

Vary Your Protein

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Fact Sheet

This fact sheet addresses how to choose a wide variety of lean or low-fat protein-rich foods and answers practical questions about them, including:

- Why eat them?
- How much protein is needed?
- How can protein foods be more affordable?
- How can I keep protein-rich foods safe to eat?



Vary your protein choices

Most people's health would benefit from getting more variety in their protein-rich food choices. Strive to eat a variety of lean or low-fat protein-rich foods each week by making choices from all seven categories. (See the next section for examples of foods in each category.)

What about you? Do you vary your protein choices each week? For example, at meals eat seafood salads, baked beans or soups featuring various cooked dry beans, and vegetable-based casseroles made with eggs, lean poultry or red meats. For snacks you could choose nuts or seeds, and fat-free or low-fat soy or dairy products.

Seven categories of protein-rich foods

1. **Cooked dry beans and peas**, such as azuki beans, black beans, black-eyed or cow or crowder peas, chickpeas or garbanzos, fava or broadbeans, great northern or navy or cannellini beans, kidney or red beans, lentils, lima beans, lupini beans, pigeon peas, pinto beans, split or whole green peas; and soy beans and foods made with soy, such as soy milk, tofu, texturized vegetable protein, miso and tempeh
2. **Dairy products**, such as milk, yogurt and cheeses
3. **Eggs**, usually from domestic chickens
4. **Finfish and shellfish**, such as anchovies, barramundi, basa, bass, bluegill, carp, catfish, clams, cod from the Pacific, crab, crappie, crayfish, flounder from the Pacific, grouper, haddock, halibut from the Pacific, herring, lobster, mackerel, mahi mahi, marlin, mussels, octopus, oysters, perch, pollock, porgy, salmon, sardines, scallops, scrod, shrimp, snail, snapper, sole from the Pacific, squid or calamari, surimi, swai, tilapia, trout, tuna, walleye, whitefish and whiting



5. **Nuts and seeds**, such as almonds, Brazil nuts, cashews, chestnuts, flaxseed, hazelnuts or filberts, macadamia nuts, peanuts, pecans, pine nuts, pistachios, pumpkin seeds, sesame seeds, squash seeds, sunflower seeds and walnuts

6. **Poultry**, such as chicken, turkey, duck, goose, ostrich and emu, including giblets

7. **Red meats**, such as beef, pork, organ meats, lamb, goat, bison, venison and wild game



6. Limit intake of high-fat dairy products, including cream and whole milk, and products made from them such as ice cream and many cheeses.

7. Lower-fat versions of many processed meats and dairy products are available. Read the Nutrition Facts label to choose those with less fat and saturated fat.

8. Keep foods lean by draining fat during cooking, and by baking, broiling, roasting, poaching, boiling, grilling or pan-frying without added fat. Prepare foods without high fat sauces or gravies, and avoid breading, because it can soak up fat.

Eight ways to go lean with protein

People living in the U.S. could improve their health by eating protein-rich foods that are lower in saturated fats. Here are eight ways to reduce saturated fats in protein-rich foods:

1. Choose meals made with cooked dry beans and peas, fat-free or low-fat dairy products, egg whites, fish, nuts and seeds often.
2. Choose lean cuts of red meats (such as loin cuts, round cuts, or chuck shoulder and arm roasts), and cut off any visible fat.
3. For ground meats, choose 90 percent to 100 percent lean.
4. Discard poultry skin. Breast meat has less fat than dark meat.
5. Eat less bacon and few, if any, high-fat meats (such as marbled and fatty cuts of beef, pork and lamb), hot dogs, bologna slices, or regular sausages (such as pepperoni and salami).

Protein – Vital for health

The savory taste of some cheeses, fish, poultry, red meats and other protein-rich foods is one of the five basic tastes (the other four are sweet, sour, salty and bitter). This savory taste is called “umami,” a Japanese word that means delicious. Besides their wonderful effect on our taste buds as a great tasting part of meals, what else do protein-rich foods do for the body?

Protein-rich foods are essential for many functions of the body. Our muscles are primarily protein, but did you know that protein provides structure for all cells in the body? Typically, protein makes up about 15 percent of a person’s body weight. Dietary protein is needed during growth. It helps maintain healthy organs (brain, heart, lungs, etc.), bones, joints, skin, hair and blood cells. It is formed into essential hormones, vitamins, enzymes and important cell components. Proteins also provide “taxi service” to transport molecules from one place in the body to another.

