

Carbohydrate Counting

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What is Carbohydrate Counting?

Carbohydrate (carb) counting is a way of keeping track of the amount of carbohydrates you get from the foods you eat. Carbohydrate counting can help you manage your blood glucose levels.

Food is a combination of protein, fats and carbohydrates. Carbohydrates, which include sugars and starches, have the greatest effect on blood glucose. Carbohydrates in foods are changed into glucose in the body about 1 to 1½ hours after you eat them. Eat carbs in small amounts several times a day to keep blood glucose as close to normal as possible. Fats and protein do not raise blood glucose, but a person with diabetes should limit their intake of these nutrients to help control calories.

Carbohydrates are found in all plant foods (for example, fruits, vegetables, grains, beans and peas). Sweets such as candies, cakes, cookies and sugary drinks also contain carbohydrates. Try to limit sweets as they provide few other nutrients.

Benefits of Carbohydrate Counting

Counting carbs will help you

- Spread your carbohydrate intake across the day
- Manage your weight
- Keep your blood glucose under control

Steps in Carbohydrate Counting

1. Know the foods that contain carbohydrates.

- Breads, cereals, crackers, biscuits, pasta, tortillas, bagels, pita bread
- Grains (rice, corn, wheat, oats, bulgur, couscous)
- Dried beans (red, navy, black, garbanzo and pinto beans) and soy products
- Starchy vegetables (potato, corn, peas, winter squash and pumpkin)

- Fruits (fresh, canned, dried) and fruit juices
- Milk and yogurt
- Others
 - > Sweets such as candies, jams and jellies
 - > Snack foods such as chips and pretzels
 - > Desserts such as cookies, pies, ice cream and puddings
 - > Sugary drinks such as sodas, juice drinks and sweet tea

2. Know what counts as a serving of carbohydrate foods. A serving contains 15 grams of carbohydrates.

- See Food Lists for Carbohydrate Counting (Table 1).
- Use measuring cups and spoons or a food scale to check serving sizes.
- Read the Nutrition Facts on food labels to find out how many grams of carbohydrate are in the foods you eat.
- Count one serving of combination foods such as pizza, casseroles, and soups as two carbohydrate servings.



The two most important areas of the Nutrition Fact Panel for carbohydrate counting are the Serving size and Total Carbohydrate.

3. Know what foods are considered “free.” These foods are not counted toward the carbohydrate total.
 - Sugar-free soft drinks, unsweetened tea or coffee (no milk added), gelatin and broth.
 - Raw vegetables
 - > Count up to 1 cup of raw vegetables or ½ cup cooked nonstarchy vegetables as free.
 - > Three or more servings of these “free” foods at one meal count as 1 carbohydrate serving. For example, if you eat 1½ cups of cooked carrots at a meal it counts as 1 carbohydrate serving.
 - Foods that contain less than 20 calories or 5 grams of carbohydrate per serving
4. Take action! Count the amount of carbohydrate in the food you eat.
 - Write down what you eat and drink during the day, including snacks. Write the amount of carbohydrate in each food you eat; then add the carbohydrate from each food to get a total for the day.
 - Evaluate how you are doing in terms of meeting your goals.
5. Check to see how a certain meal affects you by taking your blood glucose level before you eat and 2 hours after the meal.

Using Food Labels to Count Carbohydrates

- Reading food labels is a great way to know how much carbohydrate is in a food. The two most important areas of the Nutrition Fact Panel for carbohydrate counting are the Serving size and Total Carbohydrate.
- The Serving Size tells you what is considered a serving for the particular food. This could be more or less than the serving size on the Food List for Carbohydrate Counting.
- If you eat more or less than the serving size on the food package, calculate the amount of Total Carbohydrate that you actually ate.

How to Calculate the Number of Carbohydrate Servings from the Food Label

- Look for the serving size on the label.
- Look at the total grams of carbohydrate; this is the amount of carbohydrate you will get in one serving of the food.
- If a food has more than 5 grams of fiber, subtract the grams of fiber from Total Carbohydrate. Although fiber is counted as a carbohydrate, it does not raise blood glucose.

For example:

- > The serving size on the label is 1 cup.
- > The total carbohydrate is 31 grams.
- > A serving contains 0 grams of dietary fiber, so do not subtract it from Total Carbohydrate.
- > A ½ cup serving of this food has just over 15 grams of carbohydrate, which is one carbohydrate serving.
- > Ignore the grams of sugars listed on the label because they are included in the total grams of carbohydrate.

Nutrition Facts	
Serving Size 1 cup (228g)	
Servings Per Container 2	
Amount Per Serving	
Calories 250	Calories from Fat 110
% Daily Value*	
Total Fat 12g	18%
Saturated Fat 3g	15%
Trans Fat 3g	
Cholesterol 30mg	10%
Sodium 470mg	20%
Total Carbohydrate 31g	10%
Dietary Fiber 0g	0%
Sugars 5g	
Protein 5g	
Vitamin A	4%
Vitamin C	2%
Calcium	20%
Iron	4%

Sample food label.

