Psychology of equine performance and the biology behind laminitis

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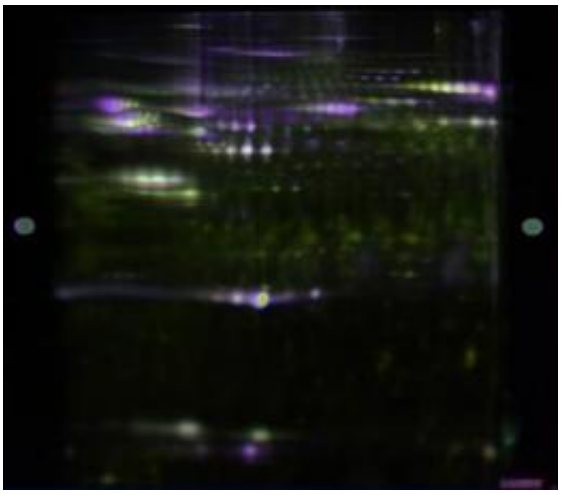
Research published in BioMed Central's open access journal *BMC Veterinary Research* looks at the devastating disease laminitis, and finds that it is linked to general inflammation, especially of the digestive system. Credit: Dr. Samantha Steelman

Achieving the best performance from a horse is the goal of not just professional riders, but also the millions of amateur and hobby riders all over the world. A new article published in BioMed Central's open access journal *BMC Veterinary Research* looks at the issues surrounding training, competition environment and practices, and how the psychology of horse mood, emotion and temperament can be used to enhance performance. A sister article looks at the devastating disease laminitis, and finds that the anti-inflammatory protein apolipoprotein A-IV (APOA-IV) is raised in chronic laminitis, which suggests that it is

linked to a more general inflammation, especially of the digestive system.

Laminitis is a painful and debilitating disease. Although the exact cause is unknown it is often associated with insulin resistance and obesity, and can be preceded by diseases such as colic and diarrhea. It is known to occur in horses allowed the freedom to eat lots of lush fresh, grass especially after being kept indoors for the winter. Inflammation can lead to irreversible rotation of the foot bones inside the hoof. In 75% of cases the inflammation becomes chronic 'founder', leaving the horse permanently lame.

Prof Bhanu Chowdhary and Dr Samantha Steelman from the College of Veterinary Medicine, Texas A&M University, found 16 proteins which have different levels in the blood of horses with and without chronic laminitis. Horses in both groups were in good health apart from the laminitis. Eleven of these proteins are involved in response to wounding, coagulation and inflammation, such as coagulation factor X. The remaining proteins included fetuin A and B, both of which are involved in acute immune response, immunoglobin, an indicator of increased antibody levels, and most importantly APOA-IV.



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Dr Steelman explained, "APOA-IV is produced by the small intestine – one of its functions is to tell the animal when it is full. It also has anti-oxidant and anti-inflammatory properties, which might explain the raised levels of APOA-IV."

In a comprehensive review of psychological factors affecting equine performance Dr Sebastian McBride from the Royal Agricultural College and Prof Daniel Mills from the University of Lincoln have looked at how current behavioral research and already established behavioral modification techniques could be applied to enhance the performance of animals at competition level.

This includes matching a horse's temperament to different equestrian disciplines, for example, flightiness can be good for racing but detrimental for dressage. Dr McBride commented, "Another important consideration is the horses mood and emotional reaction. Although all of these have an intrinsic baseline observable in the young, untrained horse, they can be influenced by training and they are also dependent on the interaction between rider and horse. Competition riders are well aware how a strange environment, and nerves on competition day, can affect their horse's performance."

Prof Daniel Mills continued, "The increased competitiveness and performance level of equestrian sport means that for each horse and rider pair physical and psychological behavior must be taken into consideration when designing training conditions and increasing

motivation to perform at the optimum level of athletics. They must also be applied to reducing over-emotional reactions on competition day and, given the trained horse's high motivation to succeed, to decrease any negative experiences at competitions which may otherwise impact on future events."

More information: Increased Plasma proteomics shows an elevation of the anti-inflammatory protein APOA-IV in chronic equine laminitis, Samantha M Steelman and Bhanu P Chowdhary, BMC Veterinary Research (in Press)

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