Protein-rich foods are nutrient-rich foods

Foods that naturally contain protein (not protein supplements) are also rich in other nutrients. For instance, many protein foods are excellent sources of B vitamins (including niacin, riboflavin, thiamin, vitamin B6 and vitamin B12), vitamin E, iron, zinc, magnesium and healthful omega 3 fats. In addition, they provide energy and satisfy our appetites.

Cold-water fish (such as salmon, trout and herring) are high in protein and also high in omega 3 fats.

Eating nuts and seeds boosts intake of healthful monounsaturated and polyunsaturated fat. Some nuts and seeds (such as walnuts and flax) are excellent sources of omega 3 fats. In general, one ounce of nuts or seeds or two tablespoons of peanut butter contribute the equivalent of four teaspoons oil in addition to providing protein. Other nuts and seeds (such as sunflower seeds, almonds and hazelnuts) are good sources of vitamin E.

Cooked dry beans and peas, or legumes, are recommended for everyone, including people who eat red meats, poultry and fish regularly. The 2005 Dietary Guidelines for Americans recommend a weekly intake of three cups of cooked dry beans and peas, or an average of almost one-half cup per day. Legumes contribute many important nutrients, including dietary fiber, vitamins and antioxidants. In fact, they are the only group of foods that are categorized both as protein-rich foods and as vegetables.



What is a complete or incomplete protein?

Protein is made of amino acids. The human body can make some amino acids, but other amino acids are required from food sources.

Protein foods that contain all nine indispensable dietary amino acids in sufficient amounts are known as “complete” or “high-quality” protein. High-quality proteins come from animals, including dairy products, eggs, fish, poultry and red meats.

Protein-rich plant foods (including cooked dry beans and peas, nuts and seeds) are low in one or more of the indispensable dietary amino acids. Thus, they are “incomplete proteins.”

Different plant foods are incomplete in different amino acids. Eating a variety of protein-rich plant foods plus other kinds of plant foods – such as grains and cereals, starchy roots and vegetables – provides all nine indispensable dietary amino acids in sufficient amounts.

Including both types – high-quality and incomplete proteins – in the diet is recommended. In North America, plant proteins account for more than half, about 65 percent, of the available food protein per person. Protein from animals and seafood contribute the remaining 35 percent.

How much protein is enough?

The amount of protein required for good health depends, in part, on whether enough total calories are being eaten. If a person does not eat enough carbohydrates and/or fats to meet his or her daily energy needs,

the protein eaten gets converted to energy rather than being used to support growth and maintain structures of the body.

If adequate calories are eaten from carbohydrates and fat, the amount of protein needed depends on one's body size and age.

The protein needs of adults

Picture two decks of playing cards or two cassette tapes. As a general guideline, that is the daily amount (five to seven ounces) of protein-rich foods recommended by MyPyramid for most healthy teens and adults, in addition to the protein provided by three cups of milk. For example, half of a small boneless skinless chicken breast is about the size of one deck of playing cards, weighs about three ounces after cooking, and provides about 27 grams of protein.



The guideline of eating five to seven ounces a day can be used for protein-rich food choices of hard cheese, cooked boneless fish, poultry or red meat; or peanut butter and other nuts or seeds. For healthful variety, substitute two ounces of those kinds of protein-rich choices with one-half to one cup of cooked dry beans and peas (the exact amount depends on the type of legume), or with one cup of tofu.

The protein requirement for adults is fairly small, only 36 to 72 grams of good-quality protein per day for adults of all ages weighing from 100 to 200 pounds. Specifically, the amount needed is 0.8 grams protein per kilogram body weight, which is the same as 0.36 grams protein per pound of body weight.

The Institute of Medicine recommends that, in order to meet the body's daily

nutritional needs and minimize risk for chronic disease, adults eat from 10 to 35 percent of their total calories as protein. People living in the U.S. currently meet this recommendation, and typically get between 12 to 18 percent of their total calories as protein. Measuring how much protein one eats each day could be a time-consuming project, since in addition to protein-rich foods, small amounts of protein are found in many other commonly-eaten foods.

