

A preliminary study on the effects of head and neck position during feeding on the alignment of the cervical vertebrae in horses

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Evidence on the subject of how feeding could affect overall musculoskeletal health is largely anecdotal with very little scientific research. In modern stabling routines, the use of a hay net or other container to feed forage is common as many owners want to reduce wastage from floor feeding. The effect of head and neck position has been studied regarding its influence on the biomechanics of the horse during locomotion and how it can affect musculoskeletal health and function. The aim of this study was to investigate whether head and neck position during feeding had a significant effect on the alignment of the atlas and cervical vertebrae in the neck of the horse. Using a crossover study, twelve horses (4-14 yrs, mixed sex, similar work level) were fed hay from three different sources (haynet, Hay Bar, floor) spending 14 days in each condition. All horses were fed the same type and similar quality of forage (hay) and all had been examined by a veterinarian or equine dental technician within six months of the start of the study. All participants received four chiropractic (McTimoney approach) treatments by a qualified therapist blinded to treatments; at time periods 0, 14, 28, 42 days, each at the start of a new condition. Duplicate palpations for vertebral asymmetries and soft tissue tension (poll, neck, shoulder, pectoral, thoracic, lumbar, gluteal regions) were noted and recorded by the investigator. Soft tissue tension noted as were behavioural reactions. Frequency data were analysed using chi-squared test using a two-way contingency table. Data included the frequency of atlas rotation and tilt following each condition and the frequency of misalignments found in the cervical vertebrae (2-5) following each condition. Analysis indicated there was no significant association between forage feeding method and frequency of atlas rotation misalignment ($\text{Chi}^2=5.5$, $\text{df}=4$, $p>0.05$), atlas tilt ($\text{Chi}^2=1.0$, $\text{df}=4$, $p>0.05$) or cervical vertebrae misalignment ($\text{Chi}^2=1.22$, $\text{df}=4$, $p>0.05$). There was a significant association between muscle tension frequency in fore and hind quarters and feeding method ($\text{Chi}^2=10.6$, $\text{df}=4$, $p<0.05$). There was a higher frequency of horses with neck muscle tension following the haynet (36%) and Hay Bar (41%) condition but lower frequency following the floor condition (17%). Following the haynet condition all horses showed muscular tension in noted areas of the body, compared to the floor and Hay Bar conditions where a percentage of participants (33% and 16% respectively) had no muscular tension noted. This study provides preliminary data that feeding method may affect cervical spinal alignment and associated muscle tension. Further research is recommended using skin markers and electronic data analysis to establish measureable effects. Results may have implications surrounding rehabilitation following injury or encouraging healthier joint motion but more importantly it shows how horses are fed could have a detrimental effect on overall musculoskeletal health.

Lay person message: The method of feeding hay to horses (floor, haynet, Hay Bar) affects the head and neck position on a daily basis. This study suggests an effect on the musculoskeletal system, with notable differences in areas of muscle tension. It provides concerning links between how horses are fed and their musculoskeletal health, as well as implications to rehabilitation.

Keywords: Equine, welfare, vertebrae, forage, haynet, haybar