

Managing Carbohydrates with the Exchange Lists

People with diabetes have special dietary needs, but they do not need special foods. An overall healthy diet that is good for everyone else is also good for people with diabetes.

Carbohydrate, protein and fat are the three nutrients that provide us with energy, which is measured in calories. Foods can be divided into groups based on their carbohydrate, protein and fat contents. When we eat food, especially carbohydrate foods, it is turned into glucose. Glucose is the favorite source of energy for our body's cells. Glucose needs a hormone called insulin in order for glucose to get inside the cells. Insulin is made in the pancreas. If a person has diabetes, either their pancreas does not make any insulin, doesn't make enough insulin or the body doesn't use insulin like it should. Whatever the case, glucose cannot get into the cells and builds up in the blood. This can cause high blood sugar, which can lead to serious complications.

Blood glucose levels can be kept near normal levels if we balance the food we eat, especially carbohydrate foods, with regular physical activity and the insulin the body makes or that is injected. Regularly monitoring blood glucose gives information to help with the balancing act.

It is a good idea for people with diabetes to eat about the same amount of carbohydrate around the same time every day. It is a bad idea to skip meals because it can lead to low blood sugar. Between-meal snacks are an important part of a diabetes food plan. Snacks can help keep blood sugar from going too low.

Just like everyone else, a person with diabetes needs to eat a variety of foods that contain the nutrients they need in the right amounts for good health. As a general rule, for adults, a healthy meal plan includes *at least*:

- 2 cups of non-starchy vegetables
- 1½ cups of fruit
- 5 ounces of grains, beans or starchy vegetables
- 3 cups of low-fat or fat-free milk
- 5 ounces of meat or meat substitutes
- *Small* amounts of fat and sugar

The actual amounts from each food group will depend on a person's calorie needs, which depend on age, gender, size and activity level. A doctor or dietitian should help decide how many calories are right for each individual.

Food exchange lists can be helpful when planning meals that meet your carbohydrate and other nutrient needs. The three main groups are based on the three energy nutrients:

- **carbohydrate** (starch, fruits, milk, sweets and non-starchy vegetables)
- **protein** (meat and meat substitutes)
- **fat** (fats and oils).

Each food list contains foods grouped together because they have similar nutrient content and serving sizes. Each serving has about the same amount of carbohydrate, protein, fat and calories as other foods on the same list.

Foods on the **Starch** list, **Fruit** list, **Milk** list, and **Sweets, Desserts and other**

Carbohydrates list contain 12 to 15 grams of carbohydrate per specified serving.

- Foods on the **Fat** list and **Meat and Meat Substitutes** list generally do not contain carbohydrate. Exceptions are plant-based meat substitutes like beans and lentils.
- Starchy vegetables, like potatoes, corn and peas, are on the **Starch** list because they contain about 15 grams of carbohydrate per serving.
- Foods on the Non-starchy Vegetables list like broccoli, tomatoes and carrots, contain only 5 grams of carbohydrate per serving.

- Some foods have such a small amount of carbohydrates that they are considered “free” if eaten in small amounts. You will find these on the **Free Foods** list.
- Other foods, like lasagna or cheese burger, contain a combination of foods and are on the **Combination Food** list or the Fast Foods list.

As you are learning how to use the lists, talk to your health care team, especially a registered dietitian, about any concerns. Your meal plan can be adjusted to fit your lifestyle. The goal is for you to make healthy food choices for a lifetime.