The recommendation for pregnant and breastfeeding women is to eat an extra six to eight grams of protein each day.

For healthy adults doing resistance and/or endurance exercise, the Institute of Medicine advises that no additional dietary protein is needed.

People with specific health conditions, such as kidney disease or diabetes, should talk with their health care provider regarding how much protein to eat.

Examples of portions that provide about six to eight grams of protein

To meet their protein needs, most healthy teens and adults are advised to choose eight to ten of a variety of these portions each day.

- ◆ 1 ounce cooked lean and boneless fish, poultry or red meat
- ◆ 1/4 to 1/2 cup cooked dry beans or peas, depending on the type
- ◆ 1/2 cup tofu
- ◆ 1 egg
- ◆ 2 tablespoons peanut butter

- ◆ 1 to 2 ounces nuts or seeds
- ◆ 1 cup milk
- ◆ 1 ounce hard cheese
- ◆ 1/4 cup cottage or ricotta cheese



The protein needs of children and youth

Babies and children need more protein per pound of body weight than adults do, because of their rapid growth. However, when they have smaller body weights, the total amount of protein they need each day is less than what adults need.

Daily protein requirements range from about 11 grams for a 1-year-old child, to 34 grams for pre-teens, to 52 grams for teen boys. For children ages 1 to 3 years, protein should account for 5 to 20 percent of their total calories. It is advisable for children ages 4 to 18 years to eat 10 to 30 percent of their total calories as protein.

Most healthy children ages 2 to 8 years need to eat protein foods that amount to the size of one deck of playing cards each day (two to four ounces), in addition to the protein provided by two cups of milk.

Most healthy pre-teens need protein-rich foods that amount to the size of one and one-half decks of playing cards (five ounces), plus three cups of milk.

Who should be eating more protein?

Many older adults in the U.S. do not eat the amount of protein recommended. According to a recent study by the National Institutes of Health, some older people lose significant amounts of muscle

mass, are more likely to fall and then suffer injuries, and have trouble doing basic muscular activities needed for independent daily living. If this sounds like you or a family member, talk with your health care provider or a registered

dietitian about your typical eating patterns. Please note that these symptoms could be signs of other health problems instead of a need for more dietary protein.

Ten ways to make protein-rich foods more affordable

1. Match protein intake more closely to dietary protein needs (see pages 3 and 4). This would amount to smaller portions for most people living in the U.S. On average, adult men eat from 71 to 101 grams of protein per day. For women, the average amount of protein eaten is 55 to 62 grams per day.

One way to scarcely notice that you are serving smaller portions of protein-rich foods is to put them into main dishes that include grains, rice or pasta and plenty of vegetables. Flavor with low-fat sauces, herbs and spices.

2. Purchase just the amount you need. When choosing raw meat without bones or fat, plan that a pound (which is 16 ounces) will provide about 12 ounces after cooking, or a two-day supply for one person. If buying raw meat with a lot of bone, gristle and fat, such as a whole chicken or turkey, plan that a pound will provide about six ounces after cooking, or a one-day supply for one person.

3. Frequently choose those protein-rich foods that provide the most grams of protein per dollar after they're prepared and ready to eat (that is, just the edible portion without bones or fat). The least expensive protein-rich foods are:

bagged dry beans, lentils and peas; dry milk powder; canned dry beans; canned mackerel and tuna; frozen dry beans; and peanut butter.

The Food Assistance Program can help people of all ages with low income buy nutritious foods for a better diet. To find out more, call toll-free 800-221-5689.

4. Buy according to the least expensive unit price. This would be the cost per egg, or the cost per protein ounce (divide the number of ounces it will yield per pound into the cost per pound) for other protein foods.
5. Do some of the preparation work yourself. For instance, cut up and/or de-bone your own poultry. Usually you will save money when buying protein foods that you have to chop, shred and/or cook yourself. Prepared main dishes are usually either more expensive or they contain very little protein-rich food.
6. Substitute more costly cuts with less expensive cuts of red meats. Marinating less-tender cuts or cooking them slowly in a liquid (moist heat) will make them more tender.
7. Check for sale prices. Include the reduced-price foods in your weekly meals.
8. Purchase extra amounts of a protein-rich food that you use often when it is on sale at an exceptionally low price and if you have a little extra cash and the cupboard or freezer space to store it.

