



What is Protein as a Nutrient?

Protein is a **nutrient** needed by the human body for growth and maintenance. Aside from water, **proteins** are the most abundant kind of molecules in the body. **Protein** can be found in all cells of the body and is the major structural component of all cells in the body, especially muscle.

Types of Proteins

Protein is the basic component of living cells and is made of carbon, hydrogen, oxygen, nitrogen, and one or more chains of amino acids.

The three types of proteins are

1. Fibrous

2.Globular

3.Membrane.

Fibrous Proteins

Fibrous proteins form muscle fiber, tendons, connective tissue, and bone.

Examples of fibrous proteins are:

- Actin
- Arp2/3
- Collagen
- Coronin
- Dystrophin
- Elastin
- F-spondin
- Fibronectin
- Keratin
- Myosin
- Nebulin
- Plectin
- Spectrin
- Tau
- Titin

- Tropomyosin
- Tubulin

Globular Proteins

Globular proteins are more water-soluble than the other classes of proteins and they have several functions including transporting, catalyzing, and regulating.

Here are examples of globular proteins:

- Albumins
- Alpha globulin
- Beta globulin
- C1-inhibitor
- C3-convertase
- Cadherin
- Carboxypeptidase
- C-reactive protein
- Ependymin
- Factor VIII
- Factor XIII
- Fibrin
- Gamma globulin
- Hemoglobin

- IgA
- IgD
- IgE
- IgG
- IgM
- Integrin
- Myoglobin
- NCAA
- Protein C
- Protein S
- Protein Z
- Protein Z-related protease inhibitor
- Selectin
- Serum albumin
- Serum Amyloid P Component
- Thrombin
- Von Willebrand Factor

Membrane Proteins

Membrane proteins play several roles including relaying signals within cells, allowing cells to interact and transporting molecules.

Examples of membrane proteins include:

- CFTR
- C-myc
- Estrogen receptor
- FOXP2
- FOXP3
- Glucose transporter
- Glycophorin D
- Histones
- Hydrolases
- Muscarinic acetylcholine receptor
- MyoD
- Nicotinic acetylcholine receptor
- Oxidoreductases
- P53
- Potassium channel
- Rhodopsin
- Scramblase
- Transferases

Protein and Amino Acids

Both animal and plant proteins are made up of about 20 common amino acids. The proportion of these amino acids varies as a characteristic of a given protein, but all food proteins—with the exception of gelatin—contain some of each.

Amino acids consumed in excess of the amounts needed for the synthesis of nitrogenous tissue constituents are not stored but are degraded; the nitrogen is excreted as urea, and the keto acids left after removal of the amino groups are either utilized directly as sources of energy or are converted to carbohydrate or fat

Essential and Non-Essential Amino Acids

Nonessential amino acids can be made by the body, while **essential amino acids** cannot be made by the body so you must get them from your diet.

Conditional Amino Acids

Conditional amino acids are usually not **essential**, except in times of illness and stress

Types of Amino Acids

Essential AA	Nonessential AA	Conditionally essential AA
Arginine	Alanine	Cysteine
Histidine	Asparagine	Glutamine
Isoleucine	Aspartate	Hydroxyproline
Leucine	Glutamate	Proline
Lysine	Glycine	Taurine
Methionine	Serine	
Phenylalanine	Tyrosine	
Threonine		
Tryptophan		
Valine		

Top 10 Vegetarian Protein Foods

1. Tofu

Protein per Cup	Protein per 100g	Protein per 200 Calories
43.5g (87% DV)	17.3g (35% DV)	24g (48% DV)

2. Lentils

Protein per Cup	Protein per 100g	Protein per 200 Calories
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17.9g (36% DV)	9g (18% DV)	15.6g (31% DV)
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More Beans High in Protein

- 17.4g (35% DV) per cup of large white beans
- 16.3g (33% DV) per cup of split peas
- 15.4g (31% DV) per cup of pinto beans
- 15.2g (30% DV) per cup of black beans
- 15g (30% DV) per cup of navy beans
- 14.7g (29% DV) per cup of large lima beans
- 14.5g (29% DV) per cup of chickpeas (garbanzo beans)

3. Low fat Curd/Yogurt

Protein per Cup	Protein per 100g	Protein per 200 Calories
14g (28% DV)	5.7g (11% DV)	20.5g (41% DV)

4. Cottage cheese/ paneer

Protein per 1/2 Cup	Protein per 100g	Protein per 200 Calories
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11.8g (24% DV)	10.5g (21% DV)	25.8g (52% DV)
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5. Green peas

Protein per Cup Cooked	Protein per 100g	Protein per 200 Calories
8.6g (17% DV)	5.4g (11% DV)	12.8g (26% DV)

6. Squash and Pumpkin seeds

Protein per 1oz Handful	Protein per 100g	Protein per 200 Calories
8.5g (17% DV)	29.8g (60% DV)	10.4g (21% DV)

Other Nuts and Seeds High in Protein

- 6.9g (14% DV) per 1 oz handful of peanuts
- 6g (12% DV) per 1 oz handful of almonds
- 6g (12% DV) per 1 oz handful of pistachios
- 5.5g (11% DV) per oz of sunflower seeds
- 5.2g (10% DV) per oz of flax seeds
- 4.7g (9% DV) per oz (~2 tbsp) of chia seeds

- 4.3g (9% DV) per oz of cashews

7. Quinoa

Protein per Cup	Protein per 100g	Protein per 200 Calories
8.1g (16% DV)	4.4g (9% DV)	7.3g (15% DV)

Other Whole Grains High in Protein

- 9.8g (20% DV) per cup of kamut
- 9.8g (20% DV) per cup of teff
- 7g (14% DV) per cup of whole wheat pasta
- 5.9g (12% DV) per cup of oatmeal
- 4.4g (9% DV) per cup of grits

8. Peanut butter

Protein 2 Tblsp	Protein per 100g	Protein per 200 Calories
7.7g (15% DV)	24.1g (48% DV)	8.2g (16% DV)

9. Eggs (People who consider it Among non-veg can avoid this)

Protein in 1 Large Egg	Protein per 100g	Protein per 200 Calories
6.3g (13% DV)	12.6g (25% DV)	16.2g (32% DV)

10. Mushroom

Protein per Cup Cooked	Protein per 100g	Protein per 200 Calories
3.9g (8% DV)	3.6g (7% DV)	27.5g (55% DV)