What are essential amino acids?

Most of the human body consists of protein. Much of this protein comes from the foods we consume. This can be from plants—vegetables, beans, nuts, and seeds—or from animals in the form of eggs, meat, fish and poultry. Proteins are comprised of amino acids which are known as the body’s “building blocks”. Imagine these amino acids in a long chain, similar in structure to a string of pearls. The protein chain is broken down by the process of digestion, into single amino acids which are then absorbed, across the gut membrane, into the blood system. They are then used to make new amino-acid combinations. There are 28 known amino acids. Of these, 19 are called “non-essential” because the body can manufacture them. These are used, by the liver, to make 80% of the protein structures required by the body. There are 9 other amino acids that cannot be made in the body. We must obtain these from our diet. They are called the “essential” amino acids. They are: histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine.

Why are amino acids important and what role do they play in the body?

Amino acids are central to virtually every function of the human body. They are used in structures and in metabolic reactions for the body’s optimal functioning. Protein and amino acids are used by the body for growth and development, making tissues such as muscle, skin, nails, and hair. They are also used in making hormones and antibodies. We use amino acids for chromosomes, which contain our genetic code. We also use them for neurotransmitter production, cell growth, reproduction and repair. Proteins are essential for glandular function and for detoxification. Amino acids can also be used for the manufacture of energy and enzymes (molecules involved in speeding up reactions). Any amino acid excess is stored by the body, as glycogen, for future use. Amino acids also help to regulate water balance and the body’s pH (acid/base balance).

What amount of amino acids do you need each day?

There are no specific guidelines for the amount of amino acids required by the body on a daily basis however amino acid supplements are considered safe at levels up to 6,000mg per day. An optimal intake any individual amino acid is 1,000mg. Some essential amino acids may interact with particular conditions or symptoms. Since this is so it is advisable to seek advice from your health care practitioner, regarding intake requirements.
What are possible essential amino acid deficiency conditions and symptoms?

Each essential amino acid is listed below.

**Histidine Essential Amino Acid (EAA) Deficiency Conditions and Symptoms**
- Low amounts of stomach acid and indigestion
- Wilson’s disease
- Rheumatoid arthritis

**Threonine (EAA) Deficiency Conditions and Symptoms**
- Poor immune function
- Dyspraxia
- Depression
- Muscle spasms
- Multiple Sclerosis

**Methionine (EAA) Deficiency Conditions and Symptoms**
- Pain
- Morning stiffness
- Hyperadrenia
- Low stomach acid
- Mental illness
- Chemical allergies
- Degenerative disease
- High Homocysteine
- High cholesterol
- Osteoporosis
- Heart Disease
- Cardiovascular disease
- Alzheimer’s disease
- Depression
- High Histamine
- Parkinson’s disease
- Schizophrenia
- Osteoarthritis
- Chronic Fatigue Syndrome
- Liver disease

**Lysine (EAA) Deficiency Conditions and Symptoms**
- Osteoporosis
- Herpes
- Viral infection
- Atherosclerosis
- Hormonal imbalance
- Low Pipecolic acid (Neurotransmitter)
- Low Calcium level

**Phenylalanine (EAA) Deficiency Conditions and Symptoms**
- Excessive appetite
- Depression
- Hypothyroidism
- Rheumatoid arthritis
- Low back pain
- Vitiligo

**Tryptophan (EAA) Deficiency Conditions and Symptoms**
- Schizophrenia
- Insomnia
- Constipation
- Anxiety
- Suicidal thoughts
- Depression
- Food cravings
- Aggression
- Hypoadrenia
- Hypersensitivities to light, sound and pain
- Multiple Sclerosis
- Obesity
- Pre Menstrual Syndrome
- Autism
- ADHD
- ADD
- Parkinson’s disease
### Isoleucine-Essential Branch Chain Amino Acid (EBCAA) Deficiency Conditions and Symptoms
- Poor muscle tone
- Poor muscle growth
- Muscle loss
- Diabetes
- Chronic Fatigue Syndrome
- Poor collagen formation

