SAA is a major acute phase protein which is synthesized in the liver as part of the acute phase response. It is considered to be part of the first line of defense in response to inflammatory stimuli including trauma, stress, infection, neoplasia, and inflammation. We have validated this assay in our laboratory and determined in-lab reference intervals. The marked variation in SAA levels in clinically ill horses and rapid decrease in elevated levels seen in response to successful therapy may allow SAA to be more useful as a monitoring tool and prognostic indicator than traditional markers of inflammation. These concepts were also well discussed in a review paper by Jacobsen and Andersen (Equine Veterinary Education 19:38-46, 2007).

Some other published novel applications of SAA testing in horses:

- **Sports Performance** – SAA levels have been shown to be a potential indicator of performance in endurance horses (Equine Veterinary Journal 42:23-27, 2010). Most of the horses that did not finish the long distance race showed elevated SAA levels. The authors proposed that this elevated biomarker indicated the presence of underlying subclinical disease, overtraining, or minor injuries that worsened with the race. Other anecdotal information has also been presented in a similar application of SAA testing in race horses. These concepts were also voiced by Pepys et al. (Equine Veterinary Journal 21:106-109, 1989) and Williamson et al. (Australian Equine Veterinarian 29:84, 2010).

- **Body Condition and Fitness** – SAA levels were found to be significantly associated with body condition score and insulin levels. Acute phase proteins are known to be increased with obesity in humans and other animals. This first report indicates that SAA may be a reflection of underlying inflammation associated with poor fitness. (Journal of Equine Veterinary Science 31:251, 2011).

- **Monitoring Pregnancy** – SAA levels were reported to be increased more than 20 fold in horses with early embryonic loss (Reproduction in Domestic Animals 46:624-629, 2011).

- **Monitoring Post Surgery Complications** – The trauma of surgery alone is significant enough of a stimuli to induce SAA expression and the level of this biomarker will vary with the intensity of the surgery (Veterinary Surgery 38:762-769, 2009). With healing, SAA levels return to normal range within several days. Baseline and postoperative monitoring of SAA can be valuable to assess the presence of post surgery complications (Equine Veterinary Journal 37:552-556, 2005).

- **Monitoring Complications in Foals** – Chavatte and coworkers reported that significantly higher levels of SAA were found in foals with infection versus elevations seen with traumatic or premature birth (Equine Infectious Diseases VI 21:106-109, 1989). Later studies by others similarly reported increased SAA with birth and significant 2-4 fold additional increases in SAA in cases of neonatal septicemia (The Veterinary Journal 176:393-396, 2008, Equine Veterinary Journal 33:599-603, 2001, Equine Veterinary Journal 34:693-698, 2002).

- **General Health Assessment** – SAA has been found to increase with a wide variety of health issues. It can be used in diagnostic and prognostic applications with management of bacterial and viral infections. (Equine Veterinary Journal 21:106-109, 1989.).

- **Monitoring Joint Disease** – Both experimental models and naturally occuring joint disease have been studied for acute phase protein expression. Synovial fluid and serum samples were found to have high SAA levels in animals with suspected bacterial infection, infectious arthritis, and other high inflammation joint problems (American Journal of Veterinary Research 67:1738-1742, 2006).