

Your Guide to Diet and Diabetes



Food Groups and Diabetes

What are macronutrients?

Macronutrients are nutrients that provide calories (energy). Nutrients are substances needed for growth, metabolism, and other functioning. Since “macro” means large, macronutrients are nutrients needed in large amounts. There are three categories of macronutrients:

- Carbohydrates
- Proteins
- Fats

While each of these macronutrients provides calories, the amount of calories that each one provides varies. One gram of carbohydrate or protein provides 4 calories per gram. One gram of fat provides 9 calories per gram. If you looked at the Nutrition Facts label of a food product and it said 12 grams of carbohydrate, 0 grams of fat, and 0 grams of protein per serving, you would know that this food has about 48 calories per serving (12 grams carbohydrate multiplied by 4 calories for each gram of carbohydrate = 48 calories). The only other substance that provides calories is alcohol, which provides 7 calories per gram. Alcohol, however, is not a macronutrient, because we do not need it for survival.

Macronutrients are not the only things that we need for health. Our body also needs water and micronutrients. According to the 2004 Dietary Reference Intakes (DRIs), adult men need about 3.7 liters of water per day, and adult women need about 2.7 liters of water per day. Micronutrients are nutrients that our bodies need in smaller amounts, and include **vitamins** and **minerals**.

Why are foods put together in groups?

For people with **diabetes**, it is important to understand what foods are made of so that blood glucose levels can be more easily controlled. Memorizing the exact amount of carbohydrate in all the foods that we eat would be almost impossible and impractical. Fortunately there are six main food groups:

- The Starch and Starchy Vegetables Group
- The Fruit Group
- The Vegetable Group

- The Meat, Meat Substitutes, Eggs, and Cheese Group
- The Milk and Yogurt Group
- The Fats and Oils Group

It is important to eat foods from each group every day. The type and the amount of food that you chose to eat can have either positive or negative effects on your health.

What counts as a portion or serving?

The amount of food that you eat from the food groups can impact both your weight and blood glucose level. For instance, eating too much food from any food group is likely to cause weight gain. This weight gain can lead to higher blood glucose levels. Eating too much from the starch and starchy vegetables group, the fruit group, or the milk and yogurt group will cause your blood glucose levels to rise if you have diabetes. But how much food is too much, and what is a portion or serving size?

Nutrition Facts			
Serving Size 1 cup (228g)			
Servings Per Container 2			
Amount Per Serving			
Calories 260		Calories from Fat 120	
		% Daily Value*	
Total Fat 13g			20%
Saturated Fat 5g			25%
Trans Fat 2g			
Cholesterol 30mg			10%
Sodium 660mg			28%
Total Carbohydrate 31g			10%
Dietary Fiber 0g			0%
Sugars 5g			
Protein 5g			
Vitamin A 4%	•	Vitamin C 2%	
Calcium 15%	•	Iron 4%	
* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs:			
	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g
Calories per gram:			
Fat 9	•	Carbohydrate 4	• Protein 4

We sometimes think of what we put on our plate as a portion and a serving. While what we put on our plate may be considered a portion, it usually isn't a serving in the way that dietitians think of servings. To care for yourself and your diet, you will need to begin thinking like a dietitian, and recognize that portions and servings are different.

Since portion sizes can vary from person to person, they are not a good measure of how much you should eat in one day. Serving sizes, however, are much more strictly defined and do not vary from person to person. The American Dietetic Association and the American Diabetes Association have set serving sizes for foods in the various food groups. These serving sizes make it easier to identify how many calories, and how much carbohydrate, fat, and protein are in various foods.

It is important to remember that serving sizes may not be the same as the serving sizes listed on Nutrition Facts labels. Companies that make food products, for the most part, are allowed to decide what the serving size on their product should be. This serving size is often based on how much an average person would eat. For instance, a Nutrition Facts label on a package of bread might list one serving as two slices of bread with 110 calories and 21 grams of carbohydrate. However, one serving from the starch group is defined by the American Dietetic Association and the American Diabetes Association as one slice of bread with about

80 calories and 15 grams of carbohydrate. Serving sizes on Nutrition Facts labels vary depending on the product and the company that makes it. For this reason, it is always important to look at the calories and macronutrients as well as the serving sizes listed on the Nutrition Facts labels.

