

STAYING ON TARGET™

TARGET THERAPY

Staying on Target

Carb Counting...Eat to Win!

What is “Carb” Counting?

Carb (carbohydrate) Counting is a meal planning method for people with diabetes. It is a way to count the carb grams or servings in meals and snacks. By evenly spacing carb foods through the day and by eating about the same amount at each meal or snack you get better blood sugar control so you can stay within your blood sugar targets. You can also enjoy a greater variety of meal and snack choices. Carb Counting can be basic or advanced and is a good meal planning system for anyone with diabetes.

Why Should I Count Carbs?

Food contains many nutrients such as carb, protein, fat, vitamins, minerals, and water. Carb, protein and fat supply the calories in foods that give you energy. Years of research show that carb is the nutrient that has the most effect on your blood sugar. In fact, 90 to 100 percent of the carbs you eat appears in your bloodstream as blood sugar within a few hours after you have eaten. Protein and fat have much less effect on your blood sugar. A healthy diet includes a balance of carbs, protein and fat.



What is Carb?

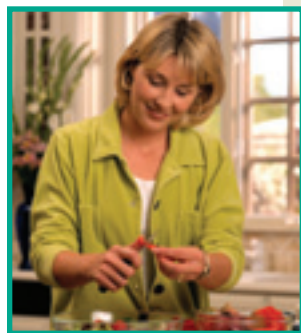
Carb foods are very important to a healthy meal plan. They give us energy as well as vitamins, minerals, and fiber. Foods that provide most of their calories from carbs include fruit, milk, sugar, sweets, breads, cereals, rice, and pasta as well as starchy vegetables such as corn,

peas, potatoes, and dried beans. Carbs break down into sugar and are released into the blood stream.

What Kind of Carb Do I Need?

Many studies have shown that all types of carb foods affect blood sugar in the same way. *It is the amount of carb you eat during a meal or snack that is important, not the type of carb.*¹

For example: If you have one cup of vanilla ice cream that has 30 grams of carbs and a sandwich with 30 grams of carbs, both will affect blood sugar levels in the same way.



Are Some Carbs Better for Me?

To eat as healthily as you can, you should eat the more nutritious high-fiber carbs like whole grains fruits and vegetables including legumes (peas, beans, etc.). Some sweets can be included in your meal plan but should be limited. They often are high in fat and include few nutrients like vitamins, minerals, or fiber. Carb Counting will help you decide how to include sweets in your meal plan. Be aware that “sugar-free” foods may still contain a large amount of carbs.

For example: Sugar-free apple pie will contain carbs from the apples and the crust. Sugar-free ice cream will have carb from milk.

¹ American Diabetes Association Clinical Practice Recommendations 2002, *Evidence-Based Nutrition Principles and Recommendations for the Treatment and Prevention of Diabetes and Related Complications*, Diabetes Care, January 2002, Supplement 1, vol.25, p S50.



Carb-Containing Foods

- Fruit, fruit juices (or any food that contains fruit or fruit juices)
- Milk, ice cream, yogurt (or any food that contains milk)
- Breads, cereals, crackers, grains, pasta, rice
- Starchy vegetables (such as corn, potatoes, peas or beans)
- Non-starchy vegetables (such as broccoli and salad greens that contain very small amounts of carb)
- Sweets (such as cake, candy, cookies, pie)
- Sugary foods (such as regular soda, fruit drinks, sherbet)



How Do I Count Carb?

Carb can be counted by **either carb servings / choices** or by **carb grams**. A gram (g) is a unit of measure used for foods. One carb serving/choice equals 15g of carb. Either method can be used but however you count carb, you will also need to learn and recognize portion sizes.

What is Basic Carb Counting?

With Basic Carb Counting, your carb choices can change from day to day as long as the totals for your meals and snacks are about the same. (You do not have to eat the same foods or meals everyday, but you need to eat the same amount of carb at each meal). Being consistent is the key to Carb Counting. Eating similar amounts of carb foods at each meal or snack helps “even out” the

ups-and-downs in your blood sugar level. You can count the amount of carb you eat as servings, choices or grams.

It is also important to eat balanced meals with lean protein foods along with your carb choices. Basic Carb Counting—along with medication and exercise—helps keep your blood sugar levels in your target range so you can stay as healthy as possible.



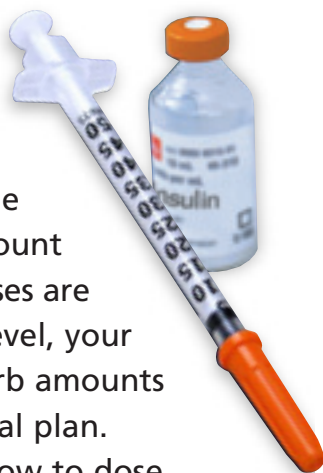
Do I Need Advanced Carb Counting?

If you use flexible insulin therapy you can benefit from Advanced Carb Counting. Flexible management means:

1. Multiple daily insulin injections of before-meal rapid- or short-acting insulin *or*
2. Using an insulin pump *and*
3. Frequent daily self-monitoring of blood sugar

In Advanced Carb Counting, mealtime insulin doses are matched to the amount of carb you choose to eat. Insulin doses are based on your current blood sugar level, your target blood sugar range and the carb amounts in your meal plan.

Learning how to dose your insulin builds on your Basic Carb Counting skills.



Learning The Basics

How Would I Count Carb by the Serving?

You may be familiar with the ADA (American Diabetes Association and American Dietetic Association) *Exchange*

Lists for Meal Planning. These lists group foods according to their nutrients. The carb-containing food groups include Bread/Starch, Fruit, Milk and Other Carbs. The foods in these groups contain about 15 grams of carb per serving. Therefore, one carb choice equals 15 grams of carb.



