

THE IMPACT OF EQUINE WELFARE ON THE PILLARS OF SUSTAINABILITY: INSIGHTS FROM EQUESTRIAN SPORT

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The welfare of sport horses is increasingly recognised as a critical factor in the sustainability of equestrian sports. This study explores how key dimensions of equine welfare – nutrition, housing, health management, mental well-being, and social interactions – affect the environmental, economic, and social pillars of sustainability. A qualitative pilot study was conducted in Hungary using semi-structured interviews with three stable managers operating in competitive and educational equestrian contexts. The results indicate that while physical welfare needs are generally met, practices such as systematic mental health monitoring and comprehensive record-keeping are often inconsistent. These gaps pose risks not only to animal welfare but also to long-term environmental efficiency, operational costs, and public acceptance of equestrian activities. The study highlights the importance of integrating structured welfare protocols into daily management practices. It concludes that equine welfare should be treated not only as an ethical imperative but also as a strategic tool for sustainable sport development.

1. Introduction

The welfare of sport horses has transcended its traditional role as an internal concern within equestrian circles to become a central topic in broader societal discussions (Waran et al., 2007). Public scrutiny has intensified in recent years due to high-profile controversies, such as incidents during the Tokyo 2020 and the lead-up to the Paris 2024 Olympic Games, where the treatment of horses raised significant ethical concerns and attracted global attention (Douglas et al., 2022). These events underscore a growing societal demand for greater accountability and transparency in the treatment of animals used in sport (Campbell, 2021).

Beyond headline-making controversies, increasing attention has been directed at the daily living conditions of equine athletes. Issues such as insufficient space, lack of social interaction, inadequate access to pasture, and poor nutrition have emerged as central concerns in welfare debates (McGreevy et al., 2018). Equine welfare is a multifaceted concept encompassing physical health, emotional state, and the capacity to express natural behaviours. The Five Domains Model (Mellor et al., 2022) emphasises that welfare includes not only the absence of negative experiences but also the presence of positive ones—such as comfort, agency, and social engagement.

Concurrently, sustainability has emerged as a guiding principle across all sectors, including sport (Hautbois and Desbordes, 2023). In equestrianism, sustainability is traditionally considered from environmental and economic perspectives, focusing on pasture use, feed production, manure management, and infrastructure costs (Hedenborg et al., 2024). However, the intricate interconnection between equine welfare and sustainability remains underexplored. The “One Welfare” paradigm suggests that animal well-being is intrinsically linked to human and environmental well-being, with improvements in one domain often positively impacting the others (Tarazona et al., 2019).

This article aims to bridge this research gap by systematically examining how various dimensions of equine welfare—nutrition, housing, health management, mental well-being, social interactions, and human-animal relationships—affect the three key pillars of sustainability: environmental, economic, and social. Drawing on qualitative research conducted in Hungary, the study provides empirical insights into current equestrian management practices and highlights welfare as a strategic leverage point for fostering more ethical and sustainable equestrian systems globally.

2. Methods

This study builds upon a qualitative pilot investigation conducted in Hungary in December 2024. The research aimed to comprehensively explore the relationship between horse welfare practices and sustainability within equestrian facilities. The methodological framework focused on identifying key welfare-related management practices that could potentially influence the environmental, economic, and social sustainability of the sport.

A total of three equestrian centres were strategically selected using purposive sampling. The selection criteria ensured active involvement in both youth development programs and competitive sport across various disciplines, including show jumping, dressage, and eventing. The chosen facilities represented diverse geographic locations within Hungary, specifically Central Hungary and the Southern Great Plain, to capture a range of operational contexts. The size of the horse populations at these centres ranged from 25 to 100 individuals, and the estimated number of riders per stable varied between 40 and 270, encompassing a diverse user base including recreational riders, therapy participants, school riders, and competition athletes.

In-depth, semi-structured interviews were conducted with the managers of each facility. The interviewees were experienced professionals holding formal qualifications in equine studies or related fields, such as a horse trainer, riding instructor, or animal husbandry engineer. The interviews addressed multiple dimensions of horse welfare, including nutrition, physical environment (housing and turnout), health management (preventive care and injury management), social interactions among horses, mental well-being (assessment and support), and the human–horse relationship. Additionally, emphasis was placed on human resource management within the stables, recognising its critical role in delivering consistent and high-quality welfare practices.

The interview guide was rigorously developed based on the widely recognised Five Domains Model of animal welfare (Mellor et al., 2022). This model served as a robust conceptual framework to ensure the systematic coverage of both physical and psychological welfare factors. Each domain was associated with specific operational indicators designed to elicit detailed responses on existing management practices, daily routines, and the overarching organisational culture concerning equine care.