Food Lists

	Carbohydrates (grams)	Protein (grams)	Fat (grams)	Calories (kcal)
Carbohydrates				
Starch: breads, cereals, other grain foods, starchy vegetables, crackers, snacks, beans, peas, and lentils	15	0-3	0-1	80
Fruits	15	-	-	60
Milk				
Fat-free, low-fat, 1%	12	8	0-3	100
Reduced-fat, 2%	12	8	5	120
Whole	12	8	8	160
Sweets, Desserts, and Other Carbohydrates	15	varies	varies	varies
Non-starchy Vegetables	5	2	-	25
Meat and Meat Substitutes				
Lean	-	7	0-3	45
Medium-fat	-	7	4-7	75
High-fat	-	7	8+	100
Plant-based proteins	varies	7	varies	varies
Fats	-	-	5	45
Alcohol	varies	-	-	100

Starch List

Cereals, grains, pasta, breads, crackers, snack chips, starchy vegetables, and cooked beans, peas and lentils are on the starch list. In general, 1 starch is:

- ½ cup cooked cereal, grain or starchy vegetable
- ½ cooked rice or pasta
- 1 ounce of a bread product such as 1 slice of bread
- ¼ ounce to 1 ounce of most snack foods

A choice on the **Starch** list has **15 grams of carbohydrate**, 0-3 grams of protein, 0-1 grams of fat and 80 calories. Everyone should eat 3 or more servings of whole grains each day.

Whole grains and whole-grain products contain the entire grain seed of plant. They are rich in fiber, vitamins, minerals and phytochemicals.

- Whole-grain foods include: whole-wheat flour, whole oats/oatmeal, whole-grain cornmeal, popcorn, buckwheat, buckwheat flour, whole rye, whole-grain barley, brown rice, wild rice, bulgur, millet, quinoa, and sorghum.
- Choose whole-grain foods most of the time.
- Read food labels. If a product says **100% whole grain**, it must contain at least 16 grams of whole grain per serving.
- A whole grain stamp identifies foods that have at least ½ serving of whole grains (3 grams of whole grains)

Choose low-fat starches most of the time. As a general rule, a serving of starchy food is one ounce. Always check the portion size you eat. Some foods have a lot more carbohydrate than you might think. For example, a large bagel may weigh 4 ounces and equal 4 carbohydrate servings. Read the Nutrition Facts panel on food labels for specific information.

Starch List Serving Size	Serving Size
Bread	
Bagel	½ (1 ounce)
Bread: whole-wheat, rye, white, pumpernickel	1 slice
Bread (reduced-calorie)	2 slices
English muffin	½
Hot dog or hamburger bun	½
Pancake, 4 inches across	1
Pita, 6 inches across	1
Roll, plain, small	1 (1 ounce)
Stuffing	⅓ cup
Taco shell	2
Tortilla, corn, 6 inches across	1
Tortilla, flour, 6 inches across	1
Waffle, 4 inches across	1

Starch List Continued	Serving Size
Cereals and Grains	
Bran, dry	¼ cup
oat	½ cup
wheat	½ cup
Barley, couscous, polenta, quinoa, pasta, rice, cooked	⅓ cup
Bulgur, grits, wild rice, cooked	½ cup
Granola (low-fat or regular)	¼ cup
Wheat germ, dry	3 tablespoons
Cereals	
bran	½ cup
cooked	½ cup
puffed	1½ cup
shredded wheat, plain	½ cup
sugar coated	½ cup
unsweetened, ready-to-eat	¾ cup
Starchy Vegetables	
Corn	½ cup
on cob, large	½ cob
Hominy, canned	¾ cup
Mixed vegetables with corn, peas or pasta	1 cup
Parsnips	½ cup
Peas, green	½ cup
Potato	
baked with skin	¼ large
boiled	½ cup
mashed with milk and fat	½ cup
French fries, oven baked	1 cup (2 ounces)
Pumpkin, canned no sugar added	1 cup
Spaghetti/pasta sauce	½ cup
Squash, winter	1 cup
Yam, sweet potato, plain	½ cup
Crackers and Snacks	
Animal crackers	8
Crackers	
round butter type	6
saltines	6
sandwich style, cheese or peanut butter filling	3
whole-wheat regular, whole-wheat lower fat or crispbreads	2-5 (¾ ounce)
Graham cracker 2½ inch square	3
Popcorn	3 cups
Pretzels	¾ ounce
Rice cakes, 4 inches across	2
Snack chips	
fat-free or baked tortilla or potato, baked pita	15-20 (¾ ounce)
regular tortilla or potato	9-13 (¾ ounce)

