OmniChek™-SAA*

Multispecies Rapid Test

Inflammation Detection Made Simple

EQUINE PARTNERS AMERICA LLC

SAA* = Serum Amyloid A

Rapid, multispecies testing for inflammation in animals

Detection of Inflammation

Advances in diagnostic technology and increased understanding of relevant biomarkers now make it possible to detect and quantify inflammation, particularly that arising due to infection. Furthermore such tests give insight into an animal's health status and useful information for selection of treatment choices[1].

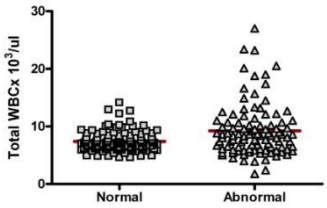
First to market with a multispecies test, Accuplex Diagnostics has developed a point of care test for the inflammatory biomarker, Serum Amyloid A (SAA) in whole blood, which is simple to use and gives a result in just minutes.

When animals suffer an injury or exposure to infection a host of responses occur to limit the damage and begin the repair process. Among the first of these responses, innate immunity is mediated by the release of inflammatory cytokines and responsible for the outward signs of inflammation (increased blood flow, swelling and fever). The first phase of the innate immune response or "acute phase" involves changes in the blood concentrations of a group of proteins collectively referred to as acute phase proteins[2]. The effects of such changes in the blood are used routinely in medicine as assessments of health, clinicians using erythrocyte sedimentation rate (ESR), white blood cell count (WBC) and significantly, C-Reactive Protein (CRP) to detect and measure active infection.

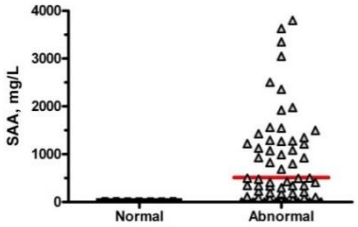
Until very recently, equine vets only had the option of using white blood cells, fibrinogen or direct culture to help detect inflammation and infection. However, the introduction of testing for SAA using Accuplex Diagnostics' **EquiChek™-SAA**, has added a powerful new tool to their diagnostic toolbox. With the introduction of **OmniChek™-SAA**, general veterinary practices now have this tool as well.

The charts below show levels of SAA and WBCs in horses with and without clinical conditions. Published studies exist for many species. Increases in SAA are rapid, and significant (100-1000 fold), unlike WBC (where the increase is often < 2-fold).

White Blood Cells



Serum Amyloid A



Whereas there is significant overlap in the range of WBC in normal vs sick animals, the discrimination between these groups using SAA levels is more clear-cut[3].

Serum Amyloid A in Animals

There is a growing body of research showing that biomarkers of inflammation such as SAA provide a very useful additional tool in assessing health and wellness. Serum Amyloid A is highly conserved and is the major biomarker of inflammation in most species. In addition to human, some of the other species in which SAA has been shown to be a major biomarker of inflammation and infection include:

- Equine
- Canine
- Feline
- Rabbit
- Goat
- Sheep
- Bovine
- Elephant
- Non-human primates
- Seals and Manatees

In healthy animals, the normal levels of SAA are very low (range 1-10 µg/ml), but when the body is challenged, for example, because of infection, SAA increases within hours to levels ranging from 10-

1000-fold above normal depending on the species. This is in contrast to white blood cells and fibrinogen which may only increase from 2-3-fold and yet remain within a broad normal range. The rise in SAA during an inflammatory response is much clearer. Many clinical and subclinical conditions will result in a significant increase in SAA enabling early detection of such conditions.

Serum Amyloid A vs C-Reactive Protein

C-Reactive Protein (CRP) has been shown to be an important biomarker of inflammation and infection in some species (notably Human and Canine) but significantly it is not responsive in many important species and in cats CRP levels have been shown to be relatively unaffected by injury severe inflammation and trauma[4]. Of considerable importance, the response of SAA to inflammation and infection is present in a wider range of the species so far studied, suggesting SAA may be a more useful and consistent biomarker for inflammatory status across species.

OmniChek™-SAA Test Kit

OmniChek™-SAA is a simple to use test, which can be performed without need of special equipment. The test has been designed to measure inflammation (and thus infection) in multiple species. This means there is no need to carry multiple test formats for different animal groups.

To date the practical use of SAA in veterinary medicine has been limited due to the lack of suitable tests. With the introduction of **OmniChek™-SAA**, general veterinary practitioners now have a consistent tool to assess inflammation, infection and health status across multiple species using a single test device, simplifying purchasing and workflows.

It simple design and operation means that **OmniChek™-SAA** can be used in the clinic or in the field, beside the animal, for example in a farm, stable or even a zoo. No lab equipment or sample processing is required, just a small drop of blood, and results can be read in less than 10 minutes.

An easy to read semi-quantitative visual result indicates whether the pet has normal, moderate or clinically significant inflammation.

Uses of OmniChek™-SAA

- Confirming the presence of an active inflammatory condition at the point of care, therefore supporting prompt diagnosis and treatment decisions.
- Alerting to subclinical inflammation or confirmation on suspicion of underlying illness and to support more detailed investigation.
- Real-time monitoring of disease status, therapeutic efficacy and recovery progress.
- As part of a general “Wellness” check pre vaccination.
- Monitoring the effectiveness of vaccination response.

Test Procedure

Step 1: Remove test cassette from foil pouch.

Step 2: Remove cap from blood tube and insert sample applicator. Just touch sample applicator to surface of the blood. DO NOT IMMERSE SAMPLE APPLICATOR IN BL0OD TUBE. DO NOT SQUEEZE the sample applicator; blood will be drawn up automatically up to the red line on the sample applicator.

Step 3: Apply sample to the sample port on the test strip. Touch sample applicator to the sample port and gently squeeze to expel blood into the test window.

Step 4 : Add 3 drops of liquid from the dropper bottle into the sample port.

Step 5: The result can be seen in the Test Window (Figure 1). It is recommended that the test is read at between 5 - 10 minutes after starting. However, a normal result can be seen within 2-3 minutes, i.e. 4 lines will be visible. Do not read after 10 minutes as lines may fade.

Interpretation of Results

A normal healthy animal will have 3 clear lines in the test.

An animal with a strong inflammatory problem such as infection may have just 1 line visible.

Where there is mild to moderate inflammation a second line will be visible to a greater or lesser degree.

Animals with evidence of low grade inflammation should be retested within 24 hours to establish inflammatory status. As with all diagnostic tests, a definitive clinical diagnosis should not be based on a single result, but should only be made after all clinical and lab findings have been considered.

References

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2. Acute phase response in Animals: A review, in Comparative Medicine 59(6). Pages 517-526
3. Assessment of serum amyloid A testing of horses and it clinical application in a specialized equine practice. JAVMA 243(1). Pages 113-119
4. Acute phase proteins in healthy and sick cats. Research in veterinary science 93 (2012) 649-654

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