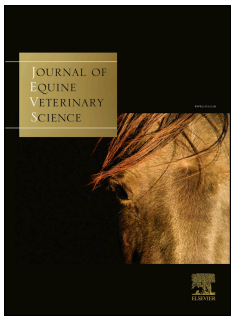
Accepted Manuscript



Electromyography in the horse: a useful technology?

Jane M. Williams

PII: S0737-0806(16)30454-3

DOI: 10.1016/j.jevs.2017.02.005

Reference: YJEVS 2264

To appear in: *Journal of Equine Veterinary Science*

Received Date: 23 July 2016

Revised Date: 7 February 2017

Accepted Date: 7 February 2017

Please cite this article as: Williams JM, Electromyography in the horse: a useful technology?, *Journal of Equine Veterinary Science* (2017), doi: 10.1016/j.jevs.2017.02.005.

Review

Electromyography in the horse: a useful technology?

Jane M. Williams*

Performance in Equestrian Sports Group, Hartpury University Centre, Gloucester, GL19 3BE, England, UK.

**Corresponding author email: jane.williams@hartpury.ac.uk ; +44 (0) 1452 702640*

Keywords: electromyography; equine; indwelling EMG; surface EMG; equine muscle

Summary:

Equine performance research to date has focussed on cardiorespiratory and biomechanical assessment of the horse neglecting the role of muscles. This review considers electromyography (EMG) in the horse, with a specific focus on the role of surface electromyography (sEMG) as a tool to analyse muscle activity in the sports-horse. Three themes have been evaluated in the horse using EMG: muscle recruitment, muscle activity during exercise, and fatigue. Results support kinematic research and add to the knowledge base on how the horse moves. . sEMG is a relatively non-invasive technology requiring clipping which can be used effectively in the ridden horse. Understanding equine locomotion and how muscles responds during different exercises could inform and evaluate training practices used in the sports horse. However, issues exist for example individual variation, accuracy of sensor placement and preventing noise within the EMG signal. Therefore key concepts in research design, data acquisition and processing are explored to inform future studies and to enable reasoned judgements on the validity and reliability of sEMG as a tool to investigate muscle recruitment and activity, and subsequently assess performance in the horse. The high level of inter-subject variance observed in between subjects' designs combined with differences seen between individuals may preclude reliable comparison of muscle performance between groups of horses. Therefore within subject designs are