Starch List Continued	Serving Size
Beans, Peas and Lentils	
Baked beans	1/3 cup
Beans, lentils, and peas, cooked (black, garbanzo, kidney, lima, navy pinto, white; black-eye, split)	1/2 cup
Refried beans, canned	1/2 cup

Fruit List

Fresh, frozen, canned and dried fruits and fruit juices are on the **Fruits** list.

In general, 1 fruit choice is:

- 1/2 cup of canned or fresh fruit or unsweetened fruit juice
- 1 small fresh fruit (4 ounces)
- 2 tablespoons of dried fruit

A choice on the **Fruits** list has **15 grams of carbohydrate**, 0 grams of protein, 0 grams of fat and 60 calories. Fresh frozen and dried fruits are good sources of fiber. Fruit juices contain very little fiber. Choose fruits instead of juices most of the time. Citrus fruits, berries and melons are good sources of vitamin C. It is a good idea to use a food scale to weigh fresh fruits so that you will be able to “eyeball” a proper serving.

Read the Nutrition Facts on the food label for serving size and carbohydrate content. If one serving has more than 15 grams of carbohydrate, you may need to adjust the size of the serving. Portion sizes for canned fruit are for the fruit and a small amount of juice (1-2 tablespoons). Food labels on canned fruits may contain the words “no sugar added” or “unsweetened”. This means that no table sugar has been added – it does not mean the food contains no sugar (fruits naturally contain sugar). Fruit canned in “extra light syrup” has the same amount of carbohydrate per serving as “no sugar added” or “juice pack”. The canned fruits on the **Fruits** list are based on one of those three types of pack. Avoid fruit packed in heavy syrup.

Fruit List	Fruit List Serving Size
Apple, unpeeled, small	1 (4 ounces)
Apples, dried	4 rings
Applesauce	1/2 cup
Apricots canned dried fresh	1/2 cup 8 halves 4 whole (5 1/2 ounces)
Banana, extra small	1 (4 ounces)
Blackberries, blueberries	3/4 cup
Cantaloupe, small	1/3 melon or 1 cup cubed
Cherries sweet, canned sweet, fresh	1/2 cup 12 (3 ounces)
Dates	3
Dried small fruits such as raisins	2 tablespoons

Fruit List Continued	Serving Size
Figs dried fresh	1½ 1½ large or 2 medium
Fruit cocktail	½ cup
Grapefruit large sections	½ ½
Grapes, small	17 (3 ounces)
Honeydew melon	1 slice or 1 cup cubed
Kiwi	1 (3½ ounces)
Mandarin oranges, canned	¾ cup
Mango, small	½ fruit or ½ cup
Nectarine, small	1 (5 ounces)
Orange, small	1 (6½ ounces)
Papaya	½ fruit or 1 cup cubed
Peaches canned fresh, medium	½ cup 1 (6 ounces)
Pears canned fresh, large	½ cup ½ (4 ounces)
Pineapple canned fresh	½ cup ¾ cup
Plums canned dried (prunes) small	½ cup 3 2 (5 ounces)
Raspberries, fresh	1 cup
Strawberries, fresh	1¼ cup whole berries
Tangerines, small	2 (8 ounces)
Watermelon	1 slice or 1¼ cup cubes

Milk List

Different types of milk products are on the **Milk** list. Two types of milk products are on other lists. For a person with diabetes, cheeses are on the **Meat and Meat Substitutes** list because they are rich in protein. Cream, cream cheese, sour cream, butter and butter spreads are on the **Fats** list.

