

Amino Acids

<i>Essential</i>	<i>Functions</i>	<i>Deficiency Symptoms</i>	<i>Food Sources</i>
Histidine	Red cell production, involved in protein formation and metabolic activity.	Eczema, joint stiffness, muscle pain.	Beef, lamb, cheese, pork, chicken, turkey, soy, fish, nuts, seeds, eggs, beans, and whole grains.
Isoleucine	BCAA. Energy in muscles, aids in recovery, hemoglobin production.	Dizziness, fatigue, headaches, confusion, irritability, and depression.	Pork, beef, chicken, cheese, wheat germ, legumes, seeds.
Leucine	BCAA. Energy and endurance, maintains blood sugar, and human growth hormone.	Headaches, fatigue, irritability, confusion.	Seeds, pork, beef, chicken, cheese, fish, beans.
Lysine	Builds immunity, protein synthesis, aids in digestion, helps calcium absorption.	Anemia, bloodshot eyes, fever blisters, hair loss, apathy.	Eggs, beans, lentils, beef, chicken, fish, cheese.
Methionine	Precursor to creatine, increases anti-oxidants, reduce cholesterol, liver cleanse.	High cholesterol, liver damage, oxidative damage to cells.	Meat, eggs, dairy, seeds, legumes.
Phenylalanine	Enhances memory, learning, mood, alertness, collagen, suppresses appetite.	Depression, vitilago (skin disorder), ADHD.	Chicken, fish, meat, eggs, cheese, dairy.
Threonine	Detoxifier of liver, builds collagen, bone, connective tissue.	Neurological dysfunction, skin disorders, muscle or skeletal weakness.	Beef, pork, soy, fish, cottage cheese, eggs.
Tryptophan	Precursor to serotonin = sleep/calming, stimulates growth hormone.	Insomnia, depression, anxiety, PMS.	Cheese, turkey, chicken, nuts, seeds, oats, beans, lentils, red meat, eggs.
Valine	BCAA. Muscle metabolism, tissue repair, energy source, balances nitrogen.	Inability to absorb proteins, mental instability, insomnia.	Cheese, beef, lamb, nuts, seeds, mushrooms, pork.

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<i>Conditionally Essential</i>	<i>Functions</i>	<i>Deficiency Symptoms</i>	<i>Food Sources</i>
Arginine	Increases insulin, growth hormones, collagen and stimulates immune system.	Hair loss, poor wound healing, skin rash.	Beef, chicken, fish, nuts, whole grains.
Cysteine	Building block for glutathione, fights oxidative stress to brain and lungs.	Apathy, fluid retention, lethargy, weakness.	Chicken, turkey, duck, yogurt, eggs, sunflower seeds nuts.
Glutamine	Immune system function, supports kidney and GI tract, memory & focus.	Anxiety, sugar cravings, constipation, weak wound healing, mood swings.	Meats, nuts, seeds, eggs, asparagus, cabbage.
Glycine	Builds muscle mass, memory & cognitive thinking, increases glutathione productions.	Muscle pain, insomnia, headaches.	Green leafy veggies, cauliflower, pumpkin, bananas, meat, poultry, eggs and fish.
Proline	Forms connective tissue & heart muscle, strengthens joints, aids in collagen.	None known, but strict vegetarians and those with eating disorder could be at risk.	Cheese, poultry, tuna, fish, soybeans.
Tyrosine	Important for glandular systems, reduces body fat, appetite, and stress.	Low blood pressure, low body temperature and restless leg syndrome.	Cheese, fish, pork, poultry, soybeans.

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<i>Non-Essential</i>	<i>Functions</i>	<i>Deficiency Symptoms</i>	<i>Food Sources</i>
Alanine	Maintains and converts glucose into energy, removes toxins from liver.	None known, but strict vegetarians and those with eating disorder could be at risk.	Turkey, fish, poultry, egg whites, seaweed.
Asparagine	Synthesizes proteins, helps maintain equilibrium, supports liver cleansing.	Poor metabolism, depression, headaches.	Beef, chicken, dairy, seafood, asparagus, soy, eggs.
Aspartic Acid	Energy production, stimulates synapses in central nervous system (brain/spine).	Fatigue, depression.	Beef, clams, bacon, seafood, poultry, cheese.
Glutamic Acid	Metabolizes sugar & fats, stimulates over 70% of brain synapses.	None known, but strict vegetarians and those with eating disorder could be at risk.	Seafood, cheese, beef, veal.
Serine	Metabolizes fat, produces antibodies & immunoglobins -fights disease & toxins.	Fatigue, confusion, depression, anxiety.	Soybeans, fish, cheese, beef, poultry.