Bio Vet Innovator Magazine

Volume 2 (Issue 4) APRIL 2025

OPEN ACCESS WORLD VETERINARY DAY – 26 APRIL 2025 POPULAR ARTICLE

A Review on Transportation Management and Welfare of Equines: Modes, Precautions, and Welfare Considerations

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DOI: https://doi.org/10.5281/zenodo.15333008

Received: April 11, 2025
Published: April 18, 2025

Abstract:

The transportation of horses is a routine and necessary aspect of modern equine management for purposes such as competitions, breeding, sales, and medical needs. However, it poses significant stress and welfare concerns for the animals. This review presents a comprehensive understanding of the transportation of horses, highlighting the various modes (road, air, rail, and sea), management practices, pre-transport preparation, and post-transport requirements. Additionally, it delves into transport-induced stress, physiological and behavioral indicators, and best practices to ensure animal welfare during transit.

Keywords: Transportation, horses, management and practice.

Introduction:

The practice of transporting horses has evolved from historical needs during warfare and trade to modern-day requirements for breeding, sports, sales, and veterinary interventions. While modern transport systems have become more sophisticated, they still pose serious concerns regarding animal welfare. Transport stress can lead to both behavioural and physiological disturbances in horses, including conditions like respiratory diseases, injuries, colic, and even mortality in severe cases. Studies have shown that the temperament of a horse, its past travel experience, and environmental conditions during transport all influence the level of stress experienced (Friend, 2001; Fazio *et al.*, 2008b). Therefore, understanding and implementing effective management strategies before, during, and after transport is critical for ensuring equine welfare and maintaining performance.

Modes of Transport:

- **Road Transport:**

Road transport is the most frequently used method for moving horses, involving the use of horse

trailers or modified lorries. The internal conditions of these vehicles, including vibration, temperature fluctuations, space, ventilation, and exposure to unfamiliar surroundings, can significantly affect a horse's stress levels. Trailers should have smooth, non-slippery flooring, sufficient headroom, and safe partitions to minimize injuries. Studies by Smith *et al.* (1996a) have demonstrated that the combination of low-pressure radial tires and proper suspension systems offers a smoother ride, which can reduce travel stress. Proper vehicle design and careful driving practices are essential to minimize physical discomfort and behavioural issues.

- **Air Transport:**

  Air transport is commonly used for the international movement of high-value horses, particularly those used in sports or breeding. Horses are generally transported in specially designed "jet-stalls" or in open stall systems, which can accommodate up to three animals along with grooms. While loading and unloading are considered the most stressful stages of air travel, studies have shown that horses often adapt well during flight, maintaining resting heart rates and even exhibiting relaxed behaviors (Stewart *et al.*, 2003; Munsters *et al.*, 2013). Quarantine regulations and biosecurity measures are typically enforced post-flight to ensure health safety. Monitoring and minimizing environmental stress in quarantine facilities is crucial to avoid physiological strain (Ohmura *et al.*, 2012).

- **Rail Transport:**

  In India and some other regions, horses are also transported via rail, especially over long distances. Indian Railways provides specialized horse boxes or adapts regular wagons for animal transport. Animals are generally moved via passenger trains; in areas without such facilities, goods trains are used with appropriate safety provisions. The number of horses that can be accommodated in a rail wagon depends on the size of the wagon and the breed of the horse. Proper handling, ventilation, and regular inspection during rail travel are essential to minimize travel-related stress.

- **Sea Transport:**

  Although sea transport of horses has become less common, it is still used for exporting certain equine breeds such as polo ponies. Large cargo ships with dedicated horse decks are used for such purposes. The welfare of horses during sea travel is a shared responsibility among owners, exporters, ship masters, and handlers. These parties must ensure that the animals are fit to travel, appropriately restrained, and provided with sufficient food, water, ventilation, and veterinary care. Emergency plans and contingencies must be in place to address any unexpected situations during sea transport.

