**Introduction**

Numerous oral joint supplements are available, but there is limited research into their efficacy. This study evaluated the effect of an oral joint supplement on orthopaedic evaluation scores and limb kinematics in horses.

**Methods**

24 mature horses (71% 1–4/10 lame) were included. Exclusions were poor body condition, health problems, or lameness >4/10. Supplement S (FlexAbility TM, Science Supplements, containing chondroitin sulphate 182 g/kg, glucosamine 190 g/kg, vitamin C 80 g/kg, methyl sulphohydren 256 g/kg, DHA 66 g/kg); EPA 34 g/kg, or placebo P (carrier/flavours only) were fed to horses for 21 days each in a random order triple-blind crossover design. Horses were evaluated at day 0 (baseline), 21 (after first treatment) and 42 (after second treatment). Clinical orthopaedic evaluation for straight line and lunging circle (walk and trot), and during ridden exercise (walk, trot and canter) was performed. Side-view high-speed motion-capture (240 Hz) determined midstance tarsal flexion, carpal extension and fetlock extension for straight line trotting. All evaluators were blinded to treatment. Effect of treatment, sequence, limb and interactions were investigated using linear mixed models.

**Results**

S was associated with significantly lower lameness grade in a straight line (P = 0.001) with individual horses improving up to 2/10 grades and circle (P = 0.010) than either P or baseline. For horses with hindlimb lameness, supplement S was associated with significantly greater tarsal flexion than baseline (4.2% greater, P<0.02) or P (2.7% greater, P<0.037).

**Conclusions**

Oral administration of supplement S was associated with less lameness than P or baseline. Increased mid stance tarsal flexion of lame limbs may indicate improved mobility or comfort during peak loading.

**Ethical Animal Research**

Explicit owner informed consent for participation in this study is not stated. **Sources of funding:** World Horse Welfare, Science Supplements. **Competing interests:** Rebecca Frost is employed by Science Supplements. Vicki Adams and Rachel Murray are involved with Science Supplements on a consultancy basis.