Freeze perishable protein-rich foods in meal-size portions, either raw or

after cooking them. To maintain quality, overwrap raw poultry or red meat in its original package with foil or plastic wrap, or place in freezer containers that are designed to protect foods from excess moisture loss. Plan to eat them

within one or two months, although some types may be safely frozen for up to one year.

9. Use or freeze perishable protein-rich foods soon after purchase. Plan to cook or freeze

fresh fish, poultry, stew meats and ground meats within two days. Cook or freeze cuts of red meats within three to five days. Check the "Use by" dates on dairy products, eggs, and canned or other packaged foods.

Plan to use jarred, canned, frozen or dried protein-rich foods after the fresh perishable foods have been used and before you shop again.

10. Plan to use or freeze leftovers to avoid having to throw protein-rich foods away. On average, people living in the U.S. could save both time and money (10 percent or more on their grocery bill) by wasting less food.

Check the refrigerator daily for perishable foods that need to be eaten soon. Even small amounts make tasty, quick and nourishing additions to salads, soups and stews, sandwiches and casseroles. And homemade main dish leftovers, or "planned-overs," are usually healthier, faster, less costly and more convenient – without the time and gasoline needed – than going to a restaurant. For instance, you could plan to thaw accumulated frozen protein-rich

leftovers/planned-overs to serve as a meal when you don't have time to cook.

Advice for women and children

To reduce the risk of mercury contamination, the Food and Drug Administration advises four groups of people to avoid four specific types of fish. Women who may become pregnant, pregnant women, nursing mothers and young children should not eat shark, swordfish, king mackerel or tilefish. Rather, they could eat up to 12 ounces (two or three meals) a week of cooked fish that is low in mercury, such as canned light tuna, salmon, pollock, catfish and shrimp.

For more information, interested persons may call 1-888-SAFEFOOD or visit the Web site www.cfsan.fda.gov/seafood1.html

Food safety tips for handling and storing protein-rich foods

1. Clean:

- ◆ Wash your hands before and after handling raw eggs, fish, poultry and red meats.
- ◆ Wash trays, cutting boards, knives, utensils and counter tops in hot soapy water after using them for a raw protein-rich food.
- ◆ Do not wash or rinse raw poultry or red meats, because of the danger of contaminating the sink area with bacteria.

2. Separate:

- ◆ Keep raw foods separate from cooked and ready-to-eat foods while shopping, preparing and storing them by using separate bags, dishes and utensils.
- ◆ Keep raw fish, poultry and red meats

on trays in the refrigerator, so their juices don't drip onto other foods.

3. Cook:

- ◆ Use a meat thermometer to test fish, poultry and red meats for doneness, which is usually at least 160 degrees F. For endpoint cooking temperatures of specific foods, visit the Web site, www.cfsan.fda.gov/~ear/temperat.html
- ◆ Avoid eating raw unpasteurized dairy products, and raw or undercooked eggs, poultry or red meats, or foods containing them.

4. Chill:

- ◆ Refrigerate or freeze perishable protein-rich foods soon after purchasing and after serving them. Perishable foods include pre-cooked (soaked) and cooked dry beans and peas, dairy products, eggs, fish, poultry, and red meats, and foods made with them.
- ◆ Refrigerate or freeze perishable foods in shallow containers so they will cool faster.
- ◆ Thaw protein-rich foods in the refrigerator, in a microwave oven or in an air-tight package under cold running water. Never thaw protein-rich foods at room temperature, except for raw dry beans and peas, or nuts and seeds.
- ◆ Discard a perishable food if it has been at room temperature (between 40 and 90 degrees F.) for more than two hours. (Discard after one hour if the temperature is above 90 degrees F.) Even though it may still look and smell good, harmful bacteria will have had the time, temperature and food they need to grow in large enough

numbers to make you sick with a foodborne illness.

Summary

In order to achieve good tasting and more affordable meals – along with improved health – tips were shared about choosing and using lean or low-fat protein-rich foods, including cooked dry beans and peas, dairy products, eggs, fish, nuts, seeds, poultry and red meats.

For more information and recipes using each category of protein-rich foods, visit our Web site at www.oznet.ksu.edu/humannutrition/protein. For more information about healthy eating, contact your local extension office.

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