

Protein:

What is Protein?

Proteins are part of every cell, tissue, and organ in our bodies. These body proteins are constantly being broken down and replaced. The protein in the foods we eat is digested into amino acids that are later used to replace these proteins in our bodies.

Many foods contain protein, but the best sources are beef, poultry, fish, eggs, dairy products, nuts, seeds, and legumes like black beans and lentils. Protein builds up, maintains, and replaces the tissues in your body. Your muscles, your organs, and your immune system are made up mostly of protein.

Protein in the body:

Proteins represent half of your body's dry weight

One third is in muscle

One fifth is in bone and cartilage

One tenth is in skin

The remainder is in body tissues and fluids

Protein needs:

Needed for growth and maintenance, especially during infancy, childhood, teenage years, pregnancy, and lactation

Increased needs during sickness and recovering from surgery or injury

Needed in our diet on a daily basis

Amino acids are the building blocks of proteins. There are 20 amino acids that are important to human nutrition. Nine of these are considered essential. Our bodies cannot make them so it is important to get them from food. We can synthesize the other eleven in our bodies.

Two types of dietary protein:

Complete

Incomplete

A complete protein contains an adequate proportion of all of the essential amino acids for the dietary needs of humans or other animals. The protein source should contain all essential amino acids, but also containing them in complete proportion for use by the human body. A source may contain all essential amino acids, but contain one in lower proportion to the others, making it an incomplete protein. In

order to be a complete protein, the source must contain all essential amino acids and contain them in complete proportion for use by the body.

Animal sources of protein generally provide a complete protein – except gelatin.

You might think Americans are at risk for not eating enough protein. In fact, most of us eat more than we need. Protein is in many foods that we eat on a regular basis.

Food sources:

- meats, poultry, and fish
- legumes (dry beans and peas)
- tofu
- eggs
- nuts and seeds
- milk and milk products
- grains, some vegetables, and some fruits (provide only small amounts of protein relative to other sources)

An incomplete protein is inadequate in one or more of the nine amino acids essential for normal growth and maintenance of tissue when used as the sole source of protein and adequate energy is available.

Plant-based sources of protein are generally incomplete proteins.

So how can we get an incomplete protein to be more “complete”?

Complementary protein is any protein that is incomplete on its own but may become complete when combined with other proteins to provide all of the amino acids necessary for normal metabolism.

For example, rice contains low amounts of certain essential amino acids; however, these same essential amino acids are found in greater amounts in dry beans. Similarly, dry beans contain lower amounts of other essential amino acids that can be found in larger amounts in rice. Together, these two foods can provide adequate amounts of all the essential amino acids the body needs.

Did you know? In the past, it was thought that these complementary proteins needed to be eaten at the same meal for your body to use them together. Now studies show that your body can combine complementary proteins that are eaten within the same day.

Vegetarianism:

Vegetarians fall into the following groups:

- Vegans: consume foods only from plant sources, no animal products
- Fruitarians: eat only fruit, nuts, and green foliage
- Lacto-vegetarians: eat foods from plant sources and dairy products

- Ovo-vegetarians: eat foods from plant sources and eggs
- Lacto-ovo vegetarians: eat foods from plant sources, dairy products, and eggs
- Semi-vegetarians: eat no red meat, but eat poultry and seafood

Because some vegetarians avoid eating all (or most) animal foods, they must rely on plant-based sources of protein to meet their protein needs. It is important for these individuals to eat complementary proteins to meet their bodies' needs.

Protein recommendations:

Protein: 10-35% of total calories. This would be 20 to 70 grams on a 2000-calorie diet.

Recommended Dietary Allowance for Protein		
		Grams of protein needed each day
Children	Ages 1-3	13
	Ages 4-8	19
	Ages 9-13	34
Girls	Ages 14-18	46
Boys	Ages 14-18	52
Women	Ages 19-70+	46
Men	Ages 19-70+	56

Here are examples of amounts of protein in food:

- 1 cup of milk has 8 grams of protein
- A 3-ounce piece of meat has about 21 grams of protein
- 1 cup of dry beans has about 16 grams of protein
- An 8-ounce container of yogurt has about 11 grams of protein

Added together, just these four sources would meet the protein needs of an adult male (56 grams). This doesn't count all the other foods that add smaller amounts of protein to his diet.

