

QUESTION: Does feeding an oral joint supplement improve equine limb motion, and orthopaedic, physiotherapy and handler evaluation scores.

This study has been published: Murray et al. (2017) A Randomised, Blinded, Crossover Clinical Trial to Determine the Effect of an Oral Joint Supplement on Equine Limb Kinematics, Orthopaedic, Physiotherapy, and Handler Evaluation Scores. Journal of Equine Veterinary Science 50 121–128.

Background

- Despite the broad range of equine oral joint supplements available, there has been very limited research into their efficacy.

Aim of Study

To determine the effect of an oral joint supplement on limb motion, and orthopaedic, physiotherapy and handler evaluation in horses.

Study Design

- *Placebo-controlled* = some horses received the joint supplement and some received a supplement with no active ingredients (placebo). Use of a placebo helps reduce bias (seeing a false positive result) and allows for the fact that an improvement might be observed from horses spontaneously improving.
- *Randomised* = which horses were given placebo first was pre-determined by a random system rather than a person deciding at the time of seeing a horse. This removes bias in the results caused by selecting only certain horses (e.g. less lame horses) to have a particular treatment.
- *Blinded* = none of the people assessing the horses knew which horses received the joint supplement and which received the placebo supplement. Blinding removes bias caused by people wanting to see a positive effect with the joint supplement e.g. by giving it to the least lame horses or grading these horses less harshly.
- *Crossover* = all horses received both the joint supplement and the placebo which allows the response of a horse to the real supplement to be compared with the same horse's response to the placebo supplement. Removing horse to horse variation in this way makes crossover trials potentially more efficient than similar sized, parallel group trials in which each horse is exposed to only one treatment.

Study Outline

Seventeen mares and seven geldings completed the study, with an average age of 8 years. No horse had received any medication for at least 7 days prior to the study or was on any ongoing treatment that could have had an effect on performance/locomotion, as per International Equestrian Federation guidelines. The joint supplement (FlexAbility, Science Supplements) or placebo was given to horses in their feed, twice daily, for 21 days each, following manufacturer's recommendations. FlexAbility contained chondroitin sulphate, glucosamine, vitamin C, methyl sulfonyl methane, docosahexaenoic acid, eicosapentaenoic acid in a rice flour carrier with a vanilla flavour. Placebo contained only the inert rice flour carrier and vanilla flavour and was indistinguishable from FlexAbility. All horses received FlexAbility and placebo in a crossover design. All staff involved in feeding and handling the horses, and all people evaluating the horses were blinded to treatment. Horses were evaluated at day 0 (baseline), 21 (after first treatment) and 42 (after second treatment). Assessments included: clinical orthopaedic evaluation for straight line/lunging circle in walk and trot; high-speed motion-capture determined hindlimb motion for straight line trotting; grading of limb range-of-motion and muscle tone based on standardised physiotherapy criteria; handler grading of specific criteria during pasture, groundwork and ridden exercise. Effect of treatment, sequence, limb and interactions were analysed using statistics.

Study Results

- Horses fed FlexAbility had significantly lower grade lameness scores in a straight line and circle, with individual horses improving up to 2/10 grades over placebo/baseline (Table 1). For horses with hindlimb lameness, FlexAbility was associated with significantly greater hock flexion than baseline (4.2% greater) or placebo (2.7% greater) (Table 2).
- FlexAbility was also associated with significantly improved limb range-of-motion and muscle tone and ridden/groundwork scores were significantly higher with FlexAbility compared to placebo/baseline.
- Horses fed FlexAbility were graded significantly higher for 'ease-of-movement' at pasture compared with placebo/baseline.

Gait feature	Treatment	Limb	Interaction
<i>Straight line assessment</i>			
Walk	0.001		
Toe drag at walk			
Circumduction at walk	0.01	0.002	0.01
Pelvic displacement at walk	0.04	0.00007	0.004
Head movement at walk			
Trot	0.001	0.0007	
Toe drag at trot	0.1	<0.00001	0.04
Circumduction at trot	0.004	0.009	
Pelvic displacement at trot	0.9	<0.00001	
Head movement at trot	NS		
Small circle left	0.01	0.001	
Small circle right	0.007	<0.001	
Flexion test	0.008	0.001	
<i>Lunging</i>			
Lunge on left rein	NS	0.004	
Toe drag on left circle	0.3	0.00001	
Circumduction on left circle	0.045	0.009	
Bend to outside left circle	NS	0.04	
Head movement left circle	NS		
Lunge on right rein	0.01	0.02	
Toe drag on right circle	NS	0.0003	
Circumduction right circle	0.014	<0.00001	0.015
Bend to outside right circle	0.0001	0.00006	<0.00001
Head movement right circle	NS		

Table 1: Clinical orthopaedic evaluation: results of statistical analysis of the effect of treatment on grading for gait features in a straight line and on the lunge in horses ingesting FlexAbility or placebo. P values are reported for the treatment effect (NS=not significant) and for any significant interaction and/or limb interaction effects.

Measured parameter	Baseline	Placebo	Supplement S	P value
Mid-stance HL fetlock extension (°)	231.18±8.67	231.28±8.42	233.03±7.52	0.45
Mid-swing HL fetlock extension (°)	159.63±9.90	163.62±5.73	154.19±5.51	0.82
Mid-stance hock flexion (°)	156.2±4.2	155.0±4.2	152.5±1.9	0.005
Mid-swing hock flexion (°)	112.42±6.29	112.29±9.35	109.84±9.84	0.30
Speed	2.37±0.10	2.38±0.12	2.4±0.09	0.18
Stride length	1.87±0.17	1.85±0.20	1.85±0.18	0.62
Stride duration	0.64±0.07	0.66±0.07	0.67±0.06	0.25
Stance duration	0.28±0.03	0.30±0.06	0.30±0.02	0.37
Swing duration	0.35±0.09	0.36±0.06	0.40±0.13	0.82

Table 2: High-speed motion analysis: results of hindlimb motion evaluation for all horses with hindlimb lameness (n=9) in horses at baseline, after feeding FlexAbility, and placebo (mean ± SD). Effects of treatment probability value is given in the right hand column. There was a significant effect of treatment on mid-stance tarsal flexion but not on other parameters. HL hindlimb.

Take Home Message

- Feeding FlexAbility at the manufacturer recommended level was associated with less lameness, and improved physiotherapy scores, ridden/groundwork scores and pasture 'ease-of-movement'.
- Increased mid-stance hock flexion of lame limbs may indicate improved mobility/comfort during peak loading, supporting a positive effect of the supplement.