All interviews were audio-recorded with interviewee consent, transcribed verbatim, and subsequently analysed using thematic coding (Braun et al., 2006). Initial codes were generated inductively from the rich qualitative data, then systematically organised according to the established welfare domains. These themes were further classified by their potential impact on the environmental, economic, and social pillars of sustainability. It is important to note that the pilot nature of this study inherently limits the generalisability of its findings; however, it has provided critical insights and a strong foundation for designing a larger-scale, mixed-methods international study in the future. All participants provided informed consent, and the study adhered to ethical guidelines for research involving animal care professionals.

3. Results

3.1 Nutrition and feeding practices

All participating stables employed structured feeding routines, primarily consisting of hay and concentrated feeds, with rations adjusted according to the horse's individual workload. Two of the three establishments utilised pasture for housing and feeding, with one implementing a rotational grazing management system and the other using a fixed pasture field without rotation.

Feeding practices revealed distinct patterns based on performance level:

Equine athletes participating in high-level competitions were predominantly maintained under intensive housing conditions (individual stalls or stalls with single paddocks). Their diet typically included hay two to three times daily, grain concentrates one to two times daily, and additional performance-supporting supplements.

Hobby, amateur, and therapy horses exhibited more flexible housing arrangements, which varied seasonally between intensive housing and pasture access, depending on weather conditions. For these horses, grain was generally provided once daily, while hay was offered *ad libitum* or twice daily when stabled or in paddocks. In one establishment where pasture was unavailable, a large group paddock served as an alternative turnout area for lower-level competition and hobby horses.

3.2 Housing, Movement, and Physical Environment

All three facilities utilised individual stalls for housing, supplemented by daily paddock turnout. As noted above, two facilities provided access to pastures, but only one consistently implemented pasture rotation. For horses engaged in competitive training, turnout was typically individual, whereas therapy and school horses more frequently had access to group paddocks. Regular exercise programs were scheduled for horses kept in intensive conditions, utilizing either horse walker systems or round pens for lunging.

3.3 Health Management and Preventive Care

Routine veterinary care, including vaccinations, deworming, and hoof care, was consistently performed across all stables. However, preventive healthcare specifically aimed at injury avoidance was sporadic. Only one facility reported conducting regular orthopedic screenings for the early detection of lameness or joint issues. The degree of record-keeping for health events varied considerably among the establishments.

3.4 Mental Well-being and Stress Monitoring

None of the facilities employed systematic methods for monitoring horses' emotional states. While most respondents reported relying on informal observations during feeding or grooming, signs of distress were generally addressed reactively. One stable uniquely mentioned the use of surveillance cameras to assist with behavioural monitoring.

3.5 Human–Horse Relationship and Ethical Treatment

Interviews uncovered diverse perceptions regarding the horse's role, ranging from a "sporting tool" to a "partner." In high-level competition settings, the human-horse relationship was perceived as more of a performance tool in one establishment, while the other two viewed it as a partnership. Despite direct questioning always eliciting "partner" as a response, the actual horse career paths showed a varied picture: in one establishment, sporting aims were adapted to the horse's abilities, whereas in the other two, horses with lower performance were either retired or sold. Conversely, hobby riders and therapy programs consistently prioritise emotional bonding and ethical care. All stables encouraged direct involvement of riders in grooming and tackling, aiming to strengthen relational ties. Notably, one establishment had a written regulation on horse care, and another offered a dedicated program for young riders on horses and horse welfare.

3.6 Social Interactions Among Horses

All stables acknowledged the importance of horse-horse interactions. However, individual turnout was standard for competition horses to mitigate injury risks, while group turnout or adjacent paddocks were utilised for school and therapy horses. Most respondents concurred that some degree of visual and tactile contact should be maintained between horses, although safety concerns (particularly with shod horses) limited the implementation of full group housing for all animals.

4. Discussion

The findings from this study illuminate the multifaceted interplay between equine welfare practices and the various pillars of sustainability within the equestrian sport context. Our results highlight key areas of convergence and divergence across different stables and horse categories, particularly concerning nutrition, housing, health management, mental well-being, human-horse relationships, and social interactions. These practices invariably impact environmental, economic, and social sustainability, as well as the ethical foundation of the sport.

4.1 Nutrition and Feeding Practices: A Balance Between Performance and Natural Behaviour

The ubiquitous presence of structured feeding routines across all participating stables, encompassing hay and grain concentrates adjusted for workload, underscores a foundational commitment to basic equine nutritional needs (NRC, 2007). However, the observed variations in these practices, particularly between high-level competition horses and amateur/therapy horses, reveal underlying tensions between performance demands and welfare considerations.

