

The Relationship Between Foot Conformation, Foot Placement and Motion Symmetry in the Equine Hind Limb

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Reasons for Performing Study

The relationships between hind foot conformation, placement and motion symmetry in the equine hind limb are poorly defined. Little research has been carried out into the potential interactions between these variables despite the commonality of hind limb lameness in sports and leisure horses.

Objectives

To determine hind foot placement and describe the relationships between hind foot conformation, placement and motion symmetry.

Study Design

Observational study.

Methods

Overall foot placement of forty-three horses (16 of which were hind limb lame) was determined from simultaneous orthogonal filming at walk and trot, foot conformation was measured from digital photographs and motion symmetry data was collected using horse mounted inertial sensors.

Results

Left and right hind foot conformation differed significantly ($p=0.001-0.036$). Foot placement was not significantly different between left and right feet, despite these conformational differences. Foot placement was significantly different between walk and trot ($p<0.001$). Lateral heel landing was the most common landing pattern observed at walk (55.81%) and trot (43.12%). Lateral and lateral toe landings were more common at trot, though relatively uncommon at both gaits. Foot conformation was significantly associated with motion symmetry ($p<0.001-0.007$) and with placement at trot ($p=0.002-0.005$) but not walk.

Conclusions

Hind feet land preferentially laterally and heel first at both the walk and trot. Foot conformation appeared to be associated with landing patterns at the trot but not walk. Foot conformation was also associated with motion symmetry, although it is difficult to say whether conformation affects symmetry or vice versa. Multiple factors contribute to equine locomotion, foot conformation, landing patterns and the maintenance of orthopaedic health.