### Leucine (EBCAA) Deficiency Conditions and Symptoms
- Weak ligaments
- Slow wound healing
- Diabetes
- Muscle loss
- Chronic Fatigue Syndrome
- Poor muscle tone
- Poor muscle growth

### Valine (EBCAA) Deficiency Conditions and Symptoms
- Poor collagen formation
- Poor muscle tone
- Poor muscle growth
- Muscle loss
- Chronic fatigue Syndrome
- Liver Cirrhosis

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### What are possible essential amino acid excess symptoms?

#### Histidine:
- Supplements should be avoided with heavy menstrual bleeding, clinical depression or schizophrenia as they are all linked with elevated histidine levels.

#### Methionine:
- Supplements as SaMe (S-Adenosyl-Methionine) may cause digestive discomfort, nausea and vomiting.

#### Lysine:
- Supplements may cause increased triglyceride and cholesterol levels.

#### Phenylalanine:
- Supplements may cause anxiety, headaches and high blood pressure. This must be avoided in Phenylketonuria.

#### Tryptophan:
- Supplements may cause nausea and diarrhea.

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### What steals amino acids from the body?

#### Antacid H-2-Receptor Antagonists:
- Cimetidine (Tagamet), Famotidine (Pepcid), Nizatidine (Axid) and Ranitidine (Zantac)

#### Antacid Proton Pump Inhibitors:
- Omeprazole (Prilosec), Lansoprazole (Prevacid) and Rabeprazole (Aciphex)

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### What tests can be used to assess amino acid levels?

- Amino acid levels in fasting blood plasma
- Blood spot analysis
- Urinary levels of each essential amino acid
What foods contain the highest amounts of Essential Amino Acids?

TOP 10 HISTIDINE RICH FOODS ARE:

1. Pork
   740mg/100g

2. Chicken
   660mg/100g

3. Sunflower seeds
   630mg/100g

4. Peanuts
   600mg/100g

5. Almonds
   590mg/100g

6. Salmon
   590mg/100g

7. Beef
   560mg/100g

8. Herring
   530mg/100g

9. Brazil nuts
   400mg/100g

10. Eggs
    300mg/100g
What foods contain the highest amounts of Essential Amino Acids?

TOP 10 THREONINE RICH FOODS ARE:

1. **Sunflower seeds**
   930mg/100g

2. **Chicken**
   900mg/100g

3. **Salmon**
   870mg/100g

4. **Pork**
   860mg/100g

5. **Peanuts**
   810mg/100g

6. **Herring**
   790mg/100g

7. **Beef**
   740mg/100g

8. **Almonds**
   680mg/100g

9. **Walnuts**
   600mg/100g

10. **Eggs**
    600mg/100g
What foods contain the highest amounts of Essential Amino Acids?

**TOP 10 METHIONINE RICH FOODS ARE:**

1. Brazil nuts
   1,010mg/100g

2. Chicken
   590mg/100g

3. Salmon
   590mg/100g

4. Sunflower seeds
   490mg/100g

5. Pork
   490mg/100g

6. Beef
   410mg/100g

7. Eggs
   390mg/100g

8. Peanuts
   290mg/100g

9. Walnuts
   240mg/100g

10. Almonds
    190mg/100g
What foods contain the highest amounts of Essential Amino Acids?

TOP 10 LYSINE RICH FOODS ARE:

1. Salmon
   1,830 mg/100g

2. Chicken
   1,820 mg/100g

3. Beef
   1,480 mg/100g

4. Sunflower seeds
   940 mg/100g

5. Peanuts
   850 mg/100g

6. Lentils (boiled)
   630 mg/100g

7. Almonds
   600 mg/100g

8. Brazil nuts
   540 mg/100g

9. Tofu
   530 mg/100g

10. Butter beans
    520 mg/100g
What foods contain the highest amounts of Essential Amino Acids?

TOP 10 PHENYLALANINE RICH FOODS ARE:

