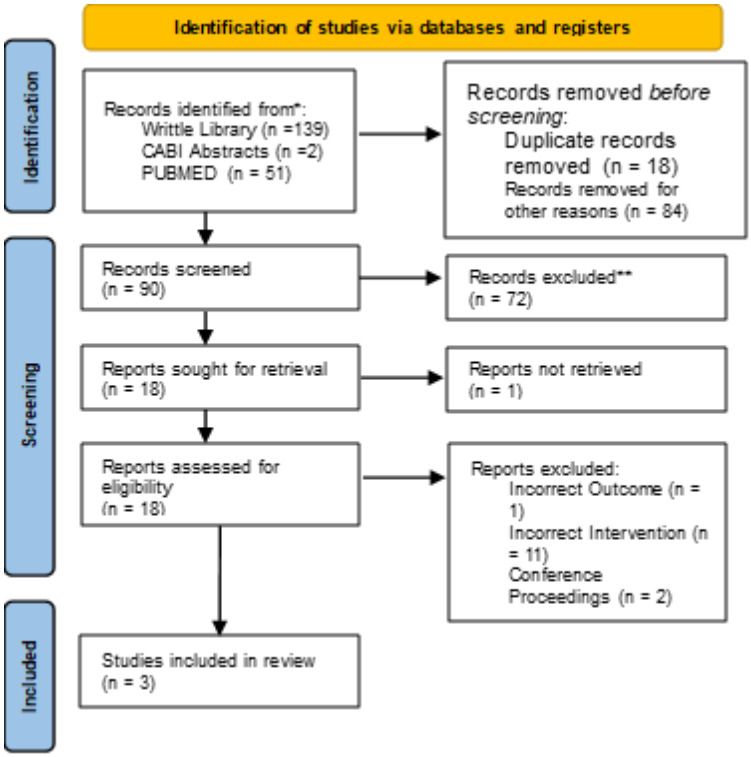

Figure 1: PRISMA flow chart of search string

Results: Three papers meeting the inclusion criteria were found to discuss the effect of poles at varying heights on joint ROM. Results were compiled into a PRIUS table of evidence showing increased joint flexion found in all papers to varying degrees. Whilst hip and shoulder flexion increased only with the introduction of poles, flexion and extension of the stifle, elbow, carpus and tarsus increased significantly with the increased height of poles. The metacarpophalangeal (MCP) and metatarsophalangeal (MTP) joint ROM increased with the introduction of poles and first raised height, however decreased as the pole height further increased. Whilst quality of reporting was lower than anticipated, the overall risk of bias was low, supporting confidence in the internal validity of the findings.

Discussion & Conclusion: Available evidence supporting the use of pole work in equine rehabilitation and conditioning is limited. However, the findings of included papers consistently demonstrate increased flexion and extension of distal limb joints when walking over poles. Papers assessing varying gaits reduces comparability of results and application to rehabilitation. Additionally, the restriction to sound horses also prevents translation to rehabilitation scenarios, particularly during controlled exercise at slower speeds. Given the widespread clinical use of pole work, further research in an injured population and across varying gaits is required to support evidence-based prescriptions.

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The impact of ADHD on competition in equestrian disciplines

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Keywords: Human-horse relationship: neurodiversity: equestrian sport

Introduction: Equestrianism is a popular activity in the UK with 23,600 children and young adults with a long-term health condition/disability partaking in some type of equestrian activity at least once a week. Equestrian sport involves harmony between horse and rider; Attention Deficit Hyperactivity Disorder (ADHD) has the potential to impact this harmony either positively or negatively. Due to the scarcity of literature on the subject, this study's aim was to explore the impact of ADHD in equestrian competition.

Materials & Methods: There were a total of 5 participants, all of whom were female equestrians, with a mean age of 32.5 years. Participants had either a clinical or educational diagnosis for ADHD; if they had neither, they completed the adult ADHD self-report questionnaire (Gray et al., 2014) to ensure they met the criteria for this study. The interview consisted of 20 questions and 4 follow up questions that were sent prior to the interview which was conducted using Microsoft Teams and recorded with the participants' consent. The interview had three core topics which were the rider's competition experiences, the impact of ADHD symptoms on performance and relationships, and the management of ADHD. After the interview, participants were signposted to support, and the data analysed using Braun and Clarke's (2006) thematic analysis approach.

Results: There were three main themes identified in the study: competition/training, rider management/quality of life, and living with ADHD/accommodations. The results indicated that participants struggled with symptoms like attention, concentration, time blindness and emotional regulation. Some participants found that since utilisation of coping strategies and self-management, they have had more positive experiences within equestrian competition, although there were challenges finding the right coping strategies. ADHD was shown to have effects on participants' sleep quality which could exacerbate symptoms and impulse control which impacted their diet. Relationships with coaches, peers and horses were found to play an integral role in performance and management of symptoms.

Discussion & Conclusion: The findings suggest that there is a higher prevalence of symptoms management when there is a good support system, leading to riders' ADHD potentially having a positive impact on competition. If these symptoms are not addressed or supported, then ADHD could have a negative impact on performance in equestrian competition. To help symptom management in future competitions a sport psychology consultant (SPC) could work with coaches and/or riders to support the management of symptoms and help develop coping strategies (Braun and Braun, 2015). Findings of the study also suggested a designated quiet place would be beneficial to minimise feelings of overwhelm caused by the busy competition environment, as well as the utilisation of extra time, which has been known to work in academic settings. Furthermore, some participants suggested the utilisation of test callers in dressage could be more of a normal practice and therefore make it more accessible for all, which has been shown to be beneficial for dressage riders in Ireland.

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Prevalence of peripheral caries in horses: a comparison between hay and haylage diets

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Keywords: Dental disease; Presence

Introduction: Dental disease is one of the most common health complications affecting domestic horses. Peripheral caries, characterised as the macroscopic destruction of the cementum that results from the dietary carbohydrates within the oral cavity to produce acids that dissolve the mineral components of the teeth (Jackson, Kelty and Tennant, 2017), are increasingly recognised in equine dentistry. In more advance cases, peripheral caries may contribute to periodontal disease and discomfort during mastication. Daniels et al (2024) suggested that haylage did not alter the oral pH of saliva however this did not reflect the oral microbiome. Therefore, this study aimed to investigate the prevalence of peripheral caries in horses and to compare the occurrence of this issue between horses fed hay or haylage.

Materials & Method: An observational study approved by Hartpury Ethics Committee (ETHICS2025-339-LR) was conducted with a sample size of 30 domestic horses from several yards. Horses included in the study were over five years of age and underwent routine oral examinations carried out by a qualified British Association of Equine Dental Technicians (BAEDT) equine dentist. The severity of peripheral caries was graded on a scale from 0 – 3, where grade 0 represented no visible caries and grades 1 – 3 represented increasing severity of caries. Horses were grouped according to their primary forage diet, either hay or haylage (n=15/diet), based on information provided by owners or yard managers. Additional information such as age, sex and grazing hours were also recorded as available. Chi–square was used to analyse to determine the prevalence of peripheral caries within each forage group. Comparisons were made between horses fed hay and haylage to assess any differences in the occurrence of the condition.

Results: Peripheral caries was present in 19 (63.3%) out of the 30 horses used, 7 (36.84%) of the 19 horses were on a hay diet and the remaining 12 (73.25%) were on a haylage diet. 86.6% had peripheral caries with a graded severity of either 0 or 1 on a hay-based diet, 13.3% presented peripheral caries with a graded severity of either 2 or 3 in comparison to the horses fed haylage, 40% of the horses were graded with a severity of either 0 or 1 and 60% of the horses fed haylage had present peripheral caries with a severity of either 2 or 3. Additional findings were that peripheral caries were more present in mares than geldings (8.6, $p = 0.03$).

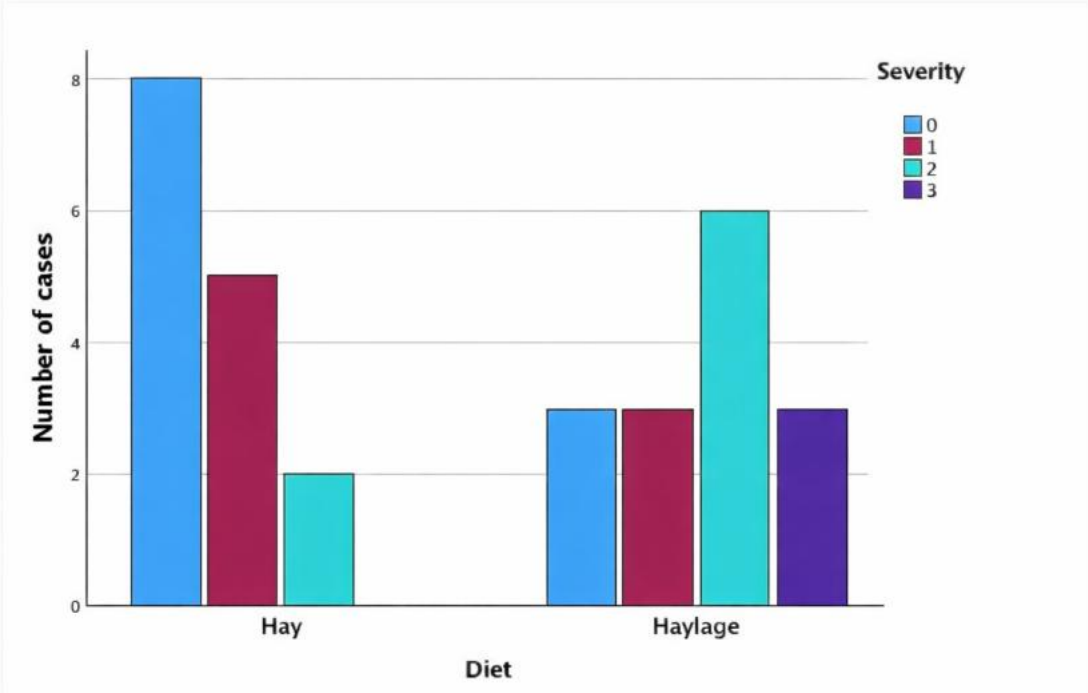

Figure 1: Distribution of peripheral caries severity in horses fed hay and haylage

Discussion & Conclusion: Peripheral caries is a common issue in the equid and maybe linked to dietary factors. In alignment with Borkent et al. (2016), who stated that horses fed haylage and hay could not be identified as a definite cause of peripheral caries however the understanding of the potential impacts of forage type on equine dental health may assist veterinarians, qualified dentists, and horse owners in making informed decisions aimed at reducing the risk of dental diseases. However, this study was limited by a relatively small sample size due to time constraints; with more time, a larger sample and further investigation into variables such as breed, and sex would be beneficial.

