

# Unexpected results and confounding factors in Serum Amyloid A (SAA) testing

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**To avoid unexpected SAA results it is critical to understand basic SAA biology and interpret results in light of other clinical data.**



Presenting complaint and duration of disease

are particularly valuable to consider when a normal or low result is obtained, as this would be expected with localized, chronic, or allergic disease. Likewise, historical information should be evaluated to determine if a horse has any other factors that could cause increased SAA, as this may affect interpretation of values.

Veterinarians are often most confused by negative or low results in animals that are clearly sick. Production of SAA is stimulated by acute, systemic inflammation; therefore localized, chronic, or allergic issues should not be expected to cause significant increase. These negative or low positive results can still be very useful as they help narrow down possible etiologies and indicate a low likelihood of systemic inflammation due to bacterial or viral infection. It is also important to note that although SAA increases very rapidly following an inflammatory insult, a horse can show peracute signs of illness before measurable levels of SAA have been produced. If this is the case, treatment should be based on clinical signs, and rechecking SAA in 12-24 hours will show an increase.

## VACCINATION ELICITS STRONG SAA INCREASE

SAA will increase from any acute inflammatory stimulus, which can include intramuscular administration of vaccines or other injections.<sup>1,2</sup> Maximum levels are reached at 2-4 days post-vaccination and should gradually return to normal by 7-10 days, depending on the peak value. In horses with a history of regular vaccination, concentrations typically stay below 500-1000 mg/mL. However, some horses can reach over 3000 mg/mL while still appearing completely healthy, which may be more prevalent in younger or vaccine-naïve individuals.

Increased SAA may also be seen in horses receiving other intramuscular injections, particularly large-volume antimicrobials. The exact level is dependent on the amount of inflammation stimulated by the injection(s). Surgery itself will also cause an increase, peaking at 48-72 hours post-op. However, persistent or re-emergent elevation should trigger investigation for underlying complications.<sup>3,4</sup>

If no confounding inflammatory stimulus can be identified, elevated SAA should be considered an indicator of a subclinical process that could have significant disease potential, and further investigation is warranted. At a minimum, SAA should be rechecked 24 hours later. If an active inflammatory process is occurring, values should be even higher. Significant increases in SAA are not expected due strictly to stress, and physical exertion will cause minimal increase at most.<sup>5</sup>



Potential issues with testing procedure can be considered if unexpected results are observed without other logical explanation. A control line should always be present in tests that develop normally, decreasing in intensity with increasing concentration of SAA. Absence of this line indicates an issue with the test. If suspicion is high that something went wrong, it can be repeated and the procedure evaluated to ensure all necessary steps are performed properly, including following all precautions. It can be helpful to retain an anticoagulated blood sample for testing in more controlled circumstances if necessary, such as back at the clinic or office.

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## REFERENCES

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