Other Parts of the Food Label to Consider

Saturated and Trans Fat

Individuals with diabetes are more likely to develop heart disease.

Choose foods that are low in saturated and trans fat to lower your risk for heart disease. In general, 5 percent daily value or less is low. Twenty percent or more is high.

Sodium

Individuals with diabetes are more likely to develop high blood pressure.

Choose foods that are low in sodium. Five percent daily value (120 mg) or less of sodium per serving is low while 20 percent (480 mg) is high.

Calories

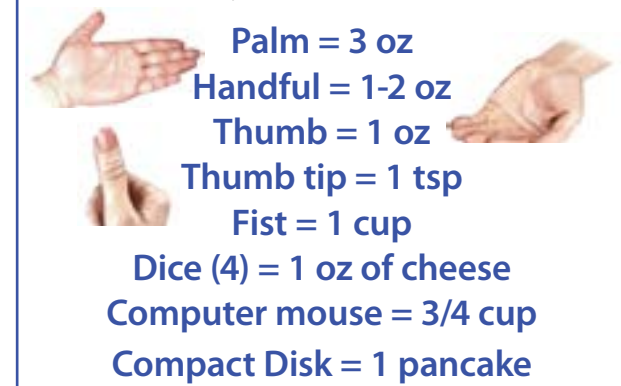
Losing weight can help some people control their blood glucose. Balancing calories eaten with physical activity can help you reach or maintain a healthy body weight.

- Pay attention to the number of calories per serving on food labels.
- Choose foods that are lower in calories, or reduce your portion size.
- Select low-calorie foods that are rich in vitamins and minerals for a healthy diet.

Meal Planning Tips

- A Registered Dietitian (RD) can help you develop a meal plan that is right for you. You also can learn about basic carbohydrate counting by attending a diabetes self-management education program. Check with your doctor for a referral to an RD and/or a program to help you manage your diabetes.
- Most people will plan to eat 3 to 5 carbohydrate servings at each meal, which is 45 to 75 grams of carbohydrates.
 - > Women generally need 3 to 4 carbohydrate servings and men 4 to 5 carbohydrate servings for each main meal.
 - > If you are trying to lose weight, go for the lower number of servings.
 - > If you are very active, you may need the higher number of servings.
- Allow 1 to 2 carbohydrate serving(s) for each snack.

Handy Portion Guides



- Use mostly whole grain products such as whole wheat bread, oatmeal, brown rice, and whole grain cereals. Make sure the first ingredient on the label is a whole grain.
- Eat 5 to 7 ounces of lean meat or other protein foods such as cooked dried beans (black, red, pinto, garbanzos or soybeans) each day.
- Use healthy fats such as olive oil and canola oil in salad dressings and for cooking.
- Eat as little trans fat as possible, and keep saturated fat low. Trans fats are found in commercial baked goods (such as cakes, cookies and crackers), fried foods (such as doughnuts and French fries) and fats (such as shortening, hard margarines and partly hydrogenated vegetable oils).
- Cut back on your salt intake. Use food labels to identify the sodium content of foods.
- Check your blood glucose level regularly to see if you need to adjust the timing of your meals.
- Keep a record of the food you eat and your blood glucose levels to see which foods cause your blood glucose levels to rise quickly.
- The blood glucose control goals set by you and your health-care team will help you monitor your carbohydrate intake.
- The amount of carbohydrate a person needs depends on:
 - > Body weight
 - > Level of physical activity
 - > Diabetes medication
- Remember the big picture for eating with diabetes: Eat an overall healthy diet while keeping track of carbohydrates to better manage your blood glucose.

Table 1. Food List for Carbohydrate Counting.

Item	Serving size (1 serving = approximately 15 grams of carbohydrates)
Breads, Grains and Other Starches	
white or whole-grain bread	1 slice, 1 oz
biscuit	1 biscuit, 2½-inch diameter
corn bread	1½ oz
bagel	¼ large, 1 oz
English muffin	½ muffin
pancake	4-inch diameter, ¼ inch thick
waffle	4-inch diameter or square
hamburger or hot dog bun	1 oz
corn or flour tortilla	6-inch diameter
taco shell	5-inch diameter
pita bread	6-inch diameter
sugar-coated cereal	½ cup
unsweetened ready-to-eat cereal	¾ cup
shredded wheat cereal	½ cup
cooked cereal, oatmeal or grits	½ cup
Graham crackers	2½-inch square
butter type or saltine crackers	6 crackers
whole wheat regular or low-fat crackers	2-5 crackers, ¾ oz
snack chips, fat-free or baked tortilla, potato or baked pita chips	15-20 chips, ¾ oz
pretzels	¾ oz
popcorn, plain	3 cups
rice cakes	2 cakes
pasta, cooked	⅓ cup
white or brown rice, cooked	⅓ cup
beans	½ cup
green peas	½ cup
corn	½ cup
corn on the cob	½ cob
potato, baked with skin	¼ large, 3 oz
potatoes, mashed or boiled	½ cup
potato, French fried, oven-baked	1 cup, 2 oz
sweet potato or yam	½ cup
winter squash, acorn or butternut	½ cup
broth-based soup	1 cup

Table 1. Food List for Carbohydrate Counting.