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An investigation into common feeding myths and practices used by horse owners in the UK

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Keywords: equine; nutrition

Introduction: Horse owners' nutritional knowledge is vital to ensure their horses' welfare and reduce the risk of nutrition related disorders (Nichols *et al.,* 2022). However, anecdotal evidence suggests that feeding practices vary amongst horse owners, often still basing their feeding decisions on traditional practices and misinformation (O'Connor, 2025). Therefore, the aim of this study was to investigate common myths and traditional practises in feeding horses in the UK.

Materials and methods: A cross-sectional online questionnaire was created in MS Forms and included multiple choice and Likert scale questions to produce non-parametric quantitative data. Questions focused on demographic information and statements relating to different feeding practices and feeding myths which had been anecdotally reported in industry. Following ethical approval by Hartpury University (ETHICS2025-161-LR) and pilot study, the questionnaire was shared across social media sites for 5 weeks aimed at horse owners in the UK. A Kruskal-Wallis test was used to allow for comparisons between education level, age, and years of experience.

Results: Out of 528 valid responses, 95.5% (n=506) demonstrated strong understanding on the importance of fibre within the horse's diet. However, only 22.7% (n=120) of respondents identified that more haylage should be provided on an as fed basis when moisture content was high, which was found to differ significantly ($P<0.01$) between years of experience as well as between levels of education ($P<0.01$). With regards to complementary bucket feeds, the majority of respondents (81.5%, n=430) understood the importance of balancers within the horse's diet, and felt that concentrate feeds did not provide quick release energy (76.2%, n=402). However, 63.6% (n=335) of respondents believed that molasses increased the risk of laminitis and EMS, whereby respondents aged 18 – 40 years old were significantly ($P<0.05$) more likely to hold this believe. Whilst 53.8% (n=284) of respondents fed supplements to provide a balanced diet, only 46.2% (n=243) knew exactly what supplements their horse needed. Interestingly, 61% (n=322) believed that horses have nutritional wisdom to regulate nutrient intake. This was not found to differ between education level, years of experience or age groups ($P>0.05$). Mixed responses were received around feeding before and after exercise in relation to increasing risk of colic, whereby significant differences were found between years of experience ($P<0.05$).

Discussion &Conclusions: It was of interest to note that inexperienced owners (≤5 years experience) were more likely to show uncertainty. This is consistent with literature surrounding knowledge gaps (Mastellar *et al.,* 2018). Higher education equating to accuracy may be due to better critical thinking skills and more access to scientific resources. Brands claiming supplement benefits could also explain conflicting views on supplements. This study demonstrates how future research could investigate the impact of both horse demographics on feeding choices and owners' preferred information sources. Additionally, the study highlights how the equine industry would benefit from demographically targeted, evidence-based, easily accessible information sources. This

would help to disregard myths and inaccurate traditional feeding practices, in turn improving equine welfare and nutrition across the UK.

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Is rugging stressful? A Preliminary Study of Behavioural and Physiological Stress Responses during Equine Rugging

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Keywords: Arousal, habituation, equine stress, equine welfare

Introduction: Rugging is a common equine management method for thermoregulation, coat protection, and comfort, but choices are often rooted in tradition and owner opinions rather than scientific evidence, raising welfare concerns. Inappropriate rug use, particularly in mild conditions, may interfere with natural thermoregulatory processes and contribute to discomfort or overheating. Horses possess physiological and behavioural mechanisms to regulate body temperature, including vasoconstriction, piloerection, and behavioural adaptations such as posture changes and shelter-seeking (Mejdell et al., 2020). The study aimed to evaluate the behavioural and physiological responses of horses to routine rugging and assess its impact on welfare.

Materials & Method: This study combined behavioural and physiological methods to evaluate rugging's effects. Sixteen college horses (eight mares, eight geldings) habituated to routine rugging were observed individually in their stables. Habituation ensured that responses reflected normal management conditions rather than novelty-induced stress. Horses were desensitised to equipment, including heart rate monitor and video camera, prior to data collection. A focal sampling method was used: each observation lasted 11 minutes—five before rugging, one during rug application, and five after. An ethogram recorded frequency of movement, resting, pawing, tail swishing, and head tossing. Heart rate and blink rate were used as indicators of stress and arousal. Paired T Test and Wilcoxon signed rank statistical tests were used following an Anderson Darling test, to analyse whether rugging caused significant changes in the measured variables.

Results: Behavioural observations showed minimal change following rug application. Neutral behaviours such as standing and resting before and after rugging reflected typical activity. Discomfort behaviours were observed before and after rugging with tail swishes increasing by 6 occurrences after rugging, pawing reducing by 1 and head tosses increasing by 2 (figure 1).

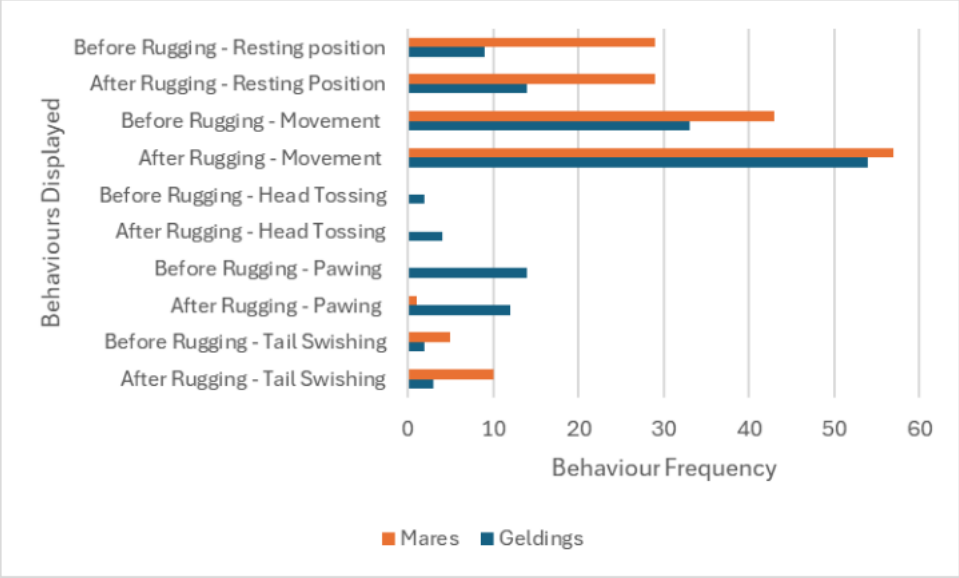

Figure 1: Horse behaviour before and after rugging.

Statistical analysis revealed no significant differences in behavioural responses or between sexes ($p > 0.05$), indicating consistent responses across individuals. Physiological findings demonstrated a significant increase in blink frequency following rug application (<0.05), with both full and half blinks increasing once the rug was on. Higher blink rates indicate lower vigilance and greater relaxation (Mott et al., 2020), while heart rate remained unchanged, showing no acute stress from rugging. Eye twitch frequency remained unchanged, further supporting the absence of physiological stress.

Discussion & Conclusion: Rugging had minimal impact on both behavioural and physiological indicators of welfare in habituated horses. The increase in blink frequency indicates reduced vigilance rather than stress, supported by the absence of changes in heart rate. Habituation appears to be a key factor, as horses accustomed to rugging are likely desensitised to the process. Environmental factors also influenced the results. The stable setting restricted behavioural expression, and low insect activity may explain the limited occurrence of agitation behaviours, contributing to a calming effect (Daw et al., 2025). Minor physiological changes appear to reflect brief handling responses, not distress. Routine rugging does not harm horse welfare and may aid relaxation. The study was limited by a small sample size and use of only college horses.

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Comparing the therapeutic benefits of the Equilibrium Massage Pad to an Equine Massage Therapist

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Keywords: Welfare; Physiology; Behaviour; Relaxation

Introduction: Massage therapy is increasingly integrated into equine management, due to the need to manage the particularly high prevalence of equine musculoskeletal injuries (Thirkell and Hyland, 2017). Manual techniques delivered by qualified practitioners and mechanical devices are promoted to enhance relaxation and musculoskeletal function. However, empirical comparisons of these modalities remain scarce, restricting evidence-based recommendations for equine welfare and performance. This study compared short-term physiological and behavioural responses of horses to mechanical and manual massage.

Materials & Methods: Ten horses (eight mares, two geldings; 7-21 years, 13.1±4.3 yrs; 145 cm - 168 cm, 162.8±6.2 cm) participated in a cross-over repeated measures design with a one-week washout. Each horse received a 30-minute session with both the Equilibrium massage pad (condition 1) and a qualified therapist (condition 2). Heart rate (HR) was recorded using a Polar Equine H10 sensor, and facial videography captured behavioural indicators of relaxation, later analysed by an independent equine behavioural researcher blinded to experimental conditions, using the EquiFACS ethogram (Wathan et al, 2015). Repeated measures ANOVA assessed HR differences, with age included as a covariate, while a Wilcoxon signed-rank test (post-hoc to a significant Friedman test) examined differences in relaxation behaviours. Significance was set at $p \leq 0.05$.

Results: The effect of time on HR was significant in both conditions ($p = 0.05$), indicating progressive physiological change during treatment, but no main effect of condition ($p = 0.78$) or time x condition ($p = 0.59$). Including age as a covariate revealed a significant condition x age interaction ($p = 0.04$) and time x age interaction ($p = 0.02$), suggesting individual characteristics may influence responsiveness. Behavioural analysis indicated no significant differences between treatments ($p > 0.05$).

Table 1. Descriptive statistics (mean ± SD) of HR for all horses (n = 10) across both conditions.

