

Effect of Time of Day of Vaccination in Horses on Pro-Inflammatory Cytokine Gene Expression

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Vaccines are widely used in animal industries to stimulate humoral and cell mediated immune responses. The cell mediated immune response uses specific cells which communicate through messenger molecules, such as cytokines, with other cells to elicit the immune response. Studies have shown that cytokine expression was increased in the evening hours, and additional research has suggested that a higher concentration of cytokines in the blood could lead to a stronger protective response from the immune system. The purpose of this study was to determine if the time of day of vaccination affected the gene expression of interferon gamma (IFN- γ) in the blood of horses. Fourteen horses (10.4 ± 5.9) were blocked by breed and randomly assigned to one of two vaccination groups: AM or PM. All horses received mixed grass hay and water ad libitum and were housed in outdoor paddocks with access to shelter. Horses in the AM and PM groups were vaccinated intramuscularly against Eastern and Western encephalomyelitis, rhinopneumonitis (EHV-1 and EHV-4), influenza (type A2), tetanus and West Nile Virus at 0700 and 1900 hr, respectively. Blood samples were collected via jugular venipuncture immediately prior to vaccination (d 0) and on d 7, 14 and 21 post-vaccination. RNA was extracted using the PAXgene Blood RNA Kit. The RNA concentrations ranged from 13.47 ng/ μ L to 159.60 ng/ μ L. RNA samples will be subjected to reverse transcription and quantitative real time PCR using the AGPath-ID One Step RT-PCR Kit to determine IFN- γ and β -GUS, a housekeeping gene, levels in response to time of day of vaccination. All data will be collected and analyzed prior to the forum. It is expected that PM vaccination will increase IFN- γ expression.