Item	Serving size (1 serving = approximately 15 grams of carbohydrates)
Fruit	
apple, unpeeled	1 small, 4 oz
banana	1 extra small, 4 oz
grapefruit	½ large, 11 oz
grapes	7 grapes, 3 oz
kiwi fruit	1 fruit
orange	1 small, 6½ oz
peach	1 medium, 6 oz
watermelon	1¼ cup
cantaloupe or honeydew melon	1 cup cubed
fruit, canned, unsweetened	½ cup
fruit, dried	¼ cup, 2 tbsp
strawberries, whole	1¼ cup
blueberries, fresh	¾ cup
blackberries, fresh	1 cup
apple, orange or grapefruit juice	½ cup
Milk	
milk, fat-free, low-fat (1%)	1 cup (8 oz)
yogurt, fat-free, low-fat (1%) or reduced-fat (2%), plain or sweetened with sugar-free sweetener	⅔ cup (6 oz)
soy milk	1 cup (8 oz)
whole milk yogurt	1 cup (8 oz)
Fats, Sweets and Alcohol	
brownie, unfrosted	1¼-inch square
cake, unfrosted	2-inch square
cookies	2 small, ⅔ oz
ice cream or frozen yogurt	½ cup
sherbet or sorbet	½ cup
frozen fruit bar	1 bar, 3 oz
pudding, sugar-free	½ cup
syrup, jam, jelly, table sugar, or honey	1 tbsp
light syrup	2 tbsp
Nonstarchy vegetables	
carrots, spinach, cabbage, cauliflower, tomato, cucumber, broccoli, peppers	½ cup cooked, 1 cup raw may be counted as free foods; three servings of free foods at one meal are counted as 1 serving of carbohydrate)

Sample 1-Day Menu

Total Carbohydrate Servings: 15
1,600 to 2,000 calories a day

Breakfast

- 1 small orange (1 carb serving)
- ½ cup shredded wheat cereal (1 carb serving)
- 1 cup fat-free or low-fat milk (1 carb serving)
- 1 slice whole wheat bread (1 carb serving)
- 1 teaspoon trans-fat-free margarine
- 1 boiled egg

Lunch

- Sandwich (2 slices of whole wheat bread with lettuce and tomato slices (2 carb servings))
- 2 ounces of lean meat)
- Carrot and celery sticks (3-4 each)
- 1 cup fat-free or low-fat milk (1 carb serving)
- 1 small apple (1 carb serving)

Snack

- 6 ounces of low-fat fruit yogurt with sugar-free sweetener (1 carb serving)
- 2 tablespoons unsalted nuts

Dinner

- 3 ounces grilled chicken breast
- 2/3 cup pasta (2 carb servings)
- 1 cup tossed salad with 1 tablespoon non-fat dressing
- ½ cup roasted peppers and zucchini
- 1 small whole wheat dinner roll (1 carb serving)
- 1 cup melon balls (1 carb serving)
- Iced tea unsweetened or sweetened with sugar-free sweetener

Snack

- 1¼ cups watermelon (1 carb serving)
- ¾ ounce unsalted mini-pretzels (1 carb serving)

Adapted from the Academy of Nutrition and Dietetics.

Resources

- American Diabetes Association. www.diabetes.org/.
- American Diabetes Association (2003). *Basic Carbohydrate Counting*. Alexandria, VA.
- National Diabetes Education Program. www.ndep.nih.gov.
- National Diabetes Education Program. Tasty Recipes for People with Diabetes and Their Families. <http://ndep.nih.gov/media/tasty-recipes-508.pdf?redirect=true>.
- Warshaw, H. S., and K. Kulkarni (2004). *Complete Guide to Carb Counting*. 2nd ed. American Diabetes Association. Alexandria, VA.

References

- American Diabetes Association. *Complete Guide to Diabetes*. 3rd ed. Alexandria, VA.
- American Diabetes Association. Carbohydrate Counting. Accessed April 21, 2015, at: <http://www.diabetes.org/food-and-fitness/food/what-can-i-eat/understanding-carbohydrates/carbohydrate-counting.html>.
- Buethel, M. (2008). C-O-U-N-T C-A-R-B-S: A 10-step guide to teaching carbohydrate counting. *The Diabetes Educator* 34(1): 67-74.
- Johnson, M. A. (2000). Carbohydrate counting for people with type 2 diabetes. *Diabetes Spectrum* 13(3): 149-154.

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