Milks and yogurts are grouped in three categories based on the amount of fat they have:

- fat-free/low-fat
- reduced-fat
- whole

The chart on page 2 shows the difference in fat and calorie content of the three types of milk. The higher the fat content, the more saturated fat and cholesterol it has. Children over the age of 2 and adults should choose lower-fat varieties such as fat-free, 1%, and 2% milks or yogurts. One cup of milk equals 8 fluid ounces or ½ pint.

Milk List	Serving Size	Count as
Fat-free or low-fat (1%)		
Milk, buttermilk, acidophilus milk, Lactaid	1 cup	1 fat-free milk
Evaporated fat-free milk	½ cup	1 fat-free milk
Yogurt, plain or flavored with an artificial sweetener	⅔ cup (6 ounces)	1 fat-free milk
Reduced-fat (2%)		
Milk, acidophilus milk, kefir, Lactaid	1 cup	1 cup 1 reduced-fat milk
Yogurt, plain	⅔ cup (6 ounces)	1 reduced-fat milk
Whole		
Milk, buttermilk, goat's milk	1 cup	1 whole milk
Evaporated milk	½ cup	1 whole milk
Yogurt, plain	8 ounces	1 whole milk
Dairy-like foods		
Chocolate milk		
fat-free	1 cup	1 fat-free milk + 1 carb
whole	1 cup	1 whole milk + 1 carb
Eggnog, whole	½ cup	1 carb + 2 fats
Rice drink		
flavored, low-fat	1 cup	2 carbs
plain, fat free	1 cup	1 carb
Smoothies, flavored, regular	10 ounces	1 fat-free milk + 2½ carbs
Soy milk		
light	1 cup	1 carb + ½ fat
regular, plain	1 cup	1 carb + 1 fat
Yogurt and juice blends	1 cup	1 fat-free milk 1 carb
low carbohydrate (<6 grams/choice)	⅔ cup (6 ounces)	½ fat-free milk
with fruit, low-fat	⅔ cup (6 ounces)	1 fat-free milk + 1 carb

Non-starchy Vegetables

Vegetables with small amounts of carbohydrates and calories are on the **Non-starchy Vegetables** list. Vegetables contain many important nutrients. Try to eat at least 2-3 non-starchy vegetable choices every day. In general, 1 non-starchy vegetable choice is:

- ½ cup of cooked vegetables or vegetable juice
- 1 cup of raw vegetables

If you eat 3 or more cups of raw non-starchy vegetables or 1½ cups of cooked vegetables in a meal, count them as 1 carbohydrate choice. A choice on the non-starchy vegetable list (½ cup cooked or 1 cup raw) equals 5 grams of carbohydrates, 2 grams of protein, 0 grams of fat and

25 calories. Fresh and frozen vegetables have less added salt than canned vegetables. Drain and rinse canned vegetables to remove some salt.

Choose *dark green* and *dark yellow* vegetables each day. Good choices are spinach, broccoli, romaine, carrots, chilies, squash, and peppers. Brussels sprouts, broccoli, cauliflower, greens, peppers, spinach, and tomatoes are good sources of vitamin C.

Eat *cruciferous vegetables* several times a week. Cruciferous vegetables include bok choy, broccoli, Brussels sprouts, cabbage, cauliflower, collards, kale, kohlrabi, rutabaga, turnip and watercress. Salad greens are so low in carbohydrate that they are on the Free Foods list.

Non-starchy Vegetables

Artichoke	Coleslaw, no dressing	Radishes
Artichoke hearts	Cucumber	Rutabaga
Asparagus	Eggplant	Sauerkraut
Baby corn	Green onions	Soybean sprouts
Bamboo shoots	Jicama	Spinach
Beans (green, wax, Italian)	Kohlrabi	Squash, summer, crookneck, zucchini
Bean sprouts	Leeks	Sugar snap peas
Beets	Mixed vegetables without corn, peas, or pasta	Swiss chard
Broccoli	Mung bean sprouts	Tomato
Brussels sprouts	Mushrooms, all kinds, fresh	Tomatoes, canned
Cabbage (green, bok choy, Chinese, red)	Okra	Tomato sauce
Carrots	Onions	Tomato/vegetable juice
Cauliflower	Pea pods	Turnips
Celery	Peppers	Water chestnuts

