

Essential Amino Acids

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What are Amino Acids?

Amino acids are the building blocks of proteins. Most proteins in our diet consist of long chains consisting of more than one hundred different amino acids. In the acidic environment of our stomach, the enzyme pepsin assists in splitting long chain proteins into smaller chains called polypeptides. At this stage the polypeptides cannot be absorbed by the intestine and further digestion occurs in the intestine (process called hydrolysis). Now the enzymes trypsin and chymotrypsin, split the shorter chains into individual amino acids. This occurs in a base medium (higher ph) of the intestine and thus make it possible for the individual amino acids to be absorbed. So only hydrolysed, single amino acids can enter the bloodstream through the intestinal wall.

Protein metabolism

It has been an assumption for quite a long time, that proteins produce mainly energy. So, we learned that 1 gram of protein releases 4 kcal of energy. Since then science has recently discovered that there is an anabolic and a catabolic pathway for protein digestion. Via the anabolic pathway, the amino acids are used only for protein synthesis in the cells, which releases no energy and these amino acids are therefore free of calories. Via the catabolic pathway, proteins are "burned", thereby releasing energy and also a considerable amount of nitrogenous waste. This nitrogenous waste (ammonia) must be degraded in the liver and excreted via the kidneys, which places a significant strain on both of these organs.



The Difference between essential and non-essential amino acids

Essential amino acids are those that the body cannot build itself but is dependent on the supply of food to receive the correct building blocks. Non-essential amino acids the body can produce but the source is still the food we eat. Our food thus supplies the building blocks for the body to build these non-essential amino acids, as and when required. It has long been thought that arginine and histidine (and others) are semi-essential amino acids; i.e. the body can produce them, but with advancing age this ability diminishes. Today, these amino acids are also considered non-essential, because the body either produces amino acids or not and nothing in between. Thus, the body can produce arginine and histidine from essential amino acids.



List of Essential Amino Acids

The Essential Amino Acids are:

Leucine, valine, isoleucine, lysine, phenylalanine, threonine, methionine and tryptophan.

List of non-essential Amino Acids

Non-essential Amino Acids are: Alanine, arginine, asparagine, aspartic acid, cysteine, glycine, glutamine, glutamic acid, serine, tyrosine, proline.

Nitrogenous waste

During the combustion of amino acids in the body (catabolic metabolic process) a considerable amount of so-called nitrogen waste (90% ammonia, 10% uric acid) is always produced. Both these waste products put strain on the intestine, liver and kidneys. Most vegetarians and vegans rely on soy as a protein source and athletes rely mostly on whey. Fitness centres sell huge amounts of whey protein products used for muscle building. Let us look at the proportion of nitrogen waste in common foodstuffs:

Chicken	52%
Meat, fish	64-72%
Soybean	83%
Whey	84%
Essential amino acids, hydrolysed, from legumes	2%

Nitrogen free

A food supplement of essential amino acids is therefore a natural food, obtained from legumes, with the amino acids already split and ready for absorption, free of calories and practically free of nitrogen waste.



Higher Requirement

There are groups of people with certain conditions, who have a higher requirement for essential amino acids, such as vegetarians, vegans, children and adolescents, pregnant women, seniors, overweight people, athletes and those suffering from stress.

Indications for additional intake of essential amino acids:

Immunodeficiency
Iron deficiency anaemia
Diabetes Type 2
Gestational diabetes
Renal insufficiency
Hepatic diseases
Digestive problems
Heart problems
Anorexia and malnutrition
Cachexia (end stage of cancer, AIDS etc.)
Obesity
Osteoporosis (together with vitamin D, vitamin K2 and magnesium)
Food allergies
Multiple Sclerosis
And faster healing of bone fractures



Dosage

Essential amino acids are presented in the market as food supplements or diet foods. The easiest way is to consume these in tablet form.

IMPORTANT: The individual amino acids must be hydrolysed. Then Only can they be absorbed by the body in less than 30 minutes and should not trigger allergies! Consult the manufacturer if you have any questions or queries.

It is recommended to take around 5 grams of amino acids with water in the morning or 30 minutes before physical excursion (Sport etc.) The recommended maximum dosage is 10 grams per day.

Side effects

There are no known side effects because these are essentially food. The maximum dosage per day is 35 grams, this would correspond to a beef steak of approximately 200 grams. It would not hurt to take more but is just a waste of money from a dietary point of view. Normal proteins can trigger allergies or intolerances, but this does not happen with a product of hydrolysed amino acids.