

ADIPONECTIN AS A CLINICAL BIOMARKER FOR LAMINITIS RISK

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The aim of this project is to improve early detection of the painful foot disease laminitis, this project will evaluate the value of a promising biomarker for the condition called adiponectin.



Our horses are eating better quality pastures and feeds than ever before, so they are becoming overweight and unhealthy. Just like in humans, diseases of metabolism are increasingly apparent in horses. In particular, metabolic conditions where insulin secretion is increased are increasingly recognized. Researchers do not know exactly what causes the insulin concentrations to reach and remain at these high levels in some horses. High insulin levels are a major problem in horses because they cause the painful hoof disease called laminitis. Laminitis results in lameness, and in about 30% of cases the horse needs to be euthanized.

This project aims to improve our ability to determine the risk of laminitis in an individual animal. To do this we will examine a hormone that is found to be at lower concentrations in horses that are at risk of developing laminitis. We currently do not know much about this hormone in horses, but this project will extensively examine the hormone. We will determine the normal levels and fluctuations of the hormone after eating, and how it changes in animals that have metabolic disease and are prone to laminitis. We will determine whether the hormone concentration differs between horse and pony breeds, and what concentration of the hormone can be used to predict the relative risk of laminitis.

In addition to inappropriate diet, metabolic disease in horses is also likely to be due to underlying genetic variations. Due to the complexity of metabolic disease in horses, it is likely that many genes are involved. However, these genetic factors have not yet been identified. As part of this project, we will examine the sequence of the gene that codes for adiponectin, and determine whether the sequence varies between healthy horses, and those with metabolic disease.

If a difference in the genetic sequence between animals is identified, we will determine whether or not this genetic change contributes to the disease. If it does, it could become part of a genetic test that helps to identify animals at risk of laminitis in the future. Overall, this project will improve our ability to predict and prevent laminitis, lessening the impact of this important disease.

Importance to the Equine Industry: Laminitis is the second most common reason for equine veterinary consultations (after colic), and most cases of laminitis are due to high insulin concentrations (and this is the type of laminitis being investigated here). The disease is intensely painful, and due to a lack of effective drug treatments for laminitis many sufferers do not survive. Losses associated with laminitis are increasing, because diets rich in sugars and starch are more commonly fed, even when the horses are not in work. This excess food contributes to high insulin concentrations, the root cause of disease. Thus, laminitis represents a significant economic, social and welfare burden to the horse industry and horse-owning communities worldwide. By improving our ability to detect which individuals laminitis is more likely to occur in, this project will enable better management of horses at risk of laminitis. This will ultimately reduce the number of horse suffering from the disease through improved ability to predict its onset and earlier recognition of risk so that preventative measures can be introduced. A reduction in the number of cases of laminitis will improve horse welfare, reduce the costs associated with laminitis treatment and increase the productivity of horse industries, such as racing and sporting associations and breeding facilities.

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