Specific time points during treatment	**Massage Pad (Condition 1)** Mean HR ± standard deviation (bpm)	**Massage Therapist (Condition 2)** Mean HR ± standard deviation (bpm)
Starting HR	49 ± 21.6	54 ± 26.8
0-5 minutes	42 ± 11.6	41 ± 11.8
5-10 minutes	37 ± 4.0	37 ± 5.0
10-15 minutes	38 ± 5.3	36 ± 4.3
15-20 minutes	38 ± 4.7	38 ± 5.2
20-25 minutes	38 ± 4.7	36 ± 3.8
25-30 minutes	37 ± 5.0	36 ± 3.5
Ending HR	38 ± 5.7	35 ± 3.9

Discussion & Conclusion: Both mechanical and manual massage elicited comparable immediate physiological responses overall. Significance with age as a covariate suggests that physiological responsiveness to types of massage is not uniform and may be influenced by age-related autonomic or musculoskeletal factors. The two youngest horses (seven yrs) had HR increases in both conditions, an average of 10.3% increase (condition 1) and 9.1% increase (condition 2). The oldest horse (twenty-one yrs) had a HR decrease of 34.4% (condition 1) and a 47.3% decrease (condition 2). However, this did not correspond with relaxation behaviour frequencies, with the youngest horses showing a higher number of positive behavioural indicators. This potential dissociation between physiological and behavioural indicators highlights the complexity and multidimensional nature of relaxation. The lack of behavioural differentiation may suggest that objective physiological measures may be more sensitive to detecting significant differences in response to the interventions. This lack of sensitivity is important to note, since most owners and therapists have access to behavioural indicators only on a daily basis. These findings cautiously support the practical use of both modalities, while emphasising that individual factors such as age should be considered when evaluating therapeutic outcomes.

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Perceptions and lived experiences of mental health among equestrians

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Keywords: occupational stress, stigma, wellbeing

Introduction: Mental health is an increasingly recognised concern across many sectors however, the equestrian industry is still relatively under researched despite presenting unique occupational, financial, and cultural pressures. Equestrians may experience performance expectations, demanding workloads and financial strain, alongside cultural norms emphasising resilience and independence (Tooby, 2021). The aim of this study was to explore the mental health challenges experienced within the equestrian community and examine factors influencing wellbeing and help seeking.

Materials & Methods: A qualitative research design was used to explore lived experiences of mental health in the equestrian community. Eight UK equestrians were recruited through social media and existing contacts. Participants were over 18 years of age and actively involved in horse ownership/the equine industry. Data were collected through online semi-structured interviews, discussing participants' perceptions of mental health, stigma, and workplace experienced within the equestrian community. Interviews were audio recorded, transcribed verbatim and analysed using thematic analysis following a six-phase approach (Clarke and Braun, 2017).

Results: Three key themes were identified; occupational pressures, emotional and physical impact, and barriers to support. Occupational pressures included financial strain, performance pressure, and negative employer experiences. Participants also described positive aspects of equestrian involvement, including social belonging and emotional regulation through riding. However, stigma surrounding mental health, demanding schedules, and limited awareness of equestrian specific support systems were identified as barriers to accessing support.

Discussion & Conclusion: These findings highlight the complex relationship between equestrian participation and mental wellbeing. Improving mental health awareness, equine workplace practices, and access to equestrian specific support services may help to reduce stigma and improve wellbeing within the equine industry.

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Perceptions of retired racehorses for second-career opportunities in the United Kingdom (UK) Equine Industry

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Keywords: equine rehoming; welfare; retraining; RoR

Introduction: This study explored equestrian perceptions of retired thoroughbreds and how this effects likelihood of considering adoption. Each year an estimate of 7,000 (HorsePwr, 2025) thoroughbreds retire from racing and must find a new home, whether that be leisure riding, competition, companion homes or be euthanised. While many thoroughbreds adapt successfully to post racing careers, adoption rates can be influenced by perceptions within the equestrian community regarding the breed's temperament, retraining difficulty and suitability for amateur riders (Neveux *et al*., 2014). Negative perceptions may discourage potential adopters. Understanding the factors that shape perceptions about thoroughbreds is essential to enhance rehoming success and ensure better welfare outcomes for retired racehorses.

Materials & Methods: A questionnaire containing 14 questions was posted in Facebook groups to examine experience of thoroughbreds, motivations for ownership, barriers to adoption and perceptions surrounding the breed. Reponses were collected from participants involved in the equestrian industry (n = 662). Quantitative data were analysed descriptively, while qualitative responses were examined using a thematic analysis to identify commonly held perceptions of retired thoroughbred racehorses.

Results: The majority of participants (77%; *n* = 513) had substantial equestrian experience and prior exposure to thoroughbreds. Affordability and athletic potential were the most common motivations for obtaining a retired racehorse. However, the most common barrier appeared to be lack of retraining confidence and concerns about suitability for amateur riders. The qualitative findings highlighted key themes like safeguarding, appropriate home placement, education and retraining support. Participants commonly emphasised concerns around retired thoroughbreds being placed in inexperienced homes and the need for greater transparency during the rehoming process.

Discussion & Conclusions: Likelihood to rehome a retired thoroughbred racehorse was influenced more by the perceived risk, confidence in retraining ability and trust in the rehoming system more than the negative perceptions around the breed itself. Importantly, these perceptions may not be unfounded, as some retired Thoroughbreds can present behavioural or physical challenges associated with their racing background, such as difficulty adapting to new routines or pre-existing musculoskeletal injuries that require careful management. These findings will help to contribute to the current understanding of thoroughbred rehoming by identifying practical factors that shape adoption decisions within the equestrian community. For industry stakeholders, the results suggest that improving education, increasing the transparency during the rehoming process and promoting positive retraining outcomes may help to strengthen confidence among potential adopters and ultimately support higher and more sustainable adoption rates of retired racehorses.

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Do Stallions Significantly Affect Their Progeny's Sales and Racing Performance

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Keywords: Racing Performance; Stallion; Breeding; Yearling Valuation

Introduction: The British Thoroughbred industry operates within a class-conscious stud-fee system, where stallion fees and yearling prices are assumed to reflect progeny racing success and quality. However, variation in racing and commercial outcomes exists within individual fee brackets. Previous research has identified the links between biological factors like birth date, racing performance and purchase price, but the predictive strength remains conflicting (Carlos Arango-Sabogal *et al.*, 2022). Further analysis of economics highlights the role of the market structure and stallion pricing strategies (Losey and Lambert, 2020). While longer studies identify variation in the consideration of early race performance (More, 1999). This study aimed to evaluate the relationship between the yearling sale prices and the early racing performance in progeny of midmarket stallions.

Materials & Methods: The data set included 13 British-based stallions within the midmarket fee bracket (£10,000-£15,000), with publicly available 2023 yearling sales data and the single 2024 maiden-season racing data for their progeny, in which the KPI's of Prize money, Racing Post Rating, starts, and wins were collected. Data for 200 Colts were collected, with Colts only being used to eliminate gender bias in performance. Normality was assessed using the Kolmogorov-Smirnov Test, and due to the skewness of the data, non-parametric methods were used, including the Spearman's rank order test to examine the relationship between the variables and the Kruskal-Wallis test to examine the differences between the variables.

Results: Significant differences in yearling sales prices were identified across the stallion cohort in the fee bracket ($p=0.0001$), confirming that stallion identity influences commercial value, although no individual pairwise differences remain significant after applying a Dunn's post-hoc with Holm's correction ($p>0.05$). Strong positive correlations were identified between core racing KPI's, particularly between Racing Post Rating and Prize Money ($rho=0.820$, $p<0.001$) (Figure 1), showing the consistency in performance internally. However, the association between sales price and maiden-season performance was positive but weak; there was a weak positive relationship with prize money ($rho=0.234$, $p=0.001$), indicating that although statistically significant, the association is not strong enough to be considered meaningful. No significant relationship with wins was found ($p>0.05$), reaffirming the limited value of predictability in sales price.

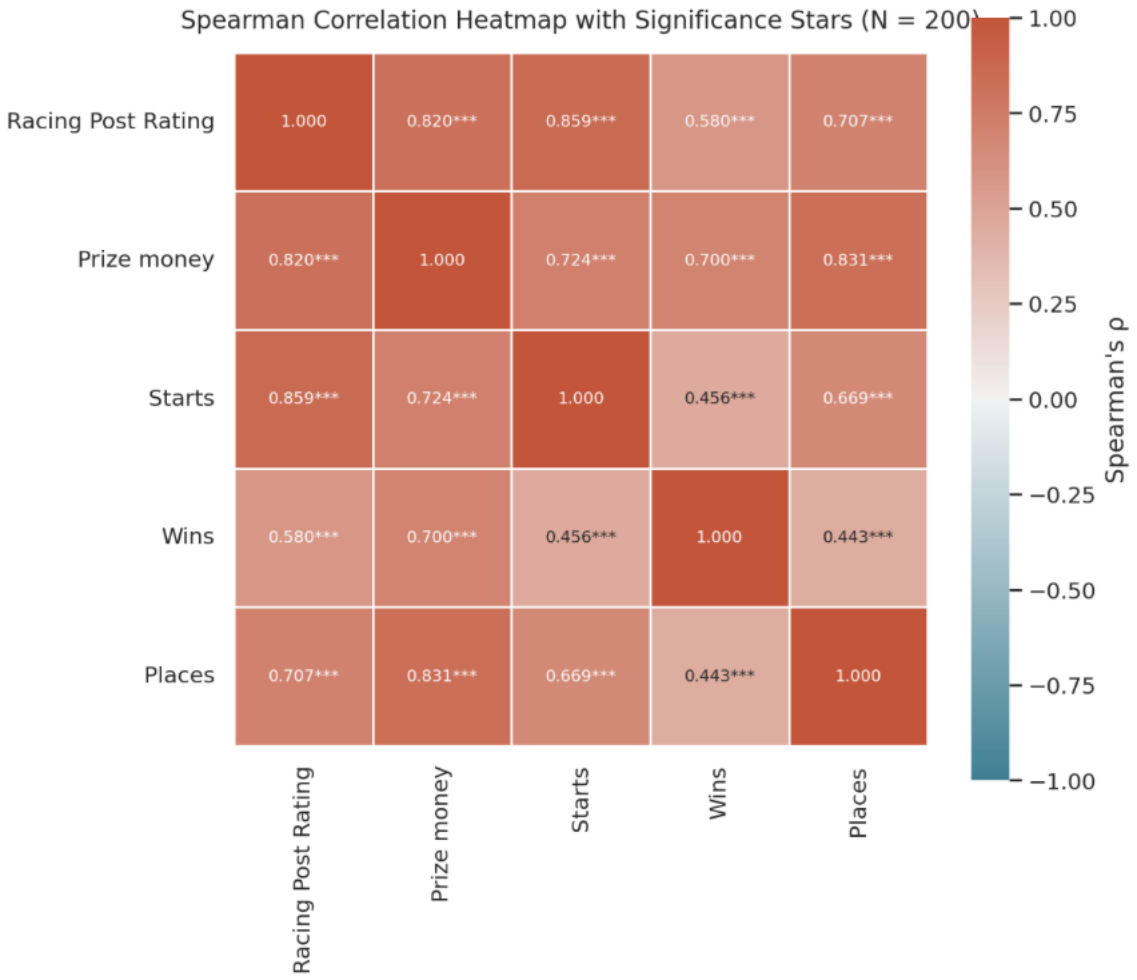

Figure 1: Spearman's Rho Heat Map (created using AI)