Activity:

Pick out foods to meet the needs of a child, a young male, and an adult woman, as well as a vegetarian male. Object is to pick foods that will equate to the

recommended amounts of protein for each person. Protein does not need to be eaten at every meal.

Benjamin is a 2-year-old boy. He is learning to eat a variety of foods.

How many grams does he need? _____

Breakfast:

Snack:

Lunch:

Snack:

Dinner:

Patrick is 15-year-old high school student with a big appetite. He eats everything that is put in front of him.

How many grams does he need? _____

Breakfast:

Snack:

Lunch:

Snack:

Dinner:

Sarah is 43-year-old busy mother. She does not like to eat red meat or pork.

How many grams does she need? _____

Breakfast:

Snack:

Lunch:

Snack:

Dinner:

Matthew is a 28-year-old vegetarian. He does not eat the flesh of an animal, but does eat eggs, cheese, and other dairy products.

How many grams does he need? _____

Breakfast:

Snack:

Lunch:

Snack:

Dinner:

Beef:

Hamburger patty, 4 oz – 28 grams protein
Steak, 6 oz – 42 grams
Most cuts of beef – 7 grams of protein per ounce

Chicken:

Chicken breast, 3.5 oz - 30 grams protein
Chicken thigh – 10 grams (for average size)
Drumstick – 11 grams
Wing – 6 grams
Chicken meat, cooked, 4 oz – 35 grams

Fish:

Most fish fillets or steaks are about 22 grams of protein for 3 ½ oz of cooked fish, or 6 grams per ounce
Tuna, 6 oz can - 40 grams of protein

Pork:

Pork chop, average - 22 grams protein
Pork loin or tenderloin, 4 oz – 29 grams
Ham, 3 oz serving – 19 grams
Ground pork, 1 oz raw – 5 grams; 3 oz cooked – 22 grams
Bacon, 1 slice – 3 grams
Canadian-style bacon (back bacon), slice – 5 – 6 grams

Eggs and Dairy

Egg, large - 6 grams protein
Milk, 1 cup - 8 grams
Cottage cheese, ½ cup - 15 grams
Yogurt, 1 cup – usually 8-12 grams, check label
Soft cheeses (Mozzarella, Brie, Camembert) – 6 grams per oz
Medium cheeses (Cheddar, Swiss) – 7 or 8 grams per oz
Hard cheeses (Parmesan) – 10 grams per oz

Beans (including soy)

Tofu, ½ cup 20 grams protein
Tofu, 1 oz, 2.3 grams
Soy milk, 1 cup - 6 -10 grams
Most beans (black, pinto, lentils, etc) about 7-10 grams protein per half cup of cooked beans
Soy beans, ½ cup cooked – 14 grams protein
Split peas, ½ cup cooked – 8 grams

Nuts and Seeds

Peanut butter, 2 Tablespoons - 8 grams protein

Almonds, ¼ cup - 8 grams

Peanuts, ¼ cup - 9 grams

Cashews, ¼ cup - 5 grams

Pecans, ¼ cup - 2.5 grams

Sunflower seeds- ¼ cup - 6 grams

Pumpkin seeds,- ¼ cup - 19 grams

Flax seeds - ¼ cup - 8 grams

Fruits:

Avocado, medium- 4 grams

Banana, medium- 1 gram

Blackberries, 1 cup- 1 gram

Grapes, 1 cup- 1 gram

Orange, medium- 1 gram

Tomato- medium- 1 gram

Vegetables:

Lentils, 1 cup- 18 grams

Black beans, 1 cup- 15 grams

Peas, 1 cup- 5 grams

Broccoli, 1 cup- 4 grams

Bread:

White, 1 slice- 2 grams

Whole wheat, 1 slice- 3 grams

We can see that adequate amounts of protein are available in foods we eat everyday.

How much protein do you eat each day?

In summary, protein is an important component of the body. It is broken down into amino acids and used to produce body proteins. It is found in meats and legumes, as well as grains and some vegetables. It provides our bodies with 4 calories per gram.