In the Nutrition Facts Label to the left the serving size is 1 cup with 31 grams of carbohydrate. This would be 2 servings from the starch group or 2 carbohydrate units.

The Starch and Starchy Vegetables Group

Foods in this group include cereals, grains, pasta, breads, and crackers. All of these foods are grouped together, because the majority of the calories they contain come from carbohydrates, these foods also contain some protein and sometimes fat. Cooked beans, peas, and lentils also belong in this group, but because they contain more protein they are also part of the meat and meat substitutes group. For this reason, eating one serving of beans, peas or lentils will count as one serving from the starch group and one serving from the meat group. This concept is explained in further detail in the section titled [The Meat and Meat Substitutes Group](#).

People with diabetes do not need to avoid foods found in the starch and starchy vegetables group. In fact, people with diabetes need to eat foods from this group to help meet their daily requirement for calories, macronutrients, fiber, vitamins, and minerals and for overall good health. Foods in this group, however, do contain carbohydrates that can raise blood glucose. It is important to space servings from this group (and the milk and fruit groups) evenly throughout the day, and only eat the number of serving that your doctor or dietitian has recommended. This will help to keep blood glucose levels within your target range.

One Serving from the Starch and Starchy Vegetable Group

One serving from the starch and starchy vegetables group contains about 80 calories, 15 grams of carbohydrate, 3 grams of protein, and 0-1 grams of fat.

Examples of **one** serving from this group would include:

- One slice of bread
- Half of a bun or small bagel
- 1/4 of a baked potato
- 1/3 cup pasta (cooked)
- 1/3 cup rice (cooked)

Starchy vegetables are healthy, but they are higher in carbohydrate than other vegetables and they have more calories. Therefore, these vegetables are grouped with other starchy foods instead of vegetables. One serving of any starchy vegetable is about 1/2 cup cooked vegetable. Starchy vegetables include:

- Corn
- Dried beans
- Lima beans

- Peas
- Potatoes
- Sweet potatoes
- Winter squash

Remember, one serving from this group contains 15 grams of carbohydrate. If you are unsure of how many starch servings a food contains, check the Nutrition Facts label. Look at the total carbohydrates and divide by 15 to find out how many starch servings the product contains. For instance, if the Nutrition Facts label for a package of English muffins says that one English muffin contains 30 grams of carbohydrate, then this would count as two servings from the Starch Group.

Tips for Choosing Foods from the Starch and Starchy Vegetable Group

- Choose starches made with little fat as often as you can. For example, choose a slice of toast instead of a doughnut.
- Choose foods made from whole grains to get more fiber. Whole grain foods include whole wheat bread, whole grain pastas, and whole bran cereal. (Three grams of fiber per serving would be a good fiber choice.)
- Starchy vegetables made with fat count as one serving from the starch group and one serving from the fat group. These foods would include French fries and yams with butter.
- Always check the Nutrition Facts labels of foods the first time you buy them so you will know how many servings from the Starch Group the products contain.

Think About Tortillas

Not all tortillas are equal!

When counting calories and carbohydrates to self-manage your blood sugar levels, know that tortillas are not one in the same. Tortillas can vary in size, shape, color, and texture. Tortillas can range in sizes from a regular 6" (about the size of your hand) to ones larger than your head! If you eat two 6" flour tortillas (220 calories, 42 grams of carbohydrate) this is NOT the same as consuming two 10" flour tortillas (346 calories and 66 grams of carbohydrate). Flour tortillas tend to have more carbohydrate than corn tortillas of the same weight. If you eat **one** 10" flour tortilla, you have consumed 173 calories and 33 grams of carbohydrate (2 carbohydrate exchanges). If you consume **three** 6" corn tortillas, you will have taken in 150 calories and the same amount of carbohydrate (33 grams) as the one 10" flour tortilla. Also, hard-shell tortillas, which have typically been fried in oil, will have more fat and calories than a soft tortilla of the same weight. If you are monitoring your carbohydrate intake to control your blood sugar levels, be sure to read the nutrition facts label on your tortillas. It is typical to eat several tortillas with each meal, so be sure to look at the size and type of tortillas you are consuming.