Discussion & Conclusions: While stallion identification significantly impacts commercial value, sales price alone is not a strong predictor for maiden season success. Early racing performance appears to be multifactual including genetics and the external influences of trainers, ownership and athletic ability. This reinforces the complex nature of performance outcomes and highlights the limitations of relying solely on economic indicators, especially when assessing progeny's future success.

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The effect of physiotherapy on stress-related behaviours in stabled horses: a comparative observational study

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Keywords: equine welfare; behaviour; physiotherapy; stress

Introduction: Equine welfare is a key concern within the equine industry, particularly relating to stabling practices that restrict natural behaviours such as movement, socialising and grazing. These restrictions are associated with increased stress-related behaviours and stereotypies, indicating poor welfare (Lesimple, 2020). Whilst environmental modifications such as increased turnout and enrichment have been widely studied, the potential impact of physical discomfort and physiotherapy remains understudied. Musculoskeletal discomfort has been suggested as a possible contributing factor to behavioural expression (Dyson and Pollard, 2020), but limited research has explored whether physiotherapy can reduce stress-related behaviours in stabled horses. Therefore, this study aimed to determine whether regular physiotherapy is associated with reductions in stress related behaviours compared to behavioural changes attributed to environmental habituation.

Materials & Methods: A total of 80 horses were included in the study, comprising newly arrived (n=35), long-term residents (n=36), and physiotherapy-treated horses (n=9). The physiotherapy group contained newly arrived horses receiving short-term treatment, with behavioural observations conducted on the same day as physiotherapy sessions. Behavioural observations were conducted over four consecutive weeks using a standardised ethogram to quantify the duration and frequency of seven stress-related behaviours. Observations were carried out within stable environments using structured observation schedules. Behavioural duration data was analysed using a mixed-design ANOVA to assess differences between groups and across weeks. Behavioural frequency data was analysed using Pearson's Chi-square tests. Comparisons were made to distinguish the effects of physiotherapy from habituation effects.

Results: Newly arrived horses displayed longer durations of several stress-related behaviours during early observation weeks, with some behaviours decreasing over time. Long-term horses showed relatively stable behavioural trends across the four weeks. Physiotherapy horses demonstrated variability in behavioural expression, but most behaviours were observed at lower frequencies or were completely absent in this group. Weight-shifting and ears-back posture showed notable variation across groups and weeks. A significant association between horse group and ears-back posture was seen in week 1 ($p = 0.044$). Pawing and head bobbing occurred at the lowest frequencies across all groups.

Discussion & Conclusions: The findings suggest that behavioural changes in stabled horses may be impacted by both habituation and management factors. While consistent reductions in stress-related behaviours were not observed across all measures, the reduction of most behaviours within the physiotherapy group may indicate potential welfare benefits. This may partially be explained by reduced musculoskeletal discomfort after treatment, as pain has been linked to behavioural expression in horses (Dyson and Pollard, 2020), or through relaxation related to manual therapies (Yavuzkan Paskoy et al., 2025). However, interpretation is limited by the small sample size and differences in management conditions between groups, such as variations in routine, handling and

stable environment. These findings show the complexity of interpreting equine behavioural responses and the importance of considering both physical and environmental factors when investigating welfare. Further research using larger sample sizes and controlled conditions is required to understand the extent to which physiotherapy impacts behavioural welfare.

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Equine Hock Kinematics Over Ridden vs Non-Ridden Trot Poles

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Keywords: rehabilitation; performance; controlled exercise

Introduction: Rehabilitation aims to recover the horses' systems to previous levels of function. Pole work is an accessible, kinematic controlled exercise that reestablishes and restores the horse's optimal movement pattern, by increasing joint active range of movement (AROM) without increasing ground reaction forces, preventing structure overloading (Walker et al, 2022). This research tested whether non-ridden or ridden ground trot poles caused a larger hock AROM or stride duration (SD), to identify if one could rehabilitate and strengthen the periarticular tissues in the hind end more effectively (Patterson-Kane & Firth, 2014).

Materials & Methods: Six riding school horses (mean ± s.d. age: 14.5 ±3.48 years, weight 565 ±28.758 and withers height: 16.3 ±0.529) took part. Horses were trotted over four 3x0.095m round wooden poles, placed 132cm apart in an indoor arena. Footage was filmed using an iPhone 15 attached to a 160cm tripod, 12 meters from the far side of poles along the arena's long side. Set-up measurements were obtained during a pilot study to ensure optimal framing. Each horse did four trials three times, right lead (RL), right ridden (RR), left lead (LL), left ridden (LR). Trials were retained when the horse trotted through the poles at a consistent rhythm and negotiated the poles cleanly without tripping. Each horse had three hemispherical five cm, 2.89g polystyrene markers either covered in black or white electrical tape, to produce the highest contrast, attached using double sided tape. Markers were placed on the lateral aspects of the patella, tuber calcis, and fetlock on both hind legs while the horse was standing square by the same person to ensure placement reliability, using adhesive tape as recommended by Quintic. Trail videos were input into Quintic software, markers were linked and tracked to record peak hock flexion and extension. Data were normally distributed except for rein stride duration (SD) comparison, therefore a series of Paired T tests and Wilcox test using R studio analysed if differences occurred between ridden and non-ridden or right and left rein (significance: $p<0.05$) using R studio.

Results: There was no significance between the horses' average ridden (RR, LR) AROM compared to non-ridden (RL, LL) AROM (P=0.75). There was also no significance between the average SD between ridden (RR, LR) and non-ridden (RL, LL) (P=0.61). There was no significance between both tests average left rein (LR, LL) and right rein (RR, RL) AROM (P=0.21), or when comparing stride duration (P=0.44).

Discussion & Conclusion: These results suggest that pole work during early rehabilitation can be done as effectively in-hand as ridden without the increased load and stress of rider weight. Despite the lack of overall significance there is some difference individually when comparing non-ridden and ridden AROM, which suggests some horses could have increased balanced or speed whilst ridden, or decreased when non-ridden. There was no control for speed or weight which could affect the horses' AROM and SD. The small sample size lowers result reliability and representation to the equine population, further research should use a larger sample size ideally more than 20.

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What are the factors influencing the adoption of marketing innovation in UK equestrian business?

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Keywords: Digital transformation; organisational culture; attitudinal patterns; equine industry

Introduction: Marketing innovation has become increasingly important across the sport and leisure industries, with growing recognition of its drivers in the broader literature. However, how these dynamics operate within the UK equestrian business context remains unclear. With an emphasis placed on organisational conditions, characteristics specific to the sector and attitudinal patterns as drivers of decision-making, this study aims to investigate the factors that influence the adoption and use of marketing innovation in this environment.

Materials & Methods: A predominantly quantitative research design, complemented by qualitative insights was implemented using a cross-sectional online questionnaire, which was distributed to equestrian marketing-related professionals. Descriptive statistics were used to identify general trends, while chi-square test of independence and Cramérs' V examined relationships and strengths between organisational and demographic associations. Exploratory cluster analysis was further used to identify underlying attitudinal profiles and open-ended responses brought context through combined inductive and deductive analytical approaches (Braun and Clarke, 2006; Aronson, 1995).

Results: With a sample of n=68, uptake was more prevalent in more accessible lower-risk channels, where higher levels of adoption were observed in social media (77.9%) and email marketing (64.7%), whereas more resource-intensive practices, including paid online advertisement, showed the lowest uptake with 27.9% reporting non-adoption. 79.4% of respondents characterised sector innovation adoption as moderate or slight. No statistically significant associations were identified, suggesting a homogeneous pattern across the sample. Cluster analysis, however, detected distinguished attitudinal profiles among organisations, separating them into innovation-driven and tradition-constrained. Thematic analysis also revealed recurrent themes related to structural resource disparities, digital modernisation and measurement and evidence supporting innovation decisions.

Discussion & Conclusion: Collectively, findings indicate that marketing innovation seems to be conditionally and selectively adopted within UK equestrian businesses, with adoption patterns pointing to organisational capacity, perceived feasibility and alignment with established practices being considered when evaluating innovation. Overall, adoption was shown to be resource-dependent and culturally-mediated patterns, with propensity for implementation being influenced by compatibility with established norms and reputational expectations. Instead of appearing as a purely strategic choice, innovation was demonstrated as a negotiated process that requires alignment between organisational capabilities and sector-specific values. To determine whether these patterns remain relevant in larger samples, further research is required.

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Trends and variability in UK hay and haylage quality: a multi-year NIRS dataset analysis

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Keywords: Feeding; Forage analysis; Nutrition

Introduction: Horses have evolved to consume high fibre, forage-based diets, with a minimum forage requirement of 1.5% body weight in dry matter/day. Hindgut microbial fermentation breaks down fibre into volatile fatty acids (VFAs), a key energy source (Wunderlich *et al.*, 2023). Adequate forage supports gut health, mobility, and microbial diversity, while increased chewing stimulates saliva production (Müller and Udén, 2007). Assessing forage quality using forage analysis facilitates horse owners and carers to make an informed choice on forage suitability and with this, the potential to optimise wider health and welfare outcomes.