Intensive feeding regimens for high-level equine athletes, characterised by limited hay access (two or three times daily) and multiple grain and supplement feedings, are designed to meet extreme energy requirements (Harris et al., 2017). Yet, this approach often deviates from the horse's natural foraging behaviour, which involves continuous, small-meal consumption of fibrous material (Ellis et al., 2015). Such restrictive feeding can predispose horses to digestive issues like gastric ulcers and colic, as well as behavioural stereotypes, indicating compromised welfare (Winskill et al., 1995). From a sustainability perspective, the reliance on processed grain concentrates and supplements can carry a higher environmental footprint due to resource-intensive production, transportation, and storage processes compared to forage-based.

Conversely, hobby, amateur, and therapy horses often benefit from housing conditions that seasonally integrate pasture access and more frequent (or ad libitum) hay availability in paddocks or stables. This approach better aligns with the horse's evolutionary design, promoting gastrointestinal health, reducing stress, and allowing for natural foraging behaviours (Maurício et al., 2024). The provision of ad libitum hay is particularly beneficial for gut health and mental well-being, mitigating the risks associated with prolonged fasting (Roig-Pons et al., 2025). Economically, a forage-centric diet can also be more sustainable by potentially reducing reliance on costly concentrate feeds. The absence of pasture in one facility, compensated by a large group paddock, highlights an adaptive strategy to provide social interaction and movement, though it remains a compromise without the full benefits of natural grazing.

4.2 Housing, Movement, and Physical Environment: Optimising Space for Welfare and Sustainability

The widespread use of individual stalls combined with daily paddock turnout across all facilities represents a common compromise in equine management, aiming to balance individual needs with practical limitations. While individual stalls provide security and ease of management, prolonged confinement can negatively impact equine physical and psychological welfare, leading to reduced bone density, muscle atrophy, and behavioural issues (Mills and McDonnell, 2005). Daily turnout, even if individual, is crucial for mitigating these effects by allowing for locomotion and expression of natural behaviours.

The differing turnout strategies – individual turnout for competition horses versus group paddocks for therapy and school horses – reflect a primary concern for injury prevention in high-value athletes. However, restricting social interaction through individual turnout can negatively impact the psychological well-being of a highly social species like the horse. The use of horse walkers or round pens for scheduled movement in intensive conditions is a proactive measure to ensure adequate exercise, but it does not fully replicate the benefits of free movement in varied environments (Lesimple et al., 2020).

Pasture access, present in two facilities, offers significant welfare advantages, including opportunities for natural grazing, continuous movement, and social interaction. The implementation of rotational grazing management in one facility stands out as a critical practice for environmental sustainability. This method enhances soil health, promotes biodiversity, reduces soil erosion, and optimises nutrient cycling by preventing overgrazing and allowing pasture regeneration (Teague et al., 2011). Conversely, the use of a fixed pasture field with no rotation risks environmental degradation through overgrazing, leading to reduced pasture quality and increased susceptibility to erosion (Hedenborg et al., 2024). Sustainable pasture management, therefore, directly contributes to the environmental pillar of sustainability by preserving ecosystem services (Furtado et al., 2022).

4.3 Health Management and Preventive Care: Proactive Approaches for Longevity and Economic Viability

The routine implementation of veterinary care (vaccinations, deworming, hoof care) in all stables is a testament to basic animal husbandry standards (Brown et al., 2013). This foundational level of care is essential for maintaining a healthy equine population, which in turn contributes to the long-term economic viability of equestrian operations by preventing costly illnesses and extending the working life of horses.

However, the finding that preventive healthcare to avoid injuries was sporadic, with only one facility reporting regular orthopaedic screenings, highlights a significant gap. Proactive injury prevention, such as routine orthopaedic assessments, could lead to early detection of lameness or joint issues, allowing for timely intervention and potentially preventing severe, career-ending injuries (Camargo et al., 2018). This not only improves equine welfare by reducing pain and discomfort but also offers economic benefits by minimising veterinary costs, downtime, and the need for early retirement or sale of horses. The variability in record-keeping further underscores a potential area for improvement, as systematic data collection is crucial for effective health monitoring, identifying trends, and optimising preventive strategies.

4.4 Mental Well-being and Stress Monitoring: Towards a Holistic View of Equine Health

The general lack of systematic monitoring of horses' emotional states, despite informal observations, points to a prevailing reactive approach to mental well-being. While informal observations during feeding or grooming are valuable, they may not capture subtle or chronic signs of distress, which can impact performance and welfare over time (Hausberger et al., 2021). Addressing signs of distress only reactively means that underlying issues might escalate before they are fully recognised.