Example: Tortilla Nutrition Facts

*these are examples — depending on the brand, tortillas can vary significantly in calories, fat, carbohydrate and other nutrients

Type	Corn	Flour	Flour
Diameter	6"	6"	10"
Calories	50	110	173
% fat	10	9	14
Fat (g)	0.5	1	1.5
Sat fat (g)	0	0	0.5
Sodium (mg)	0	286	451
Carbohydrate (g)	11	21	33
Fiber (g)	1	3	5
Protein (g)	1	4	6
Calcium (%DV)	6	6	10
Iron (%DV)	2	3	6

The Fruit Group

Foods in this group include fresh, frozen, canned and dried fruit as well as fruit juices. All fruits are grouped together because all of their calories come from carbohydrates. Fruits contain very little protein and no fat. Although foods with carbohydrates raise blood glucose, people with diabetes do not need to avoid fruits or fruit juice. In fact, it is important that everyone eat at least 2 servings of fruit every day. However, as with other foods, fruits need to be part of the meal plan.

One Serving from the Fruit Group

One serving from the Fruit Group contains about 60 calories and 15 grams of carbohydrate.

Examples of **one** serving from this group would include:

- One small piece of fresh fruit (like an apple or orange that is the size of a tennis ball)
- 1/2 cup of canned or fresh fruit (like fresh pears or peaches canned in water)
- 1/2 cup of unsweetened fruit juice (like unsweetened orange juice)
- 1/3 cup of some fruit juice that is naturally higher in carbohydrates (like prune juice or cranberry juice)
- 1/4 cup dried fruit (like raisins)

Tips for Choosing Foods from the Fruit Group

- Choose fresh fruits more often than canned fruits or fruit juices. Unlike whole fruits, canned fruits and fruit juices are often higher in sugar and calories, and fruit juices usually do not have any fiber.
- When choosing canned fruit, choose fruit canned in its own juice, not a syrup-packed variety. If choosing a generic product that is not labeled as “packed in its own juice” look at the Nutrition Facts label. Talk to your dietitian or health care provider if you have any questions about choosing appropriate canned fruit.
- Dried fruit, when compared to the same amount of fresh or frozen fruit, will always be the higher in calories.
- Read the Nutrition Facts label if you are unsure of how many fruit servings a certain amount of food contains. For fresh fruit that does not have a Nutrition Facts label, follow the above guidelines under the section titled “one serving from the fruit group.”

The Vegetable Group

Foods in this group include vegetables that contain few calories, carbohydrates, and protein. These non-starchy vegetables may be fresh, frozen, or canned vegetables. Vegetable juices are also found in this group.

Non-starchy vegetables are a real nutrition bargain. They are rich in vitamins and minerals. Vegetables are also low in calories and fat, and they are a good source of fiber. Since vegetables are

lower in carbohydrates than fruit, they can often be eaten in much larger servings and more often than fruit.

One Serving from the Vegetable Group

One serving from the vegetable group contains about 25 calories, 2 grams of carbohydrate, and 5 grams of protein.