Materials & Methods: A multi-year data set containing six years (hay n=251 and haylage n=124) of forage analyses data were obtained from Saracen Horse Feeds 2019-2025 (excluding 2020). All client information was removed and anonymised prior to the dataset being received to comply with General Data Protection Regulations (GDPR) This study was approved by Anglia Ruskin University ethics committee number ETH2526-1414. The dataset was then cleaned of international data and outliers, the latter represented measurement errors. The Shapiro-Wilk test was used to determine if the data were parametric ($p \geq 0.05$) or non-parametric ($p < 0.05$). The data was non- parametric thus a Kruskal-Wallis with post- hoc analysis was employed to compare forage quality and metrics across multiple years. Spearman's rank was used to assess presence of a relationship between forage parameters. Statistical tests explored trends and variability in forage nutrients (Acid Detergent Fibre, Crude Protein, Digestible Energy, Dry Matter and Neutral Detergent Fibre). The data were negatively skewed.

Results: Data analysis was completed separately for hay and haylage. There was a significant decrease in ADF, CP and DE and a significant increase in NDF, however DM showed no significance in both forage types. For example, CP decreased over time, from 10.7% in 2019 to 8.7% in 2024 and 2025. Post hoc analysis indicated that CP was significantly lower in 2022 ($p = 0.018$), 2024 ($p = 0.016$), and 2025 ($p = 0.010$) compared to 2019.

Discussion & Conclusion: CP significantly decreased across years, likely reflecting the influence of environmental conditions during growth and harvest, with warmer climates associated with reduced protein content and increased fibre accumulation (Li et al., 2024). While some variation in CP may not directly translate to proportional changes in digestible protein, this variability introduces uncertainty into forage nutritional value and may affect ration formulation if not accounted for. These findings highlight the importance of routine forage analysis to support evidence-based ration formulation and optimise equine health and performance.

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Patting or Scratching? A Realist Evaluation of Horse–Human Touch Interactions in an Educational Setting

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Keywords: horse-human interactions, species-specific behaviour, equicentric, realist evaluation

Introduction: Horse–human interactions are central to equine welfare, particularly within educational settings where horses are used to support student learning. However, common practices within these interactions may reflect human habit rather than the biological and affective needs of the horse. This study applied a realist evaluation framework to investigate how, why, and for whom horse–human touch interactions occur, with a specific focus on the use of patting versus scratching as consequences following horse behaviour.

Materials & Methods: An initial program theory was developed using "if–then–because" statements: if students are equipped with knowledge of equine learning theory and species-specific behaviour, then they are more likely to use scratching rather than patting, because scratching aligns with allogrooming behaviour and is more likely to promote positive affective states in the horse. Conversely, patting is hypothesised to persist where student behaviour is shaped by cultural norms and anthropomorphic assumptions. Data were collected over a two-week period at Hartpury University, observing five horses and twelve students across ridden and in-hand sessions. Horse behaviour was recorded using an ethogram, alongside contextual factors including coach instruction, session type, and prior learning history. A reflective diary was used to capture the perceived purpose and timing of each touch interaction.

Results: Findings indicated substantial variation in the frequency and type of touch interactions, with patting occurring more frequently than scratching across sessions. With one of the key findings being that the frequency of touch interactions during session varied from 4 to 43. Touch interactions also appeared to function as 'comfort behaviours' for the rider rather than as contingent consequences for the horse. Indicators of positive affect were observed following both interaction types; however, behaviours associated with relaxation and equine cognition were more consistently linked to scratching when applied to preferred areas. Coach instruction and student experience emerged as key contextual factors influencing interaction choice.

Discussion & Conclusions: These findings refine the initial programme theory by demonstrating that educational context, student knowledge, and cultural norms interact to shape horse–human interactions, with implications for both equine welfare and student learning. The study highlights the need for explicit integration of learning theory and species-specific behaviour within equestrian education to support more equicentric practices.

A case study analysis of the impact of pop-up events on the growth and development of small businesses

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Keywords: SME; marketing; ephemeral stores

Introduction: The aim of this study was to identify whether pop-up events can support the growth and development of small-medium enterprises (SMEs) in terms of profit, revenue and brand awareness. Pop-up events consist of a temporary store at a specific location or venue which operates alongside their website and stockists. Literature has neglected deeper research in this topic area due to their recent growth. The existing literature states pop-ups can achieve these goals but there is limited use of case studies to test the effectiveness of the theory. SMEs are a key driver of economic growth and job creation that require strategies to support continued operation to avoid failure (European Commission, 2020).

Materials & Methods: A case study approach was taken using a SMEs retrospective data of their sales, website traffic, online orders and email subscribers before and after their pop-up events from February to October 2025, analysing their impact on the business. The pop-up events they attend are focused on equestrian competition, country fairs or music and food festivals. The data was ordered using a top-bottom approach to analyse the most significant data using descriptive statistics to state means and percentages which enabled identification of the most successful pop up events (IBM, 2025).

Results: Pop-ups were found to provide a key channel of sales making up 27.5% of their 2025 revenue and increasing online orders up to 115%. The pop-up events attended were labelled either equestrian, country or festival. The equestrian events were seen to generate high profits, the country and festival events supported brand awareness. Results indicated that SMEs could increase brand awareness through increased website sessions (up to 35%) and email subscribers (up to 1.58%). Event Equine 5 was successful at increasing all measured variables and therefore highlighted a key event the business should focus their resources on.

Discussion & Conclusion: Within country and equestrian markets, factors such as footfall and the consumer persona, impact the profitability and brand performance at pop-up events. This demonstrated the importance of being present in multiple markets. The most profitable pop-ups, typically equine events with a high footfall, did not always support the brand awareness of the SME compared to the lesser profit generating events. As a result of the data analysed, customer service alongside marketing strategies can influence the brand awareness, loyalty and profits at pop-up events while reducing the risk of showrooming. A marketing plan was formed around the events the SME should attend which incorporated the use of a resource-based framework and organisational performance to maximise profits and brand awareness at each pop-up (Sipos et al., 2025). This marketing plan can be adapted for other SMEs, supporting their growth and development in increasing business size and competitiveness within their respective market.

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Stakeholder Perceptions of Equine Training and Behaviourist Roles

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Keywords: Equine instructor, equine behaviour, education, qualification

Introduction: The regulation of equine practitioner roles is consistently debated by industry stakeholders, compounded by a lack of regulation. "Trainer," "instructor," and "behaviourist" are often used interchangeably despite having different responsibilities (Palmquist et al., 2025). The Animal Behaviour and Training Council (ABTC) provides standardised definitions: Animal Trainers (AT) teach skills directly to animals; Animal Training Instructors (ATI) teach owners how to train their animals; and Clinical Animal Behaviourists (CAB) diagnose and treat behaviour problems. Research in the canine industry found owners frequently consulted trainers rather than behaviourists for complex issues (Daniels et al., 2022). No equivalent equine research exists. Therefore, the main aim was to identify stakeholder search methods and expectations of practitioners, to help develop accreditation pathways that align with industry needs and standards (Campbell-Horne et al., 2026).

Materials & Methods: A Microsoft Forms survey was distributed through social media groups, comprising 39 questions (Likert scales, multiple-choice, and open text), exploring perceptions and experiences of practitioner roles within the industry. Open-text responses were analysed using Braun and Clarke's thematic analysis, comparing role perceptions against ABTC definitions.

Results: Fifteen respondents (13 female, 2 male), aged 18-55+, all had 10+ years' equine experience. Over half (53%) worked in the industry, including grooms (40%), coaches (40%), producing/training (30%), and behaviour/rehabilitation (20%). Participant definitions varied in alignment with ABTC standards. Trainers were predominantly (40%) incorrectly defined as training both horse and owner, confused with an ATI, which 33% could not describe. 80% of CAB's descriptions matched with ABTC standards, 47% expecting accreditation and degree-level qualifications. The most influential selection factor was training methods (93%). Word-of-mouth was the most common search method (67%-73%). 60% of participants used social media to observe trainer's methods. Behaviourists presented the greatest difficulty to find. Respondents attributed this to unregulated titles, despite ABTC registers. Riding coaches and trainers were described as abundant but variable in quality.

Discussion & Conclusions: This study revealed experienced stakeholders can distinguish between practitioners, yet training instructor roles remain poorly understood, and conflated with ATI's, suggesting ABTC role standardisation has not yet translated to public understanding. However, the alignment of perception of CAB's with ABTC standards indicate clinical roles may be more clearly recognised, likely due to professional registers and veterinary collaboration. Prioritisation of training methods (93%) over formal qualifications suggests owners seek professionals who align with their values, particularly positive reinforcement. Word-of-mouth as the dominant search method, and continued perception of behaviourists as unregulated suggests insufficient awareness of accreditation registers, mirroring findings in canine sectors (Daniels et al., 2022). Differences in

search patterns may inform practitioner's marketing priorities. Current qualifications do not meet every stakeholder's requirement, so developing transparent, ethical accreditation, may better fulfil public and practitioner's expectations (Campbell-Horne et al., 2026; Palmquist et al., 2025). Improved awareness of ABTC registers could address the unregulated use of titles. However, limitations including a small sample size (n=15), over-representation of female participants and all respondents had 10+ years' experience, limit this study's generalisability, especially to novice owners. Future research should explore whether expectations differ across experience levels.

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Coaches' perceptions of strength and conditioning for equestrian performance and injury prevention.

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Keywords: behaviour; interdisciplinary; motivation; coach education

Introduction: Equestrian sport requires riders to possess physical strength and cardiovascular endurance to optimise horse-rider performance and reduce injury risk (Best, Williams and Pearce, 2023). However traditional equestrian coaching practices may limit the integration of strength and conditioning (S&C) compared to other sports. This may reduce rider preparedness and increase injury risk. The aim of this research was to compare how equine and S&C coaches value S&C for rider performance and injury prevention and identify factors influencing its adoption.

