

Detect and Monitor Inflammation and Infection in Cats Using the Feline SAA TurboReader™ Assay



What is Serum Amyloid A (SAA)?

Serum Amyloid A (SAA, 12 kDa) is a major acute phase plasma protein that is associated with high density lipoproteins (HDL) in plasma [1]. Like other acute phase proteins, normal physiological concentrations of SAA in healthy cats is extremely low (<10 mg/l) [2]. However, baseline SAA levels in healthy animals are generally higher in older cats and female cats [3].

Why use SAA as a diagnostic marker?

Sensitive Diagnostics:

Early detection of inflammation before the presence of clinical symptoms. The SAA concentration in the blood starts increasing already 6-8 hours after the inflammatory process has started or tissue damage has been done [4].

Reliable Diagnostics:

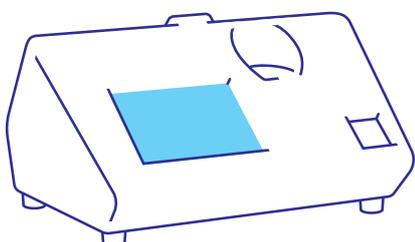
Measurement of SAA is specific and is not affected by environmental facts such as stress. The SAA concentration in the blood only increases due to the presence of an inflammatory stimulus [6].

Quantifiable Diagnostics:

Measurement of SAA is a quantitative result that is directly proportional to the intensity or severity of inflammation or trauma. Under inflammatory conditions, the SAA serum levels can increase 10-100x, providing a large diagnostic window for measurement [5].

Fast Diagnostics:

Measurement of SAA occurs in real-time, meaning if the underlying inflammatory disease is treated successfully, the SAA concentration in the blood will drop significantly within hours (24-48 hrs). Thus, repeated SAA measurements after therapy treatment or surgery will indicate if ongoing antibiotic treatment is working or if there are complications with postoperative recovery [3,5].



When systemic inflammation or infection is present, the SAA concentration in the blood will increase 10-100 times its normal levels. This increase in the blood will be detectable within approximately 6-8 hours after the onset of inflammatory conditions, with the SAA blood concentration peaking around 24-48 hours [4]. Similarly, SAA has a short half-life (approximately 20-24 hrs.), which means once inflammatory conditions have subsided, the SAA concentration in the blood will return quickly to its normal physiological conditions within 48-72 hours [5]. SAA is a sensitive marker for systemic inflammation and infection in cats due to its early and rapid increase in the blood before clinical symptoms, such as fever and increase leukocyte count, present itself [6].

The Feline SAA TurboReader™ Assay

The **TurboReader™** is a compact, user-friendly diagnostic reader which together with single-use reagent cuvettes performs one analysis within minutes. The system can be operated with minimal training and performs tests on serum or plasma. Automatic test results are provided on a touch screen color display with the precision and accuracy comparable to a routine clinical chemistry analyzer found in the central laboratory. **The Feline SAA TurboReader™ Assay** is packed together in a diagnostic kit consisting of ready-to-use cuvettes and has the following assay specifications:

- **Requires 10 µl sample** **serum or Li-heparin plasma**
- **One-step procedure** **30-second handling**
- **Automatic analysis** **9.5 min analysis time**
- **Measures between** **10-300 mg/l SAA**
- **Clinical inflammatory cut-off** **15 mg/l**

How to use the Feline SAA TurboReader™ Assay in clinical practice?

1 Detection:

Detect and quantify the presence of systemic inflammation (infection or trauma) in cats. Any SAA value of >15 mg/l indicates presence of infection. The higher the serum SAA concentration, the greater intensity and severity of the inflammation. The SAA value does not indicate what is causing the systemic inflammation, only that it is present. Thus, a clinical exam must always be conducted and the overall clinical picture must be taken into account when considering treatment options. If the SAA result does not correlate with the clinical picture of the cat, follow-up with the Feline Haptoglobin (Hp) TurboReader™ Assay.

TurboReader™ SAA
> 15 mg/l

YES,
INFECTION PRESENT

TurboReader™ SAA
< 15 mg/l

NO,
INFECTION NOT PRESENT

FELINE INFLAMMATION DIAGNOSTICS

2 Monitoring:

Monitor the efficacy of treatment in real-time and select the best antibiotic treatment. Since the half-life of SAA is around 20-24 hours, the serum SAA levels increase and decrease rapidly in the blood. This means if antibiotic treatment is effective, the SAA serum levels should decrease rapidly within the first 48-72 hours. If not, other treatment options should be considered. Similarly, serum SAA levels should decrease during post-operative recovery. If not, this indicates possible postsurgical complications in the animal.



3 Screening:

The TurboReader™ SAA assay is a screening tool, which allows veterinarians to get ahead of the game. Find inflammation in cats when clinical signs are not present. Animals that are considered at higher risk of developing infections, such as young kittens or adopted animals, run the TurboReader™ SAA to rule out presence of infection.

Classification of Clinical and Subclinical Inflammation [3]:

1 Anemia:

- The SAA level had a higher diagnostic sensitivity than WBC or fever in the diagnosis of inflammatory conditions in cats with anemia [7].

2 Inflammation and Infection:

- **Acute Pancreatitis:** SAA levels are significantly increased in cats with acute pancreatitis compared to healthy cats [8]. SAA levels were monitored in a cat with pancreatitis for 831 days and it was found that SAA levels were increased both at disease onset and with recurrence [9]. SAA was a better marker than WBC for monitoring treatment response and disease exacerbation in feline pancreatitis.
- **Feline Infectious Peritonitis (FIP):** SAA serum levels were persistently increased in cats with FIP. Cats exposed to feline enteric coronavirus (FCoV) only showed transient increases [10].
- SAA levels increased significantly (50 fold over normal levels) in cats with infection and inflammation. No significant changes in SAA levels were observed in cats with endocrine/metabolic or neoplastic diseases [8,11].

3 Surgery Recovery:

- SAA serum concentrations in cats that have undergone surgery, as well as, those hospitalized are significantly elevated. SAA concentrations peak approximately, 24 hours after surgery and already start to decrease 48 hours post-operation. A significant drop in SAA levels are observed by the fourth day after surgery [5].

4 Prognostic Marker:

- Elevated SAA serum concentrations in diseased cats was predictive indicator of prognosis, regardless of original diagnosis [12].
- Median survival time for diseased cats with non-elevated SAA levels was 571 days compared to 72 days for diseased cats with elevated SAA levels.

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