Protein

1.4

Protein Keys

- Provides essential amino acids (building blocks) to your body's cells
- Aids in the development of new tissues for growth and repair (e.g. muscles)
- Helps make important enzymes, hormones, and antibodies
- Keeps your body's cells in fluid balance
- Transports important substances in the blood
- Provides small amounts of energy during exercise

What you need to know

As an athlete, your protein needs are higher than people who are not training. And when you are in a hypertrophy or "muscle-building" phase of training, your protein needs are the highest. So, if you want bigger muscles, you should just eat more protein, right? Well, it's not that simple. True, protein is an essential nutrient for athletes. And, yes, it is critical for muscle development. However, the process of building and repairing muscle tissue requires a combination of appropriate strength training, eating more calories than you are burning, consuming a balance of nutrients (carbohydrates, fat, AND protein), and a consistent recovery nutrition plan.

WARNING Many athletes consistently consume too much protein. It's important to realize that excess protein can lead to dehydration and weaken your bones. It can also interfere with your body's muscle-building hormones, energy level, and recovery. In very high amounts, excessive protein can cause kidney and liver damage, particularly in individuals pre-disposed to these types of problems.

Protein not only functions in the muscle-building process. It has many other roles in your body. It is involved in the repair of tissues including tendons, ligaments, and skin, in addition to muscles. Hormones, enzymes, and many structures in your body are also made of protein.

Is protein used for energy?

It is a common misconception that protein is a major energy source during exercise. In reality, protein contributes to less than 10% of fuel used during exercise. Higher amounts of protein are broken down when exercise is very long (over 2-3 hours) or when carbohydrate stores are inadequate. If you skip meals during the day, your diet is too low in carbohydrates, or you don't take in enough carbohydrates during long, intense exercise, your body may break down muscle protein for fuel. After all that hard work in the weight room, the last thing you want to do is break down muscle due to improper nutritional habits!

Clearly, it's important to understand where protein comes from in the diet, how to take it in consistently, and how to maximize intake based on your workouts.

Calculating protein needs

Daily protein needs are based upon your body weight and training routine. Athletes who are working out for fitness or who are in moderate training (for example, shorter off-season workouts), need at least .5 grams of protein per pound of body weight daily. For instance, if you run, swim, or bike 3-4 days a week for 30-60 minutes, .5 grams of protein per pound of body weight (100 grams of protein a day for a 200-pound athlete) may be appropriate.

But your needs really change when you are working out extremely hard, or in the most rigorous phases of your training. For example, during the season, when you are training hard AND competing, or when workouts are significantly longer and more intense, your body will use more protein—both for muscle building and maintenance, and for repair and recovery. Protein needs may be as high as 1.0 gram of protein for every pound you weigh. Intakes above 1.0 gram of protein per pound have not been shown to provide additional benefit. If you are vegetarian, or don't eat very much meat in your diet, you need to pay special attention to your protein intake.

ESTIMATED PROTEIN NEEDS BASED ON BODY WEIGHT AND EXERCISE LEVEL

	Maintain muscle mass →→→→	*Gain muscle mass*
	Moderate workouts →→→→	*Intense workouts*
Weight	**Low end (.5 grams/pound)**	**High end (1.0 grams/pound)**
120 pounds	60 grams	120 grams
160 pounds	80 grams	160 grams
200 pounds	100 grams	200 grams
240 pounds	120 grams	240 grams
280 pounds	140 grams	280 grams
320 pounds	160 grams	320 grams

My protein needs = _____ – _____ grams per day

Protein in Food

Once you've determined your protein needs, you can assess your own diet to see how your intake stacks up. Foods high in protein include meats, milk products, foods made with soy protein, selected energy bars and drinks, beans and peas, nuts, nut butters, and seeds. Smaller amounts of protein are also found in grains and vegetables. When choosing meats, go for lower-fat versions like skinless chicken or turkey breast, sirloin, tenderloin, pork loin, ham or Canadian bacon, baked or broiled fish, and venison. Make sure you vary your protein sources to optimize levels of all the different amino acids. For example, chicken breast is good, but getting in lean sirloin, pork loin, and fish gives you a better overall protein balance. The high-protein foods below are rounded off to the nearest 5 grams of protein so you can easily pick and choose options that work well for you.