1. Peanuts
   1,230mg/100g

2. Sunflower seeds
   1,170mg/100g

3. Almonds
   1,150mg/100g

4. Chicken
   850mg/100g

5. Salmon
   780mg/100g

6. Pork
   750mg/100g

7. Brazil nuts
   750mg/100g

8. Walnuts
   710mg/100g

9. Beef
   670mg/100g

10. Eggs
    670mg/100g
What foods contain the highest amounts of Essential Amino Acids?

**TOP 10 TRYPTOPHAN RICH FOODS ARE:**

1. **Sunflower seeds**
   - 350mg/100g
2. **Brazil nuts**
   - 260mg/100g
3. **Chicken**
   - 250mg/100g
4. **Turkey**
   - 250mg/100g
5. **Pork**
   - 230mg/100g
6. **Peanuts**
   - 230mg/100g
7. **Salmon**
   - 220mg/100g
8. **Beef**
   - 220mg/100g
9. **Almonds**
   - 190mg/100g
10. **Eggs**
    - 150mg/100g
What foods contain the highest amounts of Essential Amino Acids?

TOP 10 Isoleucine Rich Foods Are:

1. Sunflower seeds
   1,140mg/100g
2. Chicken
   1,130mg/100g
3. Salmon
   920mg/100g
4. Pork
   870mg/100g
5. Peanuts
   830mg/100g
6. Beef
   760mg/100g
7. Eggs
   690mg/100g
8. Almonds
   690mg/100g
9. Walnuts
   630mg/100g
10. Brazil nuts
    600mg/100g
What foods contain the highest amounts of Essential Amino Acids?

TOP 10 LEUCINE RICH FOODS ARE:

1. Salmon  
   1,620mg/100g

2. Chicken  
   1,610mg/100g

3. Peanuts  
   1,540mg/100g

4. Pork     
   1,510mg/100g

5. Almonds  
   1,470mg/100g

6. Beef     
   1,420mg/100g

7. Brazil nuts  
   1,190mg/100g

8. Walnuts  
   1,170mg/100g

9. Eggs     
   1,080mg/100g

10. Lentils (boiled)  
    650mg/100g
Individual amino acids should not be consumed for prolonged periods.

There are many nutritional amino acid products on the market. They are sold as separate amino acids or as combinations of amino acids. They commonly occur in two isomer forms (arrangements) known as “D” or dextro and “L” or levo forms. D forms are rarely found in nature and should be avoided as they are not well utilized.

It is recommended that amino acid supplements are taken on an empty stomach, so as to avoid competing with amino acids in food. It has been suggested that amino acids should be taken with Vitamin B6 and Vitamin C to enhance absorption.
What are the very best Essential Amino Acid products to buy?

**Klaire Amino Acid Complete**
Comprehensive formula. A comprehensive, well-balanced, and hypoallergenic formulation, Amino Acid Complete is designed to meet the needs of individuals who may not be consuming, digesting, or absorbing…

**Pure Caps Amino NR**
Pure Encapsulations Natural ratio amino acid complex; supports athletic training efficiency and promotes immune and overall health. This formula is based on the ratios of amino acids found naturally in high biological value derived…

**Pure Caps Amino Replete**
Part of PureSYNAPSE™. Offers a comprehensive blend of free-form amino acids, provided in the ratios found naturally in high biological value (BV) protein sources. Maintains daily wellness with amino acid building…

**Pure Caps BCAA**
*Branched chain amino acids provide safe nutritional support for athletes and individuals seeking optimal lean muscle mass. The three branched chain amino acids, leucine, isoleucine and valine, boost energy while helping to…

**PRL Glutamine**
Glutamine Premier (100 Caps)
Premier Glutamine delivers L-glutamine (free form), derived from beneficial bacteria (not synthetic). Glutamine is a key amino acid that supports muscle and gastrointestinal tract…

**PRL Glutathione**
Dietary Supplement
GSH (The Premier Reduced Form)
Premier Detoxification, Liver and Immune Support
Premier Glutathione contains glutathione…
What are the very best Essential Amino Acid products to buy?