Materials & Methods: Eight qualified equine (n=3) and S&C coaches (n=5) currently coaching in the UK were interviewed via Microsoft Teams. Semi-structured interviews explored their coaching philosophy, athlete planning and perceived barriers to S&C adoption, interdisciplinary relationships and views on the future of equestrian sport. Data were analysed using reflexive thematic analysis (Braun and Clarke, 2007).

Results: Thematic analysis identified three main themes which included: 1. Riders prioritised horse related expenditure over personal physical development, limiting engagement with S&C. 2. Coaches (equestrian) reported limited knowledge of S&C and perceived it as unnecessary or potentially detrimental to riding performance. 3. Traditional practices within equestrian sport influences coaching beliefs and reduced interdisciplinary collaboration between equestrian and S&C coaches.

Discussion & Conclusion: Low adoption of S&C training programmes for riders appears influenced by traditional equestrian coaching beliefs, limited coach education and financial prioritisation towards horses. These findings highlight the need for improved interdisciplinary connection and targeted education for equestrian coaches. Increasing awareness of S&C benefits may enhance rider performance, reduce injury risk and support long-term athlete development in equestrian sports (Berglund et al. 2023).

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Equine Neonatal Sepsis: The Ability of U.K. Equestrians to Identify Healthy Neonatal Foal Parameters and Confidence in Recognising Clinical Signs.

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Keywords: Antibiotics; Diagnosis; Late treatment.

Introduction: Equine Neonatal Sepsis (ENS) is the leading cause of mortality in foals <1 week old, with reported fatality rates of up to 60% worldwide (Eaton, 2023). It arises due to the body's dysregulated response to infection, resulting in single or multiple organ dysfunction. Most often the cause is failure of passive transfer. Though clinical signs can present, these are widely reported to be subtle and non-specific, meaning that they can be difficult to identify and associate with sepsis (Wattal *et al*., 2020). Consequently, diagnosis is often achieved late when infection severity has developed, meaning treatment is less effective and likelihood of a positive prognosis reduced. To investigate the ability of equestrians to identify healthy neonatal foal parameters and identify their confidence in recognising typical clinical signs of sepsis. Ultimately, these data will support the development of a more rapid method of diagnosis to ensure earlier intervention.

Materials & Methods: A structured questionnaire with open and closed questions was created in Microsoft Forms and shared via equestrian Facebook groups (Jan–Mar 2025). It assessed equestrians' ability to identify healthy neonatal foal parameters and recognise ENS signs. Of 481 responses, 470 were analysed. Questions 4–11 covered demographics; 12–19 knowledge; 20a–i confidence. Nominal data used Chi-square; ordinal used Kruskal–Wallis and Mann–Whitney U (SPSS). Parameters included sleep, nursing, mucous membranes, heart/respiratory rates, demeanour, and temperature; signs included abnormal values and behaviours.

Results: Statistical analysis showed ages 18–24 gave significantly more undetailed correct answers for demeanour ($p=0.002$), with no other age differences after correction ($p=0.044$–0.727). Greater neonatal foal experience improved accuracy for nursing frequency ($p=0.016$), resting HR ($p=0.002$), and blood pressure ($p=0.005$), with 11–30 years performing best and no experience linked to incorrect answers. General equine experience was not significant ($p=0.079$–0.981), nor ENS experience except for nursing frequency ($p<0.001$). Stud experience improved rectal temperature accuracy ($p<0.001$). Academic level showed no effect ($p=0.083$–0.817), but equine-specific qualifications influenced sleep ($p=0.013$) and nursing frequency ($p=0.027$). Confidence varied significantly by age, experience, and qualifications ($p\leq0.005$). Demeanour was most accurately identified (47–100%), while mucous membranes (0–8%), were poorest.

Discussion & Conclusions: Previous research highlights that early diagnosis is imperative to foal survival, and this study provides evidence of inability of many equestrian groups to recognise foal healthy parameters and overestimated confidence in recognising ENS clinical signs. This may explain why diagnosis is achieved late and mortality rates are high.

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A practicable approach to equine welfare and sustainability: Evaluating nocturnal rest behaviour and bedding management in stabled horses

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Keywords: Recumbency; Waste; stable-management; Bedding-Type.

Introduction: Bedding management is important for equine welfare and environmental sustainability in stabled systems. Bedding type has been shown to influence resting behaviour, respiratory health and stable air quality, where straw-based bedding is linked to increased lying duration (Greening et al., 2013), wood-based materials reduce dust exposure (Kwiatkowska-Stenzel et al., 2017), and beds >10cm are associated with greater recumbency (Greening et al., 2021). However, limited research has examined how bedding type and depth together affect resting behaviour and waste output. This study aimed to investigate these effects in stabled horses under real-world conditions.

Materials & Methods: An observational study conducted at a UK livery yard employed a convenience sample of 20 healthy stabled horses, managed under their usual routine conditions, with exclusion criteria of no stereotypic behaviours. Duration of behavioural states (lateral and sternal recumbency, standing rest and alert, and head-over-door) were recorded via continuous focal observations over four consecutive nights from 19:00 to 07:00 using iZEEKER wildlife cameras, and analysed retrospectively. A novel method of measuring bedding depth was employed daily. Waste output was reported by owners as the number of wheelbarrow loads removed per day. Relationships between behaviour, age, height, bedding type, bedding depth and waste output were analysed using Linear Mixed Models. A Mann–Whitney U test compared waste and bedding types. Statistical significance was set at $p \leq 0.05$.

Results: Horses on straw bedding spent 21 minutes more time in lateral recumbency than those on shavings ($\beta = 20.87$, SE = 9.45, $t = 2.21$, $p < 0.05$). No other effects of bedding type, depth, or waste were significant. Age was negatively associated with sternal recumbency ($\beta = -8.13$, SE = 2.54, $t = -3.19$, $p < 0.05$) and lying bout duration ($\beta = -0.41$, SE = 0.14, $t = -3.0$, $p < 0.05$). Waste output did not differ between bedding types ($U = 552.5$, $z = -1.87$, $p = 0.062$), although a moderate effect was observed ($r = 0.42$). Bedding type was related to bed depth ($F[3,76] = 4.70$, $p = 0.005$), with lower depth at 0.50 vs 1.0 wheelbarrows ($p = 0.003$).

Table 1: Mean averages comparing bedding types (shavings vs straw-based)

Bedding type	Waste (barrows)	Bedding depth (cm)	Sternal- Recumbency duration (min)	Lateral Recumbency-duration (min)	Standing rest-duration (min)	Standing alert-duration (min)	Number of lying bouts-(count)	Rolling-(Count)	Head over door (min)
Group 1 straw based bedding	0.96	11.28	83	35.14	212.28	3.28	7.28	0	14.28
Group 2 shavings-based bedding	0.9	10.69	70.92	6.38	242.3	0	3.3	0.15	53.3
Standard Deviation	0.04	0.41	8.54	20.33	21.22	2.31	2.81	0.10	27.59

Discussion & Conclusions: Bedding type and age influenced sleep-related behaviour. Greater duration lateral recumbency on straw-based bedding aligns with previous studies (Greening et al., 2013). The effects of bedding type may reflect the way in which bedding was categorised as some shavings-based beds were mixed with straw. The significant effect of age is consistent with evidence that older horses lie down less due to musculoskeletal stiffness, joint discomfort, or increased difficulty rising from recumbency. No differences in waste-output were determined between bedding types. Although results were close to the threshold for significance, waste is likely influenced by other factors, including stable size, mucking-out frequency, and horse behaviour. Straw-based bedding enhances recumbent rest, suggesting benefits for welfare and supporting REM sleep. Older horses may require additional consideration due to reduced lying behaviour. As no clear differences in waste output were identified, bedding choice should prioritise comfort while considering yard management. Horse owners should take into consideration the recommended bedding depth of 10cm (Greening et al., 2021).

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Emotional Regulation in Equestrian Athletes

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Keywords: Cognitive Reappraisal; Expression Suppression; Performance

Introduction: Emotional Regulation (ER) refers to an individual's ability to control their response following an emotional experience, often through the use of implicit or explicit regulation strategies (Rolston and Lloyd-Richardson, 2017). The importance of ER in relation to sports performance varies based on a range of social, environmental and psychological factors (Boas et al., 2024). Within equestrian sport, the rider's emotional state is likely to influence performance due to horses' sensitivity to human emotion. This study aimed to explore ER in equestrian sport.

Materials & Methods: A questionnaire including the Emotional Regulation Questionnaire (ERQ) and additional demographic questions was published on social media. The ERQ is a validated measure of ER, consisting of 10 statements responded to on a 7-point Likert Scale (Gross and John, 2003). Demographic questions (including age, level and neurodiversity) were incorporated by researchers to allow for conclusions to be drawn regarding the study population. Two open-ended questions were incorporated to obtain participants' views regarding the importance of ER. A total of 1084 regular riders (1040 female, 38 male and 6 individuals who prefer to self-identify) aged 18+ and living in the United Kingdom self-selected to take part. Scores for the two ERQ facets, Cognitive Reappraisal (CR) and Expressive Suppression (ES) were calculated. Differences in ER between groups, such as neurotypical and neurodivergent riders and riders of varying levels, were tested utilising Mann-Whitney U and Kruskal-Wallis tests of difference. Content analysis was performed on the open-ended questions to systematically analyse written responses.

Results: Prominent findings of this study were differences in one or both ERQ facets for all individual factors explored. Significant differences in ES were found between genders, $H(2)=6.976$, $p=0.031$, with ES higher in males than females. Both facets significantly differed across age groups, CR $H(6)=57.212$, $p=<0.001$; ES $H(6)=23.995$, $p=<0.001$. Findings indicated that older riders had higher CR and lower ES than younger riders. Rider level was found to be of significance, CR was higher in professional riders than amateurs, $U=53196.500$, $Z=1.973$, $p=0.048$ and those competing above local level reported higher CR $H(3)=11.531$, $p= 0.009$. Significant pairwise comparisons regarding CR between local ($M=29.0$) and national ($M=31.0$) level competition riders ($p=0.032$, $r=0.870$) were reported. A higher CR ability in neurotypical riders compared to neurodivergent riders, $U=104838.500$, $Z=-3.158$, $p=0.002$. A high perceived importance of ER regarding riding and the horse-rider relationship in riders was shown with "Emotional Attunement", "Awareness", and "Leadership" among the key themes uncovered via content analysis.