Examples of one serving from this group would include:

- 1/2 cup cooked vegetables (cooked spinach or cooked broccoli)
- 1 cup raw vegetables (lettuce or mushrooms)
- 1/2 cup of vegetable juice

Tips for Choosing Foods from the Vegetable Group

- Choose fresh or frozen vegetables more often than canned vegetables or vegetable juices.
- Choose plain tomato sauce since this is in the vegetable group instead of ready-made tomato-based pasta sauces (like Ragu®, Prego® or Classico® pasta sauces) that have more carbohydrates. However, always check the Nutrition Facts label, because some pasta sauces may have the same number of calories and carbohydrates as tomato sauce.
- Read the Nutrition Facts label if you are unsure of how many vegetable servings a food contains. For fresh vegetables that do not have a Nutrition Facts label follow the above guidelines under the section titled “one serving from the vegetable group.”

The Meats, Fish, Meat Substitutes, Eggs and Cheese Group

Foods in this group include meats (like beef, chicken, and pork), fish (like salmon, tuna, and shrimp), meat substitutes (like tofu, and products that resemble meat or fish but are made with soy), eggs, and cheese. These foods are grouped together, because the majority of the calories they contain come from protein and/or fat. Cooked beans, peas, and lentils also are in this group because of the protein that they contain, but are also considered starchy vegetables because of their carbohydrate content. While some meat substitutes and cheeses may contain small amounts of carbohydrate, the main macronutrients in these foods are protein and fat. Nuts are also often placed in this group because nuts contain some protein, but they are also high in fat.

Protein is very important in our daily diet. We need protein to maintain muscles, make enzymes, and keep our immune system working well. However, items in this group can be high in calories. Also, meat, eggs, and cheeses in particular can be high in saturated fat and cholesterol. People with diabetes need to make heart-healthy choices when choosing foods from this group because of their increased risk for cardiovascular complications. See the section titled *Eating for Cardiovascular Health*.

One Serving from the Meats, Fish, Meat Substitutes, Eggs and Cheese Group

One serving from the meats, fish, meat substitutes, eggs, and cheese group usually contains about 7 grams of protein, but the amount of calories, carbohydrate, and fat in foods from this group varies depending on the type of food. For instance some meats like salami contain a higher amount of fat than lean meats like chicken. Foods in this group with higher amounts of fat per serving also contain more calories per serving. The carbohydrate content of foods in this group also varies. For instance, meats and eggs do not contain any carbohydrate, but beans and soy do. Chicken and fish will contain less fat than hot dogs or cheese.

Examples of **one** serving from this group would include:

- 1 ounce cooked lean meat, poultry, or fish
- 1 ounce cheese
- 1/2 cup tofu
- 1 egg
- 1 tablespoon of peanut butter
- 1 ounce of soyburger

The serving sizes of foods in this group are very small. Since not many people eat one ounce of meat or cheese at a time, 3 servings (3 ounces) of food from this group is usually considered to be a portion. Ask your health care provider or dietitian how many servings you should eat from this group every day.

Nuts, Beans, and Soy Products

Nuts, beans, and some soy products are good sources of fiber since they are also vegetables, or legumes. Although nuts contain both fiber and protein, they are also high in fat. When nuts are eaten in smaller amounts, they are usually considered to be a serving from the fat group, but when they are eaten in larger amounts they are considered a serving of high-fat meat. For instance ½ tablespoon of peanut butter is considered to be one serving from the fat group, but one tablespoon of peanut butter is considered one serving from the meat and meat substitutes group. Like nuts, soybeans and beans contain both carbohydrate and protein. Unlike nuts, however, they are usually low in fat. One cup of whole soybeans or beans contains about 8 grams of fiber. Processing will lower the fiber content of some soy products, such as tofu.

Tips for Choosing Foods from Meats, Fish, Meat Substitutes, Eggs and Cheese Group

- Choose foods from this group that have between 35 and 60 calories and 0-3 grams of fat per serving whenever possible to reduce your saturated fat and total fat intake. Fish and skinless white meat poultry are good choices, as are lean whole meats like lean pork chops or lean steaks.
- Read Nutrition Facts labels carefully. If any product contains close to 15 grams of carbohydrate as well as 7 grams of protein per serving, it would count as both a meat and starch serving.
- Choose foods from this group that are low in cholesterol such as poultry, meat substitutes made from soy, or some beef items.