Free foods are food or drink choices that have less than 20 calories and 5 grams or less of carbohydrates per serving. It is a good idea to limit free foods to 3 servings per day and spread them throughout the day. **A food or beverage listed without a serving size can be eaten whenever you like.**

Free Foods List

Free Food List	Serving Size
Low Carbohydrate Foods	
Cabbage, raw	½ cup
Candy, hard, regular or sugar-free	1 piece
Cranberries, sweetened with sugar substitute	½ cup
Cucumber, sliced	½ cup
Gum	

Free Food List Continued	Serving Size
Jam and jelly, light or no sugar added	2 teaspoons
Rhubarb, sweetened with sugar substitute	½ cup
Salad greens	
Sugar substitutes	
Syrup, sugar-free	2 tablespoons
Condiments	
Barbecue sauce	2 teaspoons
Catsup	1 tablespoon
Honey mustard	1 tablespoon
Horseradish	
Lemon juice	
Mustard	
Parmesan cheese, freshly grated	1 tablespoon
Pickle relish	1 tablespoon
Pickles dill sweet, bread and butter sweet gherkin	1½ medium 2 slices ¾ ounce
Salsa	
Soy sauce, light or regular	1 tablespoon
Sweet and sour sauce	2 teaspoons
Sweet chili sauce	2 teaspoons
Taco sauce	1 tablespoon
Vinegar	Vinegar
Yogurt, any type	2 tablespoons
Drinks/Mixes	
Bouillon, broth, consommé, carbonated mineral water, club soda, diet soda, sugar-free drink mixes, coffee, tea, tonic water (diet), water	

Meat and Meat Substitutes

Meat and meat substitutes are rich in protein. Whenever possible, choose lean meats. Read food labels to find “hidden” carbohydrates. Hot dogs and some processed meats, seafood and soy products contain carbohydrates. If the amount of carbohydrate is near 15 grams, count it as one carbohydrate choice. If it is more or less than 15 grams count it accordingly or adjust the serving size. Meat and fish that is breaded contains carbohydrate. Count 3 tablespoons of cornmeal, flour or bread crumb breading as 15 grams of carbohydrate.

Carbohydrate-Containing Meat Substitute List		
Food	Amount	Count as
“Bacon” strips, soy-based	3 strips	1 medium-fat meat
Baked beans	⅓ cup	1 starch + 1 lean meat

Carbohydrate-Containing Meat Substitute List Continued

Food	Amount	Count as
Beans, cooked, black, white, garbanzo, kidney, pinto, navy, lima	½ cup	1 starch + 1 lean meat
“Beef” or “sausage” crumbles, soy-based	2 ounces	½ carbohydrate + 1 lean meat
“Chicken” nuggets, soy-based	2 nuggets	½ carbohydrate
Hot dog, soy-based	1 (1½ ounces)	½ carbohydrate + 1 lean meat
Hummus	⅓ cup	1 carbohydrate + 1 high-fat meat
Lentils	½ cup	1 carbohydrate + 1 lean meat
Meatless burger, soy-based	3 ounces	½ carbohydrate + 2 lean meats
Meatless burger, vegetable- and starch-based	1 patty	1 carbohydrate + 2 lean meats
Nut spreads, almond, cashew, peanut and soy nut butters	1 tablespoon	1 high-fat meat
Peas, cooked: black-eyed and split peas	½ cup	1 starch + 1 lean meat
Refried beans, canned	½ cup	1 starch + 1 lean meat
“Sausage” patties, soy-	1 (1½ ounces)	1 medium-fat meat
Soy nuts, unsalted	¾ ounce	½ carbohydrate
Tofu	4 ounces (½ cup)	1 medium-fat meat
Tofu, light	4 ounces (½ cup)	1 lean meat

