Maximising performance
Rachel Murray MA VetMB MS PhD Diplomate ACVS

Optimising performance is dependent on having a holistic approach to the management and preparation of horses at top level, and having a rapid detection and reporting system for any problems or subtle alterations in performance. Building a relationship with riders/owners/trainers that is one of trust and not threat is important so that any alterations are reported and investigated quickly, with a long term goal in mind. At elite level, tiny alterations in management can win or lose medals, so it is critical that these management factors are optimised and monitored as well as possible.

Training factors
Repetitive overload injury is a major problem in sport horses, and is one of the frequent limitations for performance.
Core muscle development is vital to perform the required skills and provide a stable support platform for the rider and limbs, which is increasingly important with greater extravagance of movement.
Development of the limb stability musculature is important in protecting the joints and structures of the limb.
Different sports require different training programmes: Dressage is performed at low heart rates but requires considerable muscle strength in specific muscles groups. Show jumping is performed at higher heart rates and also requires strength in specific muscle groups. Eventing requires relatively greater cardiorespiratory fitness.
A training programme requires balancing of training types: muscle strength and endurance, cardiorespiratory fitness, and skills, avoiding over-repetition of skills training.
Use of cross training is important in prevention of lameness\textsuperscript{1}.
Turnout exercise was not a risk factor for lameness\textsuperscript{1}.
Importance of recovery time between training sessions.
Planning of a training programme with respect to competitions is useful in optimising performance (eg avoiding glycogen depletion for important muscle groups in the last 72 hours into competition) and preventing over training.

Veterinary problems
Repetitive overload injury is a major problem in sport horses, and is one of the frequent limitations for performance.
Rapid recognition and detection of subclinical problems is important to institute alterations in management to prevent escalation of problems which could be mistaken for training issues including:
- Subclinical (or clinical) orthopaedic issues/pain
- Subclinical (or clinical) infection/metabolic/respiratory/gastrointestinal problems
Respiratory problems increase risk of lameness\textsuperscript{1} – importance of respiratory management
Arena surfaces

Arena surfaces and features of arena surfaces are associated with risk of lameness in dressage horses\(^1,2\).
Particular arena surface features appear to be associated with different types of lameness.
Adaptation to a single arena surface takes place if a horse trains on a single arena type, so this potentially reduces the risk of injury on that surface if the horse only ever trains on that surface. However, training on various surfaces may be useful in improving adaptation to different surfaces.
Variation in training surface is important for proprioceptive training.

Nutrition

The starch/oil/fibre balance can influence behaviour, condition, metabolic problems, and gastric ulceration. Optimising this balance for the individual horse can have a large influence on performance.
Balance and range of nutrients is essential for muscle development and performance.
Prevention/management gastric ulceration
Hindgut bacterial balance is particularly important during stressful periods including travel, competition, changing of feed.
Feeding for travel and competition should be planned, including timing and type.
Adaptation to forage and concentrates prior to competition/travel important.

Shoeing

Type with respect to horse’s gait, training surface, level.
Timing with respect to competition – aim to compete at mid-shoeing cycle.

Tack\(^3,4\)

Horse/tack/rider interaction has a large impact on the horse’s posture and movement.
Selection of optimal tack for each horse, including saddle, bridle, girth, bridle, bit combination based on scientific principles.
Essential that tack is fitted to each horse on a frequent basis – horses can change rapidly and may require adaptations following travel or during competition

Warm up in competition\(^5\)

Duration and intensity with respect to type of horse, stage of competition, weather, type of venue, and avoiding muscle fatigue from over-repetition being used to build rider’s confidence.

Travel

Timing with respect to competition
Feed, water, positioning/restraint in vehicle, ventilation

Further reading:
5. Murray RC, Mann S, Parkin TDH. Warm-up in dressage competitions: association with level, competition type and final score. Equine and Comparative Exercise Physiology 2007; 3(4); 185–189.