

Decoding Your Pet's Blood Test Results

Your pet's liver plays a critical role in her health, longevity and quality of life. A routine part of regular wellness exams, liver enzyme test values can change from one blood test to the next. How concerned should you be when your pet's ALP, ALT, AST, bilirubin and albumin values rise or fall?

Analysis by Dr. Karen Shaw Becker

STORY AT-A-GLANCE

- Many pet parents are curious or even worried when their furry family member's blood test numbers change from one wellness visit to the next; this is especially true when liver values change, since savvy pet guardians understand the importance of this organ to their pet's health.
- Changes in liver enzyme values are relatively common, and while any abnormal value should be investigated or at least closely watched, there are several variables to consider
- The liver values most commonly measured in animals include ALP (alkaline phosphatase), ALT (alanine transaminase), AST (aspartate transaminase), GGT (gamma-glutamyl transferase), bilirubin, and albumin
- If an animal is showing signs of liver disease and the veterinarian cannot determine why, a definitive diagnosis often requires a biopsy; if your pet is seriously ill and other diagnostic tests return indefinite results, a biopsy may be the only remaining option to ensure your furry family member receives the help he or she needs

Regular veterinary **wellness exams**, including organ function tests, are an important aspect of pet ownership. Today we're looking at just one parameter that bloodwork assesses: liver health. Knowledgeable pet parents are very aware of the critical role the liver plays in their animal's health, longevity, and quality of life, and are naturally concerned, or at least curious, when the numbers change from one blood test to the next.

Changes in liver enzyme values are actually quite common, and elevations in liver enzymes don't automatically indicate organ disease. While any abnormal value should be addressed, there are several factors to consider when reviewing test results. These include which liver values have increased, how much they've increased, and how long the elevation has persisted.

I recommend you ask your veterinarian to go over test results with you in the exam room or ask for a copy of the results and review them at home, adding them to your pet's medical file so you can compare them to future test results.

There are a number of blood serum chemistry values your veterinarian uses to determine the health of your dog's or cat's liver. The values most commonly measured include ALP (alkaline phosphatase), ALT (alanine transaminase), AST (aspartate transaminase), GGT (Gamma-glutamyl transferase), bilirubin and albumin.

Elevations in Alkaline Phosphatase (ALP)

It's not unusual for a young pet's ALP enzyme to be elevated, but unfortunately, many veterinarians assume this marker isn't relevant unless the animal is showing clinical signs. Subtle changes in an animal's biochemistry profile often indicate the animal is slipping away from homeostatic balance, something that should not be overlooked year after year.

The ALP enzyme is produced in several places in the body, including the outer layer of liver cells, in response to stress. An elevated ALP can certainly be an early marker for liver disease, but it can also point to problems outside the liver, because it's not a liver specific enzyme.

For example, within a few hours of ingesting colostrum, puppies and kittens have very high levels of ALP. Growing animals have increased levels of phosphate circulating in the bloodstream as their bones are developing, which results in expected and predictable elevations in ALP. Veterinarians expect to see this in puppies and kittens.

Similarly, later in life, diseases of the bones and endocrine system, including cancer and other disorders, can also increase ALP levels. When certain types of drugs are given, such as glucocorticoids (steroids) or anticonvulsants, a process called "enzyme induction" takes place in the liver. Dogs with hyperadrenocorticism (Cushing's disease) have increased cortisol levels that result in very high ALP levels. This is one clue your dog may have adrenal disease.

So, although ALP is commonly thought of as an indicator of liver disease, there are many other potential sources of elevation to consider. In the vast majority of cases, if ALP elevations are related to liver dysfunction, ALT will also be elevated.

Elevations in Alanine Transaminase (ALT)

If an animal's ALT level is elevated, it should be addressed. ALT is produced inside liver cells and the only way it can reach the bloodstream is through a ruptured cell. So, an elevated ALT value (without elevation in other markers) may indicate rapid death of, or injury to, liver cells.

However, the liver has regenerative powers, so slightly higher than normal rates of cell death, or short periods of significant cell death, may be resolved by the liver's ability to regenerate tissue. As a general rule, veterinarians consider that ALT values two to three times above normal warrant further investigation, while lower elevations in a clinically normal animal can be closely monitored through regular rechecks and a liver-supportive protocol.

Also, ALT is present in intestinal as well as liver cells, so a serious gastrointestinal (GI) disease can cause mild elevations in this enzyme.

