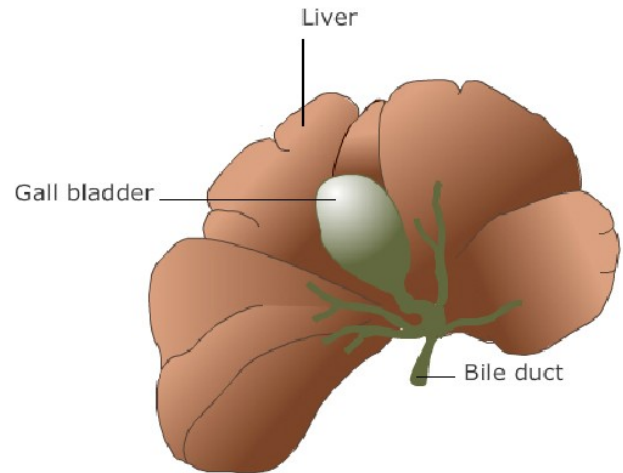


## Serum Bile Acids

### What is the purpose of the bile acid test?

The bile acid test is performed to determine if the liver is working properly. Specifically, the test determines if the liver has enough healthy cells to do the job, and if there is a good blood supply to the organ. If the liver has enough healthy cells, it is described as having "*adequate functional mass*". The bile acid test is based on the principle that a healthy liver, with adequate functional mass and a good blood supply, can "recycle" bile acids, while a damaged or defective liver cannot.

Bile acid testing may be recommended for pets that have elevated liver enzymes or low albumin levels, since these suggest underlying liver disease. The bile acid test is useful to detect congenital liver defects in very young pets that are not growing well. It is also an essential test for any pet that has had a seizure, since liver disease may be the root cause of some seizure disorders.



### Where do bile acids come from and what do they do?

"Bile acids are made in the liver and stored in the gall bladder."

Bile acids are made in the liver and stored in the gall bladder. Bile acids help with digestion, and are particularly important in the digestion of fat. When food is eaten, the body sends a signal to the gall bladder, causing the gall bladder to contract and push bile acids out into the small intestine. The bile acids mix with the food, and break down large complex fats into small simple fat particles that are more easily absorbed.

### How does the liver \"recycle\" bile acids?

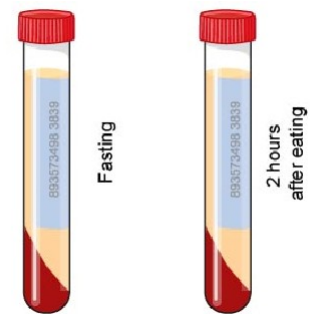
When digestion is complete, the bile acids are absorbed from the intestine, and are carried in the blood stream back to the liver. The liver retrieves the bile acids from the blood stream, and returns them to the gall bladder, where they are stored until the next meal.

## Is there special preparation for the test?

Before starting the test, the pet must be completely fasted (all food withheld) for at least 12 hours. The fasting period gives the liver time to retrieve any bile acids remaining in the blood stream, so that there are no bile acids, or only very low levels of bile acids in the blood stream at the beginning of the test. The fast is an important part of the protocol, and must be observed closely. Even treats and chew toys must be withheld.

## How is the test performed?

The test begins by collecting a preliminary blood sample, called the *resting sample*. A small meal of canned food is then offered to the fasted pet. The pet is usually hungry, and eats the food eagerly. Exactly 2 hours after the meal is finished, a second blood sample is collected. Both blood samples are tested for levels of bile acids.



## How important is it to follow the protocol closely?

"The protocol for the bile acid test is simple, but it must be followed precisely."

The protocol for the bile acid test is simple, but it must be followed precisely. Errors such as failing to fast the pet properly, feeding too large a test meal, or collecting blood samples at the wrong time, may affect the validity of the test results.

The bile acid test should not be used in pets that have stomach or intestinal problems such as vomiting, diarrhea, or blockage, since these problems may interfere with digestion of the test meal or alter the rate at which bile acids are recycled. The bile acid test should not be used in pets that have had previous surgery to remove a section of their small intestine, since these patients may not be able to re-absorb and recycle bile acids properly.

## How is the test interpreted?

If the liver is working adequately, a properly fasted pet should have very low levels of bile acids in the resting blood sample and only slightly higher levels of bile acids after the meal. This indicates that those bile acids released from the gall bladder during the test meal were adequately re-captured by the liver in the 2-hour period following the meal. If the level of bile acids after the meal is within acceptable limits, then the liver is considered to have adequate functional mass and blood supply.

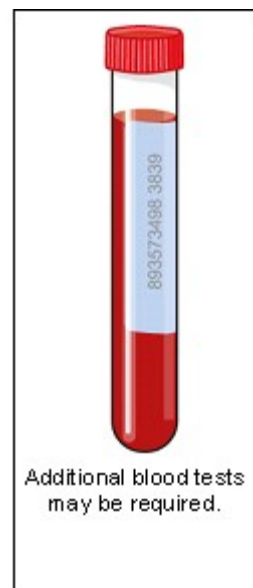
## If the bile acid test is normal, does it always mean the liver is completely healthy?

Sometimes the bile acid test results will be normal, even when there is a problem in the liver. This usually occurs when the problem is mild or affects only a small portion of the liver. In these situations, there is often no reduction in the overall ability of the liver to do its job, and the bile acid test will be normal, even though the pet has elevated liver enzyme values.

If the veterinarian suspects that your pet has liver disease in spite of normal bile acid test results, additional diagnostic tests may be recommended to investigate the problem further.

## If the bile acid test is abnormal, what then?

An abnormal bile acid test result indicates there is a problem in the liver, but does not provide information about the cause, severity, or reversibility of the problem. Depending on how sick the pet is and how abnormal the test results are, your veterinarian may recommend monitoring the situation, or may suggest additional diagnostic tests.



*This client information sheet is based on material written by: Kristiina Ruotsalo, DVM, DVSc, Dip ACVP & Margo S. Tant BSc, DVM, DVSc*

*© Copyright 2009 Lifelearn Inc. Used and/or modified with permission under license.*