

Health-Full Eating & Nutrition



Amino Acids – The Building Blocks of Life

Protein is an essential macronutrient that has many functions, such as being a structural component for body tissues, carrying oxygen in our blood and plays a role in cell repair. Similar to a house made of bricks, proteins are made up of tiny building blocks called amino acids. Without amino acids, we cannot exist.

The body uses amino acids to make proteins to help the body:

- Break down food
- Grow
- Build and repair body tissues
- Used as a source of energy

Amino acids can be broken up into three classifications, essential amino acids, nonessential amino acids and conditional amino acids.

Essential Amino Acids

Essential amino acids cannot be made by the body and must be acquired through daily food intake. This classification includes nine amino acids: histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan and valine. If a food contains all nine of the essential amino acids, the food is considered “complete”.

Complete Protein Examples

- Fish
- Poultry
- Eggs
- Beef
- Pork
- Dairy
- Whole sources of soy (tofu, edamame, tempeh and miso)



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Many foods contain some, but not all, of the essential amino acids and are considered to be “incomplete” proteins.

Incomplete Protein Examples

- Legumes such as beans, peas and lentil
- Nuts
- Seeds
- Whole grains
- Vegetables

If you follow a plant-based diet, you can combine two incomplete vegetable proteins to create a complete protein. For example, see the table to the right.

Food	Limited Amino Acid	Complement
Beans	Methionine	Grains, nuts, seeds
Grains	Lysine, Threonine	Legumes
Nuts/Seeds	Lysine	Legumes
Vegetables	Methionine	Grains, nuts, seeds
Corn	Tryptophan, Lysine	Legume

Nonessential Amino Acids

Some amino acids are produced naturally by our body, and we do not depend on acquiring these through diet. Although termed “nonessential”, these amino acids still play an essential role in supporting several important functions. Non-essential amino acids include alanine, arginine, asparagine, aspartic acids, cysteine, glutamic acid, glycine, proline, serine and tyrosine.

Conditional Amino Acids

During times of stress or illness, our body may experience difficulty producing nonessential amino acids and we may then need to acquire those through foods. The nonessential amino acids considered conditional are arginine, cysteine, glutamine, tyrosine, glycine, ornithine, proline and serine.

Getting enough protein is important to form muscle, transport nutrients, and build and repair tissue. If you are eating a healthy diet, you are most likely getting enough amino acids. Incorporate a variety of protein-containing foods into your diet in order to provide your body with the balanced nutrition that it needs.

References:

- <https://health.clevelandclinic.org/do-i-need-to-worry-about-eating-complete-proteins/>
- <https://medlineplus.gov/ency/article/002222.htm#:~:text=The%20%20essential%20amino%20acids,threonine%2C%20tryptophan%2C%20and%20valine>
- <https://nutrition.org/protein-complementation/>