

Protein and the Body

Dietary protein is required for normal structural and regulatory functions in the body. Amino acids, which make up proteins, are either created in the body or consumed in food which:

- Build and repair tissues (bone, muscle, tendons, ligaments)
- Facilitate chemical reactions via enzymes
- Coordinate bodily functions via hormones
- Transport nutrients throughout the body

Signs of Low Protein Intake

Protein deficiencies are rare in the Western diet, however, picky eaters and vegan/vegetarian athletes should be mindful of their protein intake to ensure optimal amounts are consumed relative to training needs. Early signs of inadequate protein intake for athletes may include:

- Muscle loss
- Slower recovery
- Limited training adaptations
- Poor sleep
- Edema (swelling)
- Changes in hair/skin/nails

Types of Protein

Not all protein sources are created equal. Higher quality proteins are easily digested and absorbed, contain all 9 essential amino acids, and have a higher leucine content than lower quality proteins. Leucine is the key essential amino acid that stimulates muscle protein synthesis.

Animal proteins contain more leucine than plant sources, however, combining a variety of plant proteins can also provide an adequate amount of leucine throughout the day for vegan/vegetarians. Plant proteins are not absorbed as efficiently and do not contain the same concentration of essential amino acids as animal sources



Key Points

Consider the following when determining your protein goals:

- More is not necessarily better, More protein \neq More muscle
- Consuming more protein than needed offsets other essential nutrients (aka carbohydrates and fat) in the diet
- Muscle growth results from a combination of genetics, diet, and appropriate training load
- Protein should be spread equally throughout the day every 3-5 hours, depending on training schedule
- Eat a variety of protein sources daily, especially plant sources

Protein Recommendations

Protein needs vary by body weight, activity level, and personal goals. Someone aiming to cut weight or recover from injury will have increased protein needs. No matter the goal, athletes should space out their protein intake throughout the day to ensure proper utilization.

| Activity Level | Protein Needs g/kg/day | 150lb (68 kg) Athlete | 180lb (82 kg) Athlete |
|--------------------------------|------------------------|-----------------------|-----------------------|
| Average, Non-Athlete | 0.8 - 1.0 | 54 - 68 g | 66 - 82 g |
| Endurance Athlete | 1.2 - 1.4 | 82 - 95 g | 102 - 115 g |
| Power Athlete | 1.5 - 1.8 | 102 - 116 g | 123 - 140 g |
| Injured or Weight Loss Athlete | 1.8 - 2.2 | 122 - 150 g | 148 - 180 g |

Common Protein Sources

| Food | Serving Size | Leucine per Serving | Protein per serving |
|-------------------------------|--------------------------------|---------------------|---------------------|
| Meat | 3 oz. chicken breast | 1.3 g | |
| | 3 oz. steak | 2.4 g | 26 g |
| | 3 oz. salmon | 1.5 g | 22 g |
| | 3 oz. ground turkey | 2.0 g | 17 g |
| | 1 egg | 0.5 g | 6 g |
| Dairy | 6 oz. Greek yogurt | 0.9 g | 18 g |
| | 1/2 c cottage cheese | 0.8 g | 12 g |
| | 8 oz. milk | 0.7 g | 8 g |
| | 1 oz. cheese | 0.5 g | 7 g |
| Beans, Legumes, Nuts, & Seeds | 1 c chickpeas | 1.0 g | |
| | 1 c cooked lentils | 1.3 g | 18 g |
| | 1/2 c shelled edamame | 0.6 g | 13 g |
| | 1 oz. nuts (or 2 T nut butter) | 0.5 g | 7 g |
| | 3 oz. tofu | 1.2 g | 7 g |
| | 3 oz. tempeh | 1.2 g | 16 g |
| Other | 1 scoop whey protein powder | 2.3 g | |
| | 1 scoop pea protein powder | 1.7 g | 20 g |
| | 1 protein bar | 1.6 g | 20 g |
| | 1 energy bar | 0.6 g | 11 g |

Calculate Your Protein Needs in 3 Steps

Example: 150 lb Endurance Athlete

- 1) Divide weight in lbs. by 2.2 to get weight in kg

$$150\text{lb} \div 2.2\text{kg/lb.} = 68\text{ kg}$$

- 2) Multiply by protein needs according to the chart

$$68\text{kg} \times 1.2\text{-}1.4\text{ g/kg/day} = 81\text{ - }95\text{ g/day}$$

- 3) Divide total protein by the number of meals/snacks a day

$$81\text{ - }95\text{ g/day} \div 5\text{ meals/snacks} = 16\text{ - }19\text{ g/meal or snack}$$

Test Your Knowledge

What are the protein needs of a 154lb power athlete?

Answer: At 70 kg, this athlete needs 105 -126 g/day, or if eating 5 meals/snacks, 21 -25 g/meal.

Aim for 2-3 g of leucine at meals to promote muscle growth. This could be 3 oz. of steak or 5 oz. of tofu.

