Calculating Protein Needs

Protein may be the most misunderstood of all the nutrients. Many athletes believe that protein is a critical nutrient for sport and that they need more of it than sedentary individuals. They are right. However, protein is not the only nutrient needed for sport, and, while athletes need more protein than inactive people do, the difference in protein needs is much smaller than most athletes believe it to be.

Approximately 20 amino acids are needed in many different processes involved in human physiology (1). As building blocks, amino acids are used to produce all tissues of the body, not just muscle. They are needed to make red and white blood cells, thereby playing a key role in oxygen transport to muscles and in immune function. They are also crucial for making hormones and enzymes, which regulate all body processes.

Research on protein needs for athletes has focused on two types of activity—endurance and strength-training.

Key Points About Protein

- The amount of protein needed by an athlete depends on the amount of energy and carbohydrate consumed. The body's highest priority is energy. The body will use protein as fuel if insufficient energy and carbohydrate are consumed.
- Athletes who drastically cut energy intake to lose weight need a higher percentage of protein than those consuming adequate calories.
- Recreational athletes who exercise at low levels of intensity (eg, recreational walkers or cyclers) do not need additional protein. The current Dietary Reference Intake (0.8 g/kg/day) is adequate (1).
- In endurance events, athletes use some protein as fuel (approximately 2%-6% of total energy expenditure in exercise). For this reason, plus the heavy training schedule associated with endurance events, endurance athletes need more protein than other athletes (1).
- Strength-training athletes need more protein during the initial phase of training (ie, the first 3 to 6 months) when muscle gain is most pronounced (1).
- Consuming adequate energy and protein is critical for building muscle mass, but protein intake by itself does not build muscle. Muscle mass is increased through progressive, resistance strength training.
- Studies are equivocal about the role of protein in muscle glycogen resynthesis. It appears that if sufficient carbohydrate is consumed in the immediate recovery phase, the addition of protein does not make the body more effective at restoring glycogen. However, if

carbohydrate is not consumed in sufficient amounts in the recovery period, protein may have an influence on glycogen resynthesis (1,2).

- The timing of protein intake may be more important to muscle hypertrophy than the total amount of protein consumed. A small dose of protein in the form of essential amino acids can improve muscle protein growth if it is ingested in the recovery phase of training. Consuming small doses of essential amino acids every 1 to 2 hours in the hours following strength training may have a positive effect on muscle growth (1). Some researchers have concluded that consuming protein before strength training also helps to build muscle (2).

Protein Recommendations for Endurance and Strength-Training Athletes

Protein Recommendations for Endurance Athletes

Situation	Recommendations	Example for a 70-kg (154-lb) Endurance Athlete
Daily intake	1.2-1.4 g/kg	84-98 g

Protein Recommendations for Strength-Training Athletes

Situation	Recommendations	Example for a 91-kg (200-lb) Football Player
Daily intake	1.6-1.7 g/kg	146-155 g
Initial phase of training (first 3-6 months)	1.7 g/kg	155 g
Immediately before strength training*	0.1 g/kg	9 g high-quality protein†
Immediately after strength training* and every 1-2 hours in recovery	0.1 g/kg	9 g high-quality protein†

*These recommendations are based on most current research but are not conclusive.

†High-quality protein contains all essential amino acids.

Foods with 10 g Protein

- 1½ oz beef or pork
- 1½ oz chicken or turkey
- 1½ oz fish
- 2 hot dogs (2 oz each)
- 2 slices of canadian bacon (1 oz each)
- 8 oz yogurt
- 1 package (37 g) instant breakfast and ¾ cup milk
- 10 oz milk
- ½ cup cottage cheese
- 1½ oz (½ single patty) hamburger
- 1½ oz cheese
- 2 small eggs or 2 egg whites
- 1 frozen burrito (5 oz)
- 1 enchilada (7 oz)
- ¾ cup chicken noodle soup
- ½ cup macaroni and cheese
- 1 oz cashews
- 2 oz mixed nuts
- 2½ Tbsp peanut butter
- 2 oz sunflower seeds
- 1 Clif Bar (68 g)
- 1 Luna Bar (48 g)
- ½ Clif Builders Bar (1 bar = 68 g)
- ½ can Gatorade Nutrition Shake (1 can = 11 oz)
- 1 Gatorade Energy Bar (2.3 oz)
- ½ can MetRx RTD lite (1 can = 11 oz)
- ¼ can MetRx RTD 40 (1 can = 15 oz)
- 1/3 MetRx Protein Plus Bar (1 bar = 85 g) or 1/3 Big 100 Bar (1 bar = 100 g)
- 1 Marathon Bar (50 g)

References

1. Gibala MJ, Howarth KR. Protein and exercise. In: Dunford M, ed. *Sports Nutrition: A Practice Manual for Professionals.* 4th ed. Chicago, Ill: American Dietetic Association; 2006:33-49.
2. Coleman R. Carbohydrate and exercise In: Dunford M, ed. *Sports Nutrition: A Practice Manual for Professionals.* 4th ed. Chicago, Ill: American Dietetic Association; 2006:14-32.