Stress During Transport:

Transport stress in horses is a multifactorial issue involving behavioral and physiological responses to environmental changes. Horses exhibit behavioral signs such as restlessness, reluctance to load or unload, head tossing, aggression, and reduced feed and water intake. Physiological markers of

stress include elevated levels of cortisol, ACTH, creatine kinase, glucose, and altered white blood cell counts. Stress during transport can increase susceptibility to health conditions such as pneumonia, colic, diarrhoea, and laminitis (Mars *et al.*, 1992; Padalino, 2017). These health risks underscore the importance of minimizing stress through proper planning and animal handling during transport operations.

Management Strategies:

- **Before Transport:**

  Preparation before transport is critical for reducing stress and ensuring the safety of both the horse and the handlers. Horses should be trained for loading and unloading, which is often the most stressful part of the journey. Health checks must be performed, and vaccinations should be up to date. Horses should be fitted with appropriate protective gear such as leg wraps and head bumpers. The transport vehicle must be cleaned, disinfected, and prepared with non-slip flooring and safe partitions. Adequate ventilation and lighting within the vehicle also contribute to a less stressful environment.

- **During Transport:**

  During the journey, horses should be monitored frequently for signs of distress. Water should be offered every 4–6 hours, with increased frequency in hot and humid conditions. For longer journeys, providing hay can keep the horses occupied and reduce anxiety, though grain should be avoided due to the risk of colic and choking. Trailers must be well-ventilated and free from excessive noise and motion. Avoiding sudden braking, rapid acceleration, and sharp turns is essential for maintaining balance. A groom should ideally accompany every three to nine horses, depending on the transport scale, to manage the horses and provide support when needed.

- **After Transport:**

  Upon arrival, horses may appear either excited or fatigued. They should be unloaded calmly and given access to water, hay, and a quiet resting environment. Gentle walking may help relieve stiffness from prolonged travel. It is essential to monitor rectal temperature and general behavior over the next 72 hours to detect early signs of transport-related illness such as shipping fever. Recovery periods vary depending on the duration and method of travel; a one-day rest is recommended for short trips, while three or more days are advisable after long-distance or air transport. Monitoring feed and water intake during recovery is equally important.

Welfare and Legal Considerations:

Legal frameworks and animal welfare guidelines such as those from the OIE and national livestock transport regulations govern horse transportation. These regulations require that horses be fit for travel, adequately spaced, and transported in approved vehicles for journeys exceeding eight hours. Vehicles

must be equipped with anti-slip flooring, adequate ventilation, and facilities for inspection. They must also be clearly marked to indicate the presence of live animals. Recommended space per horse varies with age and size—for example, adult horses require approximately 1.75 m^2, ponies 1.0 m^2, and foals about 1.4 m^2. Overloading, inadequate air quality, and excessive travel time can lead to serious welfare violations and must be avoided. Compliance with hygiene standards, including cleansing and disinfection of transport vehicles between trips, is mandatory to prevent the transmission of infectious diseases (Leadon *et al.*, 2008; Weeks *et al.*, 2012).

Recommendations for Future Research and Practice:

Future efforts in equine transport should focus on the integration of smart technologies, such as biosensors for real-time monitoring of stress indicators like heart rate and body temperature. GPS and thermal regulation systems can help track vehicle conditions and intervene when necessary. Behavioral training methods to desensitize horses to loading and transit environments should be further explored to improve adaptability and reduce anxiety. Additionally, breed-specific responses to transport should be studied to develop customized transport protocols that ensure optimal welfare.

Conclusion:

Transporting horses involves more than just moving animals from one place to another; it demands an understanding of equine behaviour, physiology, and welfare needs. From vehicle preparation to post-transport care, every step influences the health and safety of the horse. By adopting stress-reducing practices, proper vehicle design, and strict hygiene protocols, the risks associated with transportation can be significantly minimized. Innovations in technology and research-based strategies should continue to enhance the overall experience of equine transport and ensure the highest standards of animal welfare.

Competing Interests: Authors have declared that no competing interests exist.

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