Lean Meats and Meat Substitutes

Food	Amount
Beef: Select or Choice grades trimmed of fat: Ground round, roast, (chuck, rib, roast) round, sirloin Steak (cubed, flank, porterhouse, T-bone, tenderloin)	1 oz.
Cheeses with 3 grams of fat or less per ounce	1 oz.
Cottage cheese	
Egg substitute, plain	¼ cup
Egg whites	2
Fish, fresh, frozen, plain: catfish, cod, flounder, haddock, halibut, orange roughy, salmon, tilapia, trout, tuna	1 oz.
Fish, smoked: herring or salmon (lox)	1 oz.
Game: buffalo, ostrich, rabbit, venison	1 oz.
Hot dog with 3 grams of fat or less per oz. (may be high in carbohydrates)	1
Lamb; chop, leg, roast	1 oz.
Organ meats: heart, kidney, liver (may be high in cholesterol)	1 oz.
Oysters, fresh or frozen	6 medium
Pork, lean	1 oz.
Canadian bacon, rib or loin chop/roast, ham, tenderloin	1 oz.
Poultry, without skin,: Cornish hen, chicken, domestic duck or goose (well-drained of fat), turkey	1 oz.

Lean Meats and Meat Substitutes continued	
Food	Amount
Processed sandwich meats with 3 grams of fat or less per oz.: chipped beef, deli thin-sliced meats, turkey, ham, turkey kielbasa, turkey pastrami	1 oz.
Salmon, canned	1 oz.
Sardines, canned	2 medium
Sausage with 3 grams of fat or less per oz.	1 oz.
Shellfish: clams, crab, imitation shellfish, lobster, scallops, shrimp	1 oz.
Tuna, canned in water or oil	1 oz.
Veal, lean chop, roast	1 oz.

Medium-Fat Meat and Meat Substitutes

Food	Amount
Beef: Corned beef, ground beef, meatloaf, Prime grades trimmed of fat (prime-rib) short ribs, tongue	1 oz.
Cheeses with 4-7 grams of fat per oz.: feta, mozzarella, pasteurized processed cheese spread, reduced-fat chees, string cheese	1 oz.
Egg (high in cholesterol)	1
Fish, any fried product	1 oz.
Lamb: ground, rib roast	1 oz.
Pork: cutlet, shoulder roast	1 oz.
Poultry: chicken with skin; dove, pheasant, wild duck or goose, fried chicken; ground turkey	1 oz.
Ricotta cheese	2 oz. or ¼ cup
Sausage with 4-7 grams of fat per oz.	1 oz.
Veal, cutlet (no breading)	1 oz.

High-Fat Meat and Meat Substitutes

Food	Amount
Bacon	
Pork	2 slices
Turkey	3 slices
Cheese, regular: American, bleu, brie, cheddar, hard goat, Monterey jack, queso, Swiss	1 oz.
Hot dog: turkey or chicken 10 per 1 pound package	1
Pork: ground, sausage, spareribs	1 oz.
Processed sandwich meats with 8 grams of fat or more per oz.: bologna, pastrami, hard salami	1 oz.
Sausage with 8 grams of fat or more per oz.: bratwurst, chorizo, Italian, knockwurst, Polish, smoked, summer	1 oz.

Combination Foods

Many of the foods we eat are mixtures with foods from one or more food groups. These combination foods do not fit into any one choice list. To figure out the amount of carbohydrate in recipes, find the carbohydrate grams for each ingredient, add them together then divide the total by the number of servings in the recipe. A good resource for calculating the carbohydrate content of many foods is:

<http://www.nal.usda.gov/fnic/foodcomp/Data/SR18/nutrlist/sr18a205.pdf> or
<http://nutritiondata.self.com/>

Adapted from: Choose Your Foods: Exchange Lists for Diabetes.
The American Diabetes Association and American Dietetic Association. 2008.