

UNDERSTANDING BLOOD WORK: THE BIOCHEMICAL PROFILE

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BIOCHEMICAL PROFILE

Blood work is a very important diagnostic tool that provides a significant amount of information about your pet's health. A biochemical profile is a blood test that assesses the function of internal organs, measures the electrolytes such as blood potassium, and identifies the levels of circulating enzymes. Understanding the biochemical profile can be difficult but reveals a wealth of information.

SAMPLE

Twenty of the most common tests are listed. Normal values are listed in parentheses and vary from lab to lab and those listed should not be considered universal.

Glucose.....	117 mcg/dl...	(80-120)
BUN (blood urea nitrogen).....	24 mg/dl...	(8-29)
Creatinine.....	0.8 mg/dl...	(0.4-1.2)
Sodium (Na).....	140 mEq/l...	(139-164)
Potassium (K).....	5.2 mEq/l...	(4.4-6.1)
Chloride.....	104 mEq/l...	(10-118)
CO ₂ (carbon dioxide).....	22 mEq/l...	(22-285)
Calcium.....	9.6 mg/dl...	(9.4-11.6)
Phosphorus.....	5.6 mg/dl...	(2.5-6.2)
Total Protein (TP).....	6.3 gm/dl...	(5.8-8.1)
Albumin.....	2.9 gm/dl...	(2.6-4)
Bilirubin.....	0.6 mg/dl...	(0.2-0.7)
Cholesterol.....	204 mg/dl...	(129-330)
Triglyceride.....	82 mg/dl...	(36-135)
ALKP (alkaline phosphatase).....	65 U/l...	(20-70)
AST (aspartate aminotransferase).....	30 U/l...	(14-42)
ALT (alanine aminotransferase).....	45 U/l...	(15-52)
GGT (gamma-glutamyl transferase).....	5 U/l...	(1-12)
Amylase.....	850 U/l...	(280-950)
CK (creatinine kinase).....	47 U/l...	(0-130)

WHAT DOES IT ALL MEAN?

Glucose is the end product of carbohydrate metabolism and is the primary source of energy for the body. High levels indicate stress, Cushing's disease, diabetes, pancreatitis or can be due to certain medications. Low levels can indicate liver disease, insulin overdose, severe bacterial infection, hypothyroidism and Addison's disease. Toy breed puppies are prone to low blood glucose for unknown reasons.

BUN stands for blood urea nitrogen and is the primary end product of protein metabolism. High levels indicate kidney failure or disease, dehydration, shock, high protein diet, certain toxin ingestions, poor circulation to the kidneys and urinary obstruction. Low levels indicate liver disease or starvation.

Creatinine is the end product of phosphocreatine metabolism, which is important in muscle contractions.

High levels indicate kidney failure or disease, dehydration, shock, certain toxin ingestions, poor circulation to the kidneys and urinary obstruction. Low levels indicate liver disease or starvation.

Sodium works in combination with potassium and is very important in maintaining normal function of muscle and nerves. It is also an important electrolyte in every part of the body. High levels indicate dehydration, lack of water, diabetes insipidus, Cushing's and excess salt intake. Low levels indicate starvation, severe diarrhea, vomiting, Addison's disease, hypothyroidism and metabolic acidosis.

Potassium works in combination with sodium and is very important in maintaining normal function of muscle and nerves. High levels indicate diabetes, certain toxin ingestions, urinary obstruction, acute kidney failure, severe muscle damage and Addison's disease. Low levels indicate vomiting and diarrhea, gastrointestinal cancer, insulin overdose, Cushing's disease, overuse of diuretics and starvation.

Chloride is important in maintaining the acid balance in the blood as well as combining with hydrogen to form hydrochloric acid for stomach digestion. High levels indicate dehydration, metabolic acidosis, Addison's disease and kidney disease. Low levels indicate vomiting and metabolic alkalosis.

CO₂ indicates the current acid balance of the body and is the end product of metabolism. High levels indicate an acidic condition and can be due to kidney failure, vomiting, dehydration or overuse of diuretics. Low levels indicate a basic condition of the blood and can be due to starvation, kidney failure (can also cause acidosis), diarrhea and poor liver function.

Calcium is a mineral found throughout the body. It is the basis for bones, teeth and muscle contractions. High levels indicate certain forms of cancer, Addison's disease, excess intake of vitamin D and an overactive parathyroid gland. Low levels indicate eclampsia, severe pancreatitis, dietary imbalance, intestinal absorption disorders, low intact of vitamin D, Cushing's disease and certain toxin ingestions.

Phosphorus is often associated with calcium. It is important in all aspects of metabolism. High levels indicate kidney disease, dietary imbalance, excess ingestion of vitamin D and severe tissue trauma. Low levels indicate dietary imbalance, certain cancers, overdose of insulin, diabetes, eclampsia and an overactive parathyroid gland.

Total Protein (TP) is an important substance in all parts of the body. High levels indicate dehydration, inflammation, chronic infection and certain cancers. Low levels indicate intestinal absorption problems, liver disease, Addison's disease, severe burns and losses through the kidneys.

Albumin is the major protein found in the body. It carries various substances through the blood and is important in maintaining pressure within the vessels. High levels indicate dehydration. Low levels indicate chronic inflammation, liver disease, kidney disease, starvation and blood loss.

Bilirubin is a bile pigment and is the end product of red blood cell breakdown. High levels typically result in jaundice and can be due to bile duct obstruction, gall bladder obstruction, liver disease and rapid breakdown of red blood cells. Low levels are not considered clinically relevant.

Cholesterol is important in the synthesis of certain hormones. High levels are not as important as in people. Low levels indicate liver disease, starvation, kidney disease, Cushing's, pancreatitis, diabetes and hypothyroidism.

Triglyceride is important in storing fat and releasing fatty acids. High levels have been associated with seizures in schnauzers. Low levels indicate starvation or malnutrition.

ALKP is important in metabolism and is found in liver cells. High levels indicate bile duct obstruction, Cushing's, liver disease, certain cancers and may be due to certain drugs such as steroids or phenobarbital. Low levels indicate starvation or malnutrition.

AST is important in the breakdown and elimination of nitrogen. High levels indicate muscle damage, heart muscle damage, liver damage, toxin ingestion, inflammation and various metabolic disorders. Low levels indicate starvation or malnutrition.

ALT is also important in the metabolism of nitrogen and is most often associated with the liver. High levels indicate liver damage, toxin ingestion, Cushing's disease and various metabolic disorders. Low levels indicate starvation or malnutrition.

GGT is also important in nitrogen metabolism and is found within liver cells. High levels indicate bile duct obstruction, liver disease, pancreatitis, Cushing's and can be caused by high levels of steroids. Low levels indicate starvation and malnutrition.

Amylase is secreted by the pancreas and is important in normal digestion of starch. High levels indicate pancreatic inflammation or cancer, kidney disease, prostatic inflammation, diabetic ketoacidosis and liver cancer. Low levels can indicate malnutrition or starvation.

CK is very important in storing energy needed for muscle contractions. High levels indicate muscle trauma or damage such as due to seizures, surgery, bruises, inflammation, nutritional and degenerative diseases. Low levels are not clinically relevant.