<table>
<thead>
<tr>
<th>Product</th>
<th>Information</th>
</tr>
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<tbody>
<tr>
<td><strong>ProThera L Carnitine</strong></td>
<td>Pure USP L-carnitine (250 mg). Heart and skeletal muscle contain abundant</td>
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<td></td>
<td>amounts of L-carnitine which is essential for meeting tissue energy demands</td>
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<td>by transporting fatty acids to the mitochondria. Normal …</td>
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<tr>
<td><strong>ProThera L Methionine</strong></td>
<td>Essential amino acid. This product contains L-methionine, an essential</td>
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<td></td>
<td>sulfur-containing amino acid that is used to form other amino acids such as</td>
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<tr>
<td></td>
<td>cysteine and taurine as well as other important compounds such as …</td>
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<tr>
<td><strong>Pure Caps L Arginine</strong></td>
<td>Arginine supports nitric oxide formation, important for healthy dilation of</td>
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<td></td>
<td>blood vessels, circulation, and blood flow. In a prospective, double blind</td>
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<tr>
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<td>trial, l-arginine supplementation supported healthy endothelial function in</td>
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<tr>
<td><strong>Pure Caps L Carnosine</strong></td>
<td>* L-Carnosine (beta-alanyl-L-histidine) occurs naturally in the body’s</td>
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<td>muscle and nervous tissues and is formed by the amino acids alanine and</td>
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<td>histidine. Levels of this dipeptide can decline with age. It is a water-</td>
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<td></td>
<td>solubile antioxidant with …</td>
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<tr>
<td><strong>Pure Caps L Lysine</strong></td>
<td>* Helps maintain healthy arginine levels and immune function.</td>
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<td>* L-Lysine, an amino acid, provides nutritional support for the body’s</td>
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<td>natural defenses. L-Lysine is particularly helpful in maintaining healthy …</td>
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<tr>
<td><strong>Pure Caps L Theanine</strong></td>
<td>Promotes relaxation; helps to moderate occasional stress.</td>
</tr>
<tr>
<td></td>
<td>* Green tea has been recognized for centuries as having relaxant properties</td>
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<tr>
<td></td>
<td>. L-Theanine, a unique amino acid derived from tea, provides the …</td>
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</tbody>
</table>
Pure Caps L Tryptophan
*Enhances serotonin synthesis for emotional well-being and restful sleep.
The essential amino acid L-tryptophan is a serotonin precursor. Research indicates that L-tryptophan supplementation may support …

ProThera GastroThera
Support gastrointestinal and immune function with this glutamine-rich, prebiotic formula. GastroThera™ provides intensive nutritional support for the entire GI tract by addressing four key areas of intestinal function: energy …

Pure Caps NAC
* N-Acetyl-l-Cysteine (NAC) is a derivative of the dietary amino acid l-cysteine. NAC has a high affinity for lung tissue, which it supports through mucolytic and antioxidant action. By disrupting disulfide bonds, NAC thins mucus. It is a …

Neurobiologix Calming Cram
This topical cream is designed to increase the levels of the calming reducing neurotransmitters in the brain such as dopamine, GABA and serotonin. For more information you may watch the video provided on this page for details on …

ProThera SAMe
Supports mood regulation, joints, and liver function. An impressive amount of research and long history of clinical use documents the benefits of SAMe. As a modulator of cell membrane fluidity system …

Pure Caps Selenomethionine
Antioxidant for immune system support
*Selenium is a natural antioxidant that delays the oxidation of polyunsaturated fatty acids and preserves the elasticity of tissue. Selenium is required for the production of certain flow …