Elevations in AST and GGT

AST (aspartate transaminase) is a more sensitive marker, but less specific than ALT for identifying liver disease. AST is found not only in the liver, but also in the skeletal and cardiac muscles, so it's important to investigate the source of any elevation in this enzyme.

GGT (gamma-glutamyl transferase), is an enzyme found in various tissues in the body, including the liver. It plays a role in the metabolism of glutathione, an important internal antioxidant, as well as in the transfer of amino acids across cell membranes. GGT is commonly measured in blood tests as one marker of liver function and health. Elevated levels of GGT in the blood can indicate potential issues with the liver, bile ducts, or other parts of the body.

Elevations in Bilirubin

An elevation in a pet's bilirubin level may be a sign that several significant and life-threatening issues could be occurring, including liver or obstructive gallbladder disease. If the animal is sick, immediate diagnosis and treatment is required. Bilirubin is a pigment released when red blood cells die off. In a healthy animal, bilirubin is produced continuously as old blood cells are replaced with new ones, and the liver is able to clear the waste pigments.

In some animals with normal liver function, bilirubin may be elevated by a disease that causes rapid destruction of red blood cells. While the liver may be healthy, the gallbladder may be in crisis, or a disease causing the death of red blood cells (including autoimmune issues, heavy metal accumulation, toxins, parasites, or infectious disease) should be immediately investigated, diagnosed, and treated.

Low Levels of Albumin

A low albumin level in a dog or cat can also signal liver failure. Albumin is a blood protein produced by the liver, and a low level can also point to potential **kidney disease**, malabsorption of nutrients from food, intestinal disease, or inadequate nutrition. Low albumin should be investigated, especially in pets who appear well nourished.

Diagnosing Liver Disease

The liver has tremendous regenerative capacity and the ability to adequately function even when it is "sick," so an elevated blood ALT or AST level does not necessarily correlate to the relative "sickness" of the liver. That's why these values, while important, don't give a complete picture of the health of the organ. In fact, ALT and AST elevations can be quite minor in animals with end-stage liver disease.

In light of this, it's important to never rely on a single ALT, AST, or GGT value to arrive at a definitive diagnosis or prognosis. Increased liver enzymes should be rechecked regularly, at least monthly in asymptomatic animals, along with other markers of liver disease and liver function.

Since a definitive diagnosis of liver disease often requires a biopsy, many veterinarians faced with abnormal liver values first try to rule out other environmental causes that might contribute to the abnormal values, including food contaminants (mycotoxins), and chemical and heavy metal exposure (including flea/tick pesticides and excessive amounts of copper added to ultraprocessed pet foods).

Abnormal liver enzymes signal there is liver damage occurring, but they aren't a measure of liver function or health. The two-part blood test that measures liver function is called a Bile Acids Test, and it is the test I recommend if liver enzymes continue to climb, or if the patient is symptomatic.

If all other potential conditions are eliminated, the next step is typically to do an ultrasound exam of the liver, the gallbladder, and surrounding tissues.

If your pet is seriously ill and/or other diagnostic tests return ambiguous results, unfortunately, a liver biopsy may be the only remaining option to accurately diagnose your four-legged family member's condition and evaluate available treatment options. I always try to avoid this invasive procedure, if possible, but sometimes it's the only way to diagnose certain liver diseases.

Recheck. Recheck. Recheck!

If your pet isn't showing any signs of illness and mildly elevated liver enzymes are identified on routine bloodwork, your vet may suggest offering a means of liver detoxification, including milk thistle, SAMe, phosphatidyl choline, NAC (N-acetyl cysteine) and SOD (superoxide dismutase). Hopefully, he or she will also address potential external causes of liver stress, including air, water and food contaminants, environmental chemical and toxin loads, infectious diseases, unnecessary **vaccine stress**, and parasite infestations. Sometimes a temporary liver detox diet and supplement protocol can normalize liver enzymes.

If your pet has no symptoms of disease and you opt to provide a holistic liver support protocol, rechecking liver enzymes to ensure they've returned to normal is important for your peace of mind and to identify progressive liver disease before a crisis occurs.

If your pet is ill, identifying the root cause (including infectious disease, metal accumulation, degenerative, inflammatory, or immune-mediated disease, or a congenital/structural problem) will allow your veterinarian to formulate the best treatment protocol as early as possible, giving your furry friend the best chance for a speedy recovery and a good quality of life.