Food	Serving Size	Protein (grams)
Turkey breast and chicken breast	4 ounces (1/4 pound)	30
Lean pork loin, sirloin, roast beef, or red meat	4 ounces	30
Lean ground beef or ground turkey patties	4 ounces	30
Grilled fish	4 ounces	30
Canned tuna or salmon	½ cup	25
Fast food grilled chicken sandwich	1	25
Scrambled eggs	3	20
Fast food hamburger or cheeseburger	1	15
Cottage cheese	½ cup	15
Plain yogurt	1 cup	15
Small fast food milkshake	1	15
Flavored yogurt	1 cup	10
Milk	10 ounces	10
Soy milk	10 ounces	10
Boiled egg whites	3	10
Baked beans	1 cup	10
Green peas	1 cup	10
Peanut butter or soy nut butter	2 Tablespoons	10
Peanuts and other nuts and seeds	¼ cup	10
Toasted wheat germ	¼ cup	10
Tofu	½ cup	10
Veggie burger patty	1	10
Rice or pasta, cooked	1 cup	5
Oatmeal or whole grain cereal	1 cup	5
Whole grain bread	2 slices	5
Cheese	1 ounce	5

BONUS POINT Protein: On the Go and In the Budget

10 Proteins "on the cheap"

Quality protein doesn't have to cost a lot!

- Eggs
- Skim or lowfat milk in gallon containers and dry nonfat milk powder to add to shakes and smoothies for a quality protein "boost"
- Beans (baked beans, black beans, chili beans, lentils)
- Meats packaged in bulk (e.g. 5-pound packages of sirloin or pork loin)
- Cottage cheese
- "Homemade" cheese sticks cut from blocks of mozzarella cheese
- Textured Vegetable Protein (dry soy protein) found in bulk—add to soups, pasta sauces, and burgers
- Fast food: roast beef sandwiches, grilled hamburgers, chicken or bean tacos or burritos, or grilled chicken sandwiches
- Peanuts, peanut butter, soy nuts, and sunflower seeds
- Canned tuna or chicken

Scrambled Eggs In the Microwave

- 2 whole eggs
- 1 Tablespoon of water or milk
- Non-fat cooking spray
- Salt and pepper, if desired

Spray a small, circular microwave-safe dish (e.g. glass), with non-fat cooking spray. Crack eggs into dish and "whisk" with a fork. Microwave 45-60 seconds, stirring after the first 30 seconds.

Remove from dish and eat plain, with salsa, or on a sandwich.

10 Portable Proteins

- Sports bars
- Sports shakes / recovery shakes
- Pistachios, peanuts, almonds, walnuts, or soy nuts
- Sunflower seeds
- Peanut butter sandwiches
- Beef/meat jerkey and veggie jerkey
- Instant breakfast drink packets (e.g. Carnation Instant Breakfast™)
- High-protein cereals (e.g. Go Lean™, Optimum™)
- Canned tuna, salmon, or chicken (or "rip top")
- Dehydrated bean soup mixes

Homemade Trail Mix:

Inexpensive and Portable

- 6 cups whole grain cereal (oat squares, frosted wheat squares, honey oat circles, bran squares, etc.)
- 1 cup salted soy or other type of nuts
- 1 cup sunflower seeds
- 1 cup raisins
- 1 cup dried apples
- a handful of chocolate or butterscotch chips if desired

*Makes 8 1-cup servings. Fill ziploc bags and you're off!

This handout was designed by Sports Dietitians Michelle Rockwell, MS, RD, CSSD and Susan Kundrat, MS, RD, CSSD to provide general education. For specific concerns, refer to your sports medicine team.