The Milk and Yogurt Group

Foods in this group include milk and yogurt. These foods are grouped together, because they contain similar amounts of carbohydrate and fat. While milk and yogurt usually contain similar amounts of protein and carbohydrates, they can vary in their fat content.

One Serving from the Milk and Yogurt Group

One serving from the **Milk and Yogurt Group** usually contains about 12 grams of carbohydrate and 8 grams of protein, but the amount of fat and calories in these foods varies. For instance, one cup of fat-free milk contains about 90 calories and 0 grams of fat, but one cup of whole milk contains about 150 calories and 8 grams of fat. Check the Nutrition Facts labels of these products to identify the amount of calories and fat that they contain.

Examples of one serving from this group would include:

- 1 cup milk (fat-free, ½%, 1%, 2% or whole)
- 1 cup soy milk (low fat, or fat-free)
- 2/3 fat-free yogurt (flavored or plain)
- 3/4 cup low-fat yogurt

Tips for Choosing Foods from the Milk and Yogurt Group

- Choose fat-free, low-fat, or reduced-fat products from this group whenever possible. These products contain less fat and fewer calories.
- Read the Nutrition Facts labels of yogurts carefully. Yogurt cups often vary in size so it is important to check the serving size of yogurts. Also, the calorie content of yogurt varies quite a bit, because some companies add sugar, syrup, artificial sweeteners, and/or fruit.
- Read the Nutrition Facts label if you are unsure of how many milk or yogurt servings a certain amount of food contains.

The Fats and Oils Group

Foods in this group include butter, margarine, salad dressing, mayonnaise, sour cream, oils, lard, and nuts. The foods in this group are grouped together because they contain similar amounts of calories and fat per serving and, with the exception of nuts, contain little protein or carbohydrates. Although fat is often thought of as being unhealthy for you, fat is essential for life. We need a certain amount of fat each day. The hard part is deciding what types and how much fat to eat.

There are four main types of fat, polyunsaturated, monounsaturated, trans, and saturated fats. All of these names describe the chemical structure of the different fats. Most foods contain a mixture of these four types of fats, but they are grouped by the type of fat that is present in the largest amount. While it is true that all fat is high in calories and that too much of any type of fat may be unhealthy, some types of fat are better for you than others. Saturated and trans fats have been

shown to increase the risk for heart disease, but polyunsaturated and monounsaturated fats have been shown to have no effect on or decrease the risk for heart disease. See the section titled *Eating for Cardiovascular Health*.

One Serving from the Oils and Fats Group

One serving from the Oils and Fats Group contains about 45 calories and 5 grams of fat. Examples of one serving of monounsaturated and/or polyunsaturated fats include:

- 1 teaspoon margarine
- 1 teaspoon mayonnaise
- 1 tablespoon reduced-fat mayonnaise
- 1 teaspoon oil (corn, canola, vegetable)
- 1 tablespoon salad dressing
- 2 tablespoons reduced-fat salad dressing
- 6 almonds
- 10 peanuts

Examples of one serving of saturated fats include:

- 1 teaspoon butter
- 1 teaspoon shortening or lard
- 2 tablespoons sour cream
- 3 tablespoons reduced-fat sour cream
- 1 tablespoon cream cheese

Tips for Choosing Foods from the Fats and Oils Group

- Choose foods that contain more polyunsaturated or monounsaturated fats rather than foods that contain saturated or trans fats. 1 teaspoon shortening or lard
- Choose low-fat or reduced-fat options when calories are similar to or less than the full fat product. Sometimes the fat in low-fat products is replaced with carbohydrate, making a low-fat product that is still high in calories. For this reason, it is always important to check the calorie and macronutrient content of low-fat foods.
- Read the Nutrition Facts labels of foods to see how many grams of fat the products you consume contain.

Read the Nutrition Facts label if you are unsure of how many fat or oil servings a certain amount of food contains.