The mention of surveillance cameras for behavioural monitoring in one stable represents a more proactive and systematic approach. Technological advancements can significantly aid in identifying subtle changes in behaviour that may indicate stress, pain, or anxiety, allowing for earlier intervention and improved welfare outcomes. Integrating objective behavioural assessment tools into routine management protocols would enhance the ethical treatment of horses and contribute to the social license of equestrian sport by demonstrating a commitment to the animal's psychological well-being. This shift towards a holistic view of equine health, encompassing mental well-being, is crucial for modern sustainable equestrian practices and aligns with integrative welfare frameworks that emphasise the interconnectedness of animal, human, and environmental well-being (Pinillos et al., 2016).

4.5 Human-Horse Relationship and Ethical Treatment: The Foundation of Social Sustainability

The interviews revealing diverse perceptions of the horse's role – ranging from a "sporting tool" to a "partner" – are central to the ethical and social sustainability of equestrian sport. While all respondents directly answered "partner," the practical realities of a horse's career path, particularly in high-level competition, often contradicted this ideal. The practice of adapting sporting aims to a horse's abilities, as seen in one establishment, aligns strongly with an ethical, partner-centric view, promoting longevity and welfare. Conversely, the swift retirement or sale of horses with lower performance in other establishments, while perhaps economically driven, reflects a more utilitarian "tool" perception. This can raise ethical concerns about the disposable nature of animals in competitive contexts.

In contrast, hobby riders and therapy programs prioritising emotional bonding and ethical care exemplify a stronger commitment to the horse as a sentient being. The universal encouragement of direct rider involvement in grooming and tacking across all stables is a positive practice for strengthening relational ties and fostering empathy, which is fundamental for promoting responsible animal stewardship (Luke et al., 2024). The presence of a written regulation on horse care and a program for young riders on horse welfare in two establishments are commendable initiatives that contribute significantly to the social sustainability of the sport by formalising ethical guidelines and educating the next generation of equestrians. These measures enhance transparency and accountability, crucial for maintaining public trust and the sport's "social license to operate."

4.6 Social Interactions Among Horses: Balancing Safety and Natural Needs

The acknowledgement of the importance of horse-horse interactions by all stables reflects an understanding of the horse as a social species (McGreevy et al., 2018). However, the implementation strategies vary, again often dictated by perceived risks, particularly for competition horses. Individual turnout as standard for competition horses to avoid injuries is a prevalent practice rooted in legitimate safety concerns, especially with shod horses (Goodman et al., 2018). Yet, this practice can lead to social deprivation, potentially contributing to stress and behavioural issues.

The use of group turnout or adjacent paddocks for school and therapy horses indicates a more welfare-focused approach where the risk-benefit analysis allows for greater social contact. The consensus that some degree of visual and tactile contact should be maintained, even if full group housing is limited by safety concerns, points towards a recognition of basic social needs. Innovative stable designs that facilitate sensory contact between individually housed horses, such as stalls with open fronts or shared walls, could provide a valuable compromise, allowing for social interaction while minimising injury risks (Hausberger et al., 2021). Finding practical solutions to facilitate social interaction, even for high-performance horses, is a critical area for improving equine welfare and ensuring the long-term ethical sustainability of equestrian sport. The findings of this study confirm that the interpretation and implementation of equine welfare practices vary significantly among facilities, even when basic standards are met. This heterogeneity reflects not only differences in resources and management philosophies but also the evolving societal expectations surrounding the ethical treatment of animals in sport.

One notable outcome is that although all stables satisfied the minimum physical welfare requirements (nutrition, housing, veterinary care), there was limited emphasis on documenting procedures or systematically monitoring psychological welfare. Similar trends have been observed in previous research, where mental well-being was often the most neglected dimension of animal welfare. This gap is critical, as emotional stress in horses may have long-term impacts on both performance and health, with corresponding consequences for sustainability.

From a sustainability viewpoint, the data suggest that horse welfare is not merely an ethical obligation but a multi-dimensional factor influencing long-term viability.

5. Conclusions

This study demonstrates that equine welfare is closely interlinked with all three pillars of sustainability. While the examined facilities generally fulfilled the physical requirements of welfare, key aspects such as mental health monitoring and systematic record-keeping were inconsistently addressed. These gaps have direct implications for environmental efficiency, economic viability, and social acceptance.

The findings suggest that pasture access, proactive health care, and ethical rider–horse interactions can improve both animal welfare and sustainability outcomes. Facilities that incorporate structured welfare protocols and educational strategies are better positioned to respond to public concerns and regulatory expectations.

To enhance the long-term sustainability of equestrian sports, horse welfare should be embedded into institutional policies rather than relying solely on personal commitment. Further research involving larger samples and international comparisons is recommended to support the development of universal guidelines that link welfare practices to sustainability performance indicators.

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