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## **Humoral and cell-mediated immune responses to influenza vaccination in Equine Metabolic Syndrome (EMS) horses**

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### **Abstract**

Obesity is an increasing problem in the equine population with recent reports indicating that the percentage of overweight horses may range anywhere from 20.6-51%. Obesity in horses has been linked to more serious health concerns such as equine metabolic syndrome (EMS). EMS is a serious problem in the equine industry given its defining characteristics of insulin dysregulation and obesity, as well as the involvement of laminitis. Little research however has been conducted to determine the effects of EMS on routine healthcare of these horses, in particular how they respond to vaccination. It has been shown that obese humans and mice have decreased immune responses to vaccination. EMS may have similar effects on vaccine responses in horses. If this is the case, these animals may be more susceptible to disease, acting as unknown disease reservoirs. Therefore, we investigated the effects of EMS on immune responses to routine influenza vaccination. Twenty-five adult horses of mixed-sex and mixed-breed (8-21 years old) horses; 13 EMS and 12 non-EMS were selected. Within each group, 4 horses served as non-vaccinate saline controls and the remaining horses were vaccinated with a commercially available equine influenza vaccine. Vaccination (influenza or saline) was administered on weeks 0 and 3,

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