Discussion & Conclusion: Findings suggest that riders' self-reported emotional regulation ability is impactful upon equestrian sports performance, and that riders are aware of the importance of ER in equestrian sports. This indicates the importance of supporting riders in developing their ER ability. Differences in ER in relation to individual factors such as age and gender should be

considered when supporting riders' ER development to optimise the performance and welfare of both horse and rider.

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Validating the use of a computer vision model to detect equine sleep-related behaviors in an academic setting

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Keywords: equine; welfare; sleep; computer vision

Introduction: Sleep is an essential biological process and a reliable welfare indicator, affecting an animal's mental state and health and influenced by all five domains of animal welfare. Observing equine sleep can be time-consuming, prone to subjectivity, and impractical for continuous use. Artificial intelligence (AI) offers a potential solution through automated behavior monitoring. This study aimed to validate an AI computer vision model for detecting equine sleep behaviors in an academic setting. We used an existing model evaluated on challenging new data, providing a valuable assessment of its capability for sleep behavior labelling, allowing us to reflect on the versatility of such models when applied to new data "in the wild", quite dissimilar from the ideal use-case. Model performance is discussed and how data collection and models can be optimized to improve it considered.

Materials & Methods: Videos used were collected through a collaboration agreement with Hartpury University. The videos selected for validation were representative of 12 different horses, in their usual environment. Video dates and times were chosen at random, with no repetition of hours. Videos, kept at the original 20fps, were manually annotated by the primary researcher. A proprietary single-stage CNN-based computer vision model, developed in October 2025, supplied by Vet Vision AI (www.vetvisionai.com), was then applied to them. Results of both were compared at frame level, taking manual annotations as ground truth. Videos were of variable duration (~1-2 hours) and were split into 15 min chunks for analysis and categorized as being videos with 'low' or 'full visibility' of the animal.

Results: The model performed with an overall accuracy of 77% when comparing its output to manual annotations, with behaviors like 'lying lateral' and 'standing' showing highest accuracy and general performance (Figure 1 & Table 1). 'Standing neckdown' was included in analysis but appears in the model for testing purposes to understand the ease of its deployability. The visibility comparison showed that on 'low visibility' videos accuracy was 64%, compared to 83% for 'full visibility' videos. This was valuable to understand missed instances in the 'lying sternal' category. Instances where the model did not detect a behavior, were often due to the horse being obscured by poor camera angles, lighting conditions and/or foreign objects, such as cobwebs, in front of the lens.

Figure 1. Confusion matrix representing the accuracy of the computer vision model in recognizing each behavioral category when compared to human manual annotations.

Table 1. Model performance metrics.

	Precision	**Recall**	**F1-Score**
Standing	0.78	0.92	0.84
Stranding Neck Down	0.98	0.67	0.79
Lying Lateral	0.92	0.90	0.91
Lying Sternal	0.88	0.60	0.71

Discussion & Conclusion: This model was applied to an academic/research setting, with data recorded at different angles than those it was trained on and would encounter when deployed by the company. Regardless, it shows promising results showcasing this technology's versatility and applicability to research. The model can often produce accurate labels even under significant deviation from training viewpoints. Based on this, the model can be uptrained to fit this type of data, likely improving performance and highlighting the evolving nature of AI. This study also stresses the importance of a computer vision-specific set up to allow models to recognize objects of interest, such as using wider angles and minimizing the time foreign objects obscure the lens. It is important to follow manufacturer guidelines; this study did not, creating a challenging environment for the model. Despite some limitations which we discuss, computer vision remains a promising tool for detecting sleep-related behaviors in horses, as it can do so consistently and in real-time, especially under sufficiently controlled camera setups.

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Investigating the effects of under-rug and ambient temperatures on Equine (*Equus caballus*) sleep quantity & quality.

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Keywords: Sleep; Microclimates; Ambient; Rugging

Introduction: Sleep and thermoregulation are closely linked (Harding, Franks and Wisden, 2019). However, this relationship remains unexplored in horses especially regarding rugging routines despite it being common practice. Recent advancements in measurements involving under-rug temperature measurements showed promise for larger scale projects but failed to take into consideration ambient temperatures and full day and night data collection (Donoghue, 2025). Considering the importance of sleep for welfare and its delicate nature for equines, this study aims to address these issues to enhance knowledge and optimise management practices.

Materials & Methods: A cohort of individually stabled horses (N=7, 3m, 4f) accessed from Hartpury Equestrian Centre were monitored using CCTV for three consecutive days. Duration of sleep related behaviours including sternal and lateral recumbency, standing sleep, standing rest, and latency to sleep onset (LSO) were collected using continuous focal sampling and a pre-determined ethogram adapted from Donoghue (2025). Under-rug temperatures were measured using Blue Mastro discs (BMD). A single disc was sewn into each rug on the left flank just behind the withers recording at one-minute intervals. Other temperature measurements were collected once on day three: rectal temperatures using an electric rectal thermometer, infrared measurements from a Wintact Infrared Thermometer, and human impressions of under-rug temperatures taken before other measurements, by one blinded participant placing their hand down the front left side of the rug over the shoulder. Ambient temperatures were recorded throughout using a BMD attached to a wall in the centre of the barn. Using IBM SPSS, linear mixed models (LMM) examined interactions between ambient and under-rug temperatures and sleep duration. Spearman's correlations assessed LSO, whilst logistic regression evaluated human interpretation, and Bland–Altman plots compared temperature measures.

Results: Mean under-rug temperature was 25.1 ± 2.6°C, a LMM revealed this remained stable, with no significant effect of ambient temperature ($p = 0.989$). Night 2 showed the highest sleep-related activity alongside higher temperatures but night 3 saw the most recumbency, although temperature effects on most behaviours were non-significant. Higher ambient temperatures were associated with increased standing sleep ($\beta = 12.86$, $p = 0.009$) and standing rest ($\beta = 93.98$, $p < 0.001$). As expected, under-rug temperatures were consistently lower than rectal readings (mean difference = -13.01°C, $p < 0.001$) and higher than infrared skin temperatures ($p = 0.003$). These temperature measures (rectal and infrared) did not significantly predict human interpretation of under-rug thermal state ($\chi^2(3) = 2.62$, $p = 0.454$).

Discussion & Conclusions: The data collected suggested that the equine sleep behaviour durations were limited, whilst they appeared to be more influenced by ambient than microclimatic temperatures, broader environmental conditions could be inhibiting this. Increased standing behaviour in higher ambient temperatures may reflect thermoregulatory adaptation through reduced metabolic rate (Hampton, 2022). Poor agreement between the temperature measures

highlighted limitations in representing core temperatures and the unreliability of human assessment of under-rug temperatures. However, due to the small sample size, further research to refine equine sleep management is necessary.

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Exploration and Analysis of Embedding Equitation Science into Curriculum

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Keywords: Equine learning theory; equitation science education; evidence-based practice; horse welfare

Introduction: The ethical training of horses relies on the correct application of equitation science (ES) (McLean and Christensen, 2017). However, little is known about how ES is embedded within practical equestrian teaching. Research in equestrian coaching indicates that knowledge of ES and equine learning theory is often limited or inaccurately applied (Torell Palmquist *et al.,* 2025), highlighting the need to examine how ES principles are trained in equestrian education. This study aimed to evaluate the experiences of students and coach practitioners involved in the practical teaching of ES, exploring their interactions, acceptance, and the challenges encountered, while identifying areas of good practice.

Materials & Methods: The design of the study was qualitative, inductive and explorative. Interview, focus group and workshop guides were developed using a community of practice. Five student focus groups (2–7 participants each), four in-depth individual coach interviews, and four workshop groups of coaches (4–6 participants each) were conducted by an experienced moderator using a semi-structured approach to encourage participants to share their experiences in depth. All discussions were transcribed and analysed using reflexive thematic analysis. Triangulating student and coach perspectives strengthened interpretation and highlighted the extent to which themes were shared across groups.

Results:

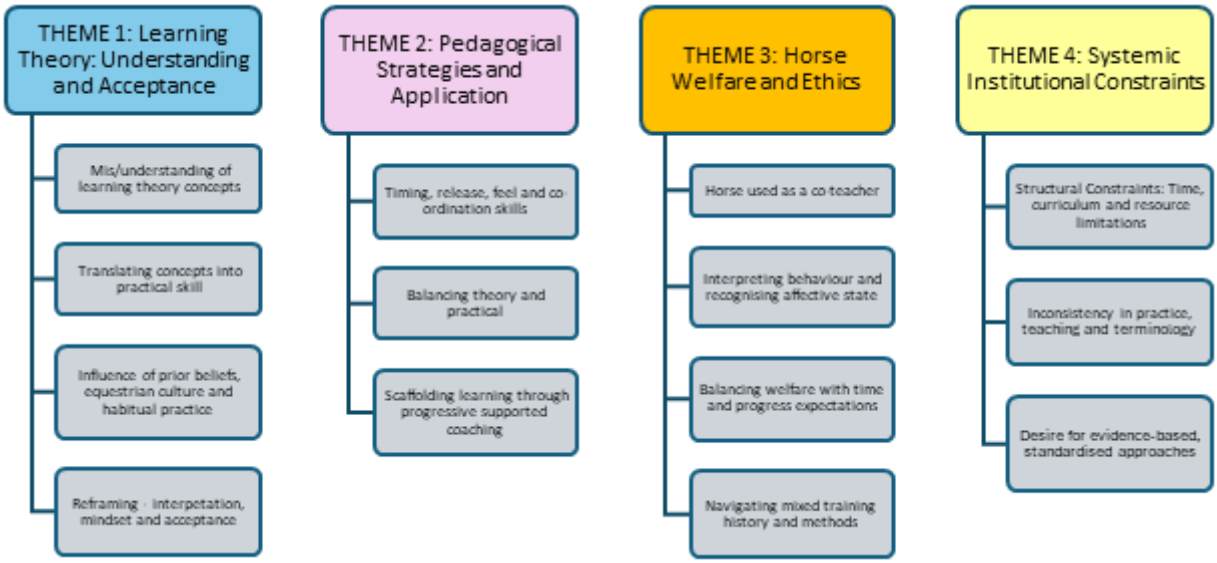

Figure 1: Themes and Sub-themes from the Student and Coach Data

Four higher-order themes were identified (figure 1). *Learning Theory: Understanding, Application and Acceptance* revealed that although students could articulate theoretical concepts, applying them within entrenched equestrian cultures and prior habits was challenging. *Pedagogical Strategies and application* highlighted the use of scaffolded teaching, with timing of the release emerging as a key difficulty. *Horse Welfare and Ethics* emphasised the role of the horse as a co-educator and the need to recognise equine affective states while balancing traditional and evidence-based methods. S*ystemic Institutional Constraints* noted inconsistencies, terminology confusion, and curriculum constraints, alongside a strong desire for unified, evidence-based industry standards.

