

Hyperflexing the horse's neck: a cost-benefit and meta-analysis

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In ethical discussions, a cost-benefit analysis requires that welfare costs associated with an activity can be reliably estimated and balanced against the potential benefits of the activity to both humans and animals. The current study applies a meta-analysis to the peer-reviewed evidence for costs and benefits of hyperflexion of the neck in horses; a practice that has attracted enormous public and scientific scrutiny over the past 15 years. A literature review identified 55 studies dealing with horses' head and neck postures. Forty-two of these studies examined the impact of various postures on equine welfare, for example, by assessing behavior, physiological stress parameters, health or rider-horse interaction. Thirty-five studies examined the impact of various postures on gymnastics (e.g. kinematics, shifts in weight distribution, muscle activity, airway functioning or overall workload). For the meta-analysis a dataset containing information from each of the individual studies was created. Data included information such as type, degree, duration and circumstances of hyperflexion applied in that particular study as well as information on the horses (e.g., sport discipline, level of training, breed) and on the study design (e.g., size of study and experimental or epidemiological research design). The results of the study regarding the impact of hyperflexion on a) welfare and b) gymnastics were coded as positive (1), insignificant or contradictory (0) or negative (-1). The significant majority of studies (88%) concluded that a hyperflexed head and neck posture negatively impacts welfare. Just one study suggested welfare advantages of

training in a hyperflexed head and neck posture. An analysis using a generalized linear mixed model to assess the influence of the above factors collated in the dataset revealed that none of these factors significantly influenced the probability of a study to detect negative welfare implications. Thus hyperflexing the neck appears to impair horses' welfare regardless of, for example, the duration or the way of achieving hyperflexion. A concurrent assessment of the evidence for gymnastic benefits showed that approximately one quarter of studies conclude that there may be benefits, while another quarter of the studies conclude that hyperflexion has detrimental effects on gymnastics. Thus, on the costs-side there is a clear reduction in equine welfare and some undesirable gymnastic effects, as well as likely a compromised profile of the equestrian sports in public. Benefits, on the other hand, include some desirable gymnastic effects, and potentially increased control of the horse for the rider. On balance, it appears that the costs associated with hyperflexion exceed the potential benefits of the activity to both humans and horses.

Keywords horse, head-and-neck posture, hyperflexion, welfare, gymnastics