Discussion & Conclusions: This study provides insight into how students and coaches experience the learning and teaching of ES. The findings highlight the central role of skilled coaching, the pedagogical approaches and the institutional support in helping students with developing timing, feel and understanding of training horses using ES. These processes have been found to incorporate horse welfare. Inconsistences in training methods, rushed industry expectations, and pressures from the curriculum affect horses' agency and wellbeing. Behaviour change is a key area for consideration in taking this forward in industry (Michie *et al.,* 2014). Overall, the study highlights practical ways to strengthen ES education, and support coach development whilst keeping horse welfare central.

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The Effects of Cranial and Cervical Myofascial Release on Equine Hindlimb Kinematics and Thoracolumbar Nociceptive Threshold

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Keywords: elasticity; protraction; stretching; heat

Introduction: Fascia, a global connective tissue, is imperative for the transmission and coordination of muscle generated forces. Through sub-optimal movement or injury, fascia may restrict, causing pain and decreased extensibility, with referred effects (Kodama et al., 2023). Myofascial release (MFR) is a manual technique aiming to release fascial restrictions. At present, there is no research on MFR's effect on nociceptive threshold or hindlimb kinematics in horses, therefore the aim of this study was to ascertain if MFR improves such parameters.

Materials & Methods: Seven horses (age: 15 ± 6.2 years, 14.3 ± 1.95hh) in light work were utilised in a within subject, cross-over design, in groups of 3 and 4. Reflective markers were placed on ventral tuber coxae and lateral coronet band to measure hindlimb protraction, retraction, stride length and tracking distance. Thoracolumbar mechanical nociceptive threshold (MNT) was gathered at 2cm and 10 cm from T9, T13, T15, T18, L3 and L6, recorded by a blinded assistant, before horses were in-hand trotted down a straight track 7m away from a spotlight and camera for kinematic data collection. MFR or contact based sham procedure utilising light contact were conducted along pre-determined sites, then MNTs and kinematic data collection were repeated. Statistics were completed on SPSS statistics. Parametric comparison data were analysed via 2-way ANOVA and correlations by Pearson correlation test. Non-parametric comparison data were analysed via a Wilcoxon test and correlations by Spearman's correlation test.

Results: MFR elicited a median increase in MNT at site T15 2cm before intervention (Median = 26.20) to after intervention (Median = 32.20, $z = 2.20$, $p = 0.028$). A median decrease in MNT at L3 2cm before sham (Median = 36.33) to after sham (Median = 29.20, $z = -2.02$, $p = 0.043$) was reported. All other MNTs were non-significant, with results grouped and a rough trend following the above results demonstrated. Hindlimb kinematic data was all non-significant at $p = 0.05$. There was a statistically significant, strong positive correlation between thoracolumbar nociceptive threshold and hindlimb protraction after intervention ($rs(7) = 0.760$, $p = 0.47$), and a non-significant but moderately negative correlation between thoracolumbar MNTs and hindlimb retraction after intervention ($rs(7) = -0.327$, $p = 0.474$). No significant findings were returned for correlations and sham procedure; however, trends demonstrated a weak negative correlation between thoracolumbar MNTs and hindlimb protraction/retraction before and after sham.

Discussion & Conclusion: MFR increases fascial elasticity and comfort, shown by the positive correlation between thoracolumbar MNTs and protraction after intervention. Whilst techniques such as stretching target similar effects, stretching can decrease muscle output and cause delayed onset muscle soreness, thus MFR could offer a favourable alternative (Richman, Tyo and Nicks, 2019). Spinal kinematics and MFR could be investigated in the future, with correlations suggesting increased elasticity over the dorsal aspect of the back promotes hindlimb protraction through increased spinal flexion. Sham procedure generally had negative effects, suggesting a partial release due to fascial heating, marginally decreasing lumbar bracing, and increasing sensitivity to pressure algometry (Robertson, Ward and Jung, 2005).

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Officiating in the Digital Age: An Investigation into Stakeholder Perceptions of Official Video Review in the Cross-Country Phase of Eventing.

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Keywords: accuracy, fairness, officiating, equestrian

Introduction: Official video review (OVR) can shape competitive outcomes in eventing, yet little is known about this process or how stakeholders view its use. Introduced to support rule enforcement and penalty allocation (FEI, 2020), OVR relies on human interpretation of footage and, therefore, introduces potential subjectivity and error in decision-making (Spitz et al., 2020), highlighting the importance of safeguarding principles of fair and equitable sporting standards (Collins, 2019). Despite over a decade of operational use, no empirical research has examined how those most affected, riders, officials, and organisers, understand or experience the process. Without this evidence, governance decisions risk being made in isolation from the lived experience of those the system is designed to serve. The aim was to investigate stakeholders' perceptions of OVR in the cross-country phase of eventing to inform future policy and technological advancements.

Materials & Methods: Participants (n = 109) completed an online JISC questionnaire, disseminated via social media, comprising multiple choice, Likert scale and open-ended questions examining perceptions of accuracy, fairness, safety and the impact of OVR on officiating roles. Quantitative data were analysed using descriptive statistics, Spearman's rank correlation, and Mann-Whitney U tests, with a significance threshold of $p < 0.05$. Qualitative open-ended responses were analysed through thematic analysis.

Results: Most respondents had fulfilled eventing roles in Europe (N = 85, 78%), including riders, officials, and organisers, and had over 15 years of experience (N = 63, 57.8%). A Spearman's rank correlation test identified a significant moderate positive relationship between familiarity with OVR and involvement in the review process ($r_s = 0.58$, $p < 0.001$). Most respondents believed that OVR positively impacts decision-making accuracy (89%) and fairness (89%) (Figure 1). Safety perceptions were more conservative, with 43.1% reporting a slight positive impact and 29.4% reporting no impact. Nearly half (48.6%) somewhat agreed that OVR may alter the responsibilities of officiating roles. Mann-Whitney U tests revealed no significant differences in perceptions of safety, fairness, accuracy, and impact on officials between participants who had experienced OVR and those who had not ($p > 0.05$). Qualitative analysis identified four themes: decision-making quality (objectivity and evidence reliability), safety (retrospective limitations), implementation challenges (cost, technology, standardisation), and impact on officiating roles (responsibilities and role displacement).

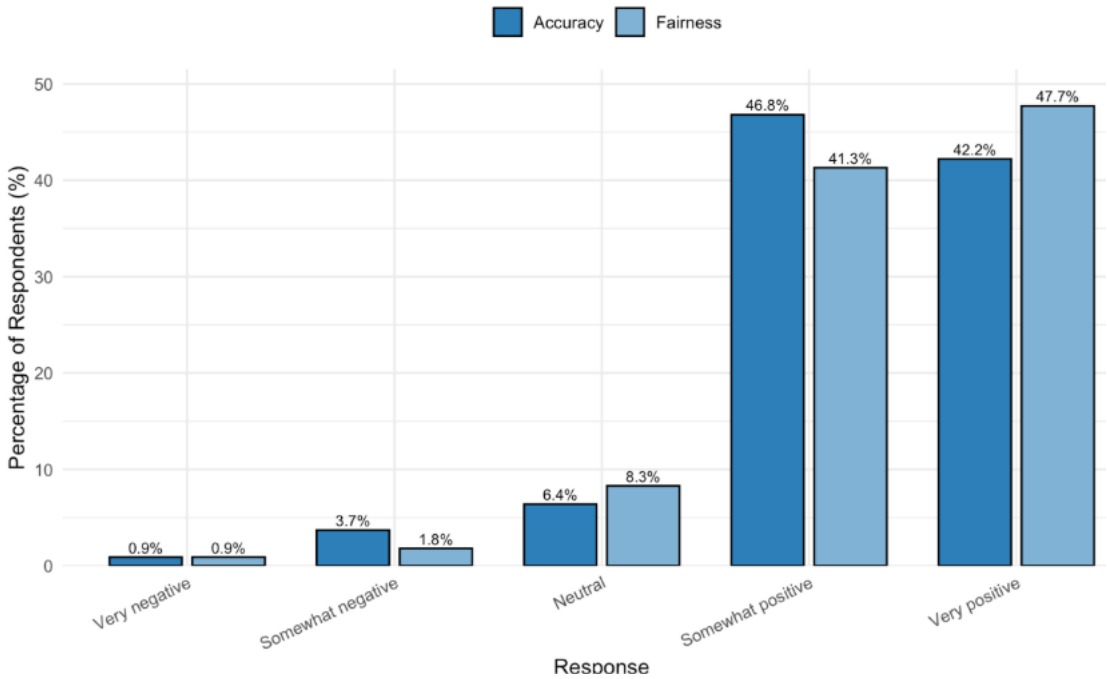

Figure 1: Respondent Perceived Impact of Official Video Review on Decision Accuracy and Fairness in Eventing (N=109).

Discussion & Conclusion: Stakeholders view OVR in cross-country eventing as beneficial for accuracy and fairness. However, perceptions of its contribution to safety were more cautious, reflecting uncertainty about how much OVR can support safety in the sport. Respondents also recognised that OVR may shift aspects of officiating roles, although there was little support for the idea that technology could entirely replace fence judges. These findings highlight the importance of ensuring that the review process is transparent and clearly communicated, so that officials, riders and wider stakeholders understand how decisions are reached. Future research should broaden geographic sampling and assess OVR's impact on officials' welfare and penalty decisions. If OVR is to strengthen eventing, it must operate as a transparent, resourced system that protects both fairness and the people who make the sport possible.

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