The following servings are each one carb choice equaling 15 grams of carb, so each of these choices will affect your blood sugar level the same:

- **1/2 cup orange juice from the Fruit Group**
- **3/4 cup of cereal from the Bread/Starch Group**
- **1 cup of milk (12 grams of carb) from the Milk Group.**

Twelve grams of carb is equal to one carb choice.

For example: Whether you drink a 1/2 cup of orange juice (one carb choice) or 3/4 cup of cereal (one carb choice) or one cup of milk (one carb choice) each food choice will affect your blood sugar about the same because each contains equal amounts of carb. All carb-containing foods are counted equally. Learning the serving size of each item in the carb-containing food groups will help you count your carb servings at meals and snacks.

Remember: 15g of carbs = 1 carb serving or carb choice.



Carb Amounts in the *Exchange Lists for Meal Planning*

Food Exchange Group	Carb Grams Per Item	Carb Servings
Starch/Bread	15 g carb	1 carb serving or choice
Fruit	15 g carb	1 carb serving or choice
Milk	12 g carb	1 carb serving or choice
Other Carbs	15 g carb	1 carb serving or choice
Vegetable	5 g carb	1/3 carb serving or choice
Meat/Meat Substitute	0 g carb	0 carb serving or choice
Fat	0 g carb	0 carb serving or choice

You may have an *Exchange List* meal plan from your dietitian that suggests specific amounts of **carb servings** for each meal and snack. Keep in mind that different sized portions of fruit, starch, milk, grains, etc. contain different amounts of carb. What you consider a portion may actually count as more than one carb serving.

For example: one carb serving of pasta is 1/3 cup (15 g carb); if you eat 1 cup of pasta, your portion is actually 3 carb servings (45g carb).

How Would I Count Carb by the Grams?

Another way to count carb is to count the number of **carb grams** in the portions you eat, and add those amounts together for a meal or snack total. A gram (g) is a unit of measure for foods. Your meal plan may suggest specific amounts of carb grams at each meal or snack. You will need to become familiar with your portion sizes and the amounts of carb they contain.

For example: If your portion of pasta is one cup, you are eating 45 g of carb.

There are many resources you can use to find out how much carb is in the food you eat, such as:

- The Internet
- Brand Name Food Books
- Bowes and Church's Food Values of Portions Commonly Used²
- Cookbooks
- Restaurant Item Lists
- The BD Getting Started™ Fast Food Guide

What Supplies Do I Need to Get Started?

Some helpful carb counting tools include:

- "Nutrition Facts" panel on food labels
- Measuring cups for liquids
- Measuring cups for solids
- Measuring spoons
- Food scale
- Calculator



Practice is important. First, measure your usual food portions. Then, compare them to the serving sizes listed on the Nutrition Facts panel on food labels. It is also a good idea to compare your portions with the serving sizes in

the ADA *Exchange Lists for Meal Planning*. Knowing portion sizes will be helpful when you are eating in a restaurant.

² Pennington. Jean A.T., Bowes and Church's Food Values of Portions Commonly Used. Seventeenth Edition, J.B. Lippincott, Philadelphia. 1997.



How Can I Use Nutrition Facts on Food Labels?

The most common tool for preparing foods at home is the Nutrition Facts panel. Nearly everything you buy in grocery stores, except for meats and fresh produce, has a Nutrition Facts panel on the label. Once you know what to look for on the label, you will be able to count carb by the serving or the gram.

To Find the Amount of Carb Servings:

1. **Check the product serving size.**
In this example it is 1 cup.

2. **See the total g (grams) carb amount for the serving size.**
In this example it is 31g. (The sugars are already accounted for in the total carb amount.)

3. **Find the dietary fiber amount for the serving size.** If a food you are planning to eat has five or more grams of fiber per serving, subtract the grams of fiber from the total carb grams in the meal. Fiber is a carb that is not absorbed by the body, so high fiber foods have less of an effect on blood sugar levels.

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			
Trans Fat 3g			
Cholesterol	30mg		
Sodium	470mg		20%
Total Carbohydrate	31g		
Dietary Fiber 0g			
Sugars 5g			
Protein	5g		
Vitamin A			4%
Vitamin C			2%
Calcium			
Iron			
*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

For example: One cup of cooked oatmeal has 25g of carb and six g of dietary fiber. The total available carb is 19g (25g minus 6g) or one carb serving.³

³ Warshaw, Hope S. and Bolderman, Karen M., Practical Carbohydrate Counting: A How to guide for Health Professionals. American Diabetes Association, 2001, p.43

4. Find the number of carb servings or choices by dividing the total g carb by 15. In this example it is 2 (31g divided by 15 equals 2.06, round to 2). One serving of this product is equal to two carb servings or choices.
5. Measure your portion. How does it compare to the serving size on the label? How many carb servings is your portion?

For example: If you eat one cup your portion is two carb servings.

6. Add up the total amount of the other carb foods you are eating. That will give you a total amount of carb servings for that meal or snack.

TO COUNT CARB SERVINGS:

Grams of Carb	Count as the following Carb Servings
0 to 5g	Do not count
6 to 10g	1/2 carb serving or choice
11 to 20g	1 carb serving or choice
21 to 25g	1 1/2 carb servings or choices
26 to 35g	2 carb servings or choices

To Find the Amount of Carb Grams:

1. Find the product serving size. In this example, it is 1 cup.
2. Look at the total carb amount for the serving size. In this example, it is 31g. One cup of this product contains 31g carb. The sugars are already accounted for in the total carb amount, so you do not have to count them.

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

If a food you are planning to eat has 5 or more grams of fiber per serving, subtract the grams of fiber from the total carbohydrate grams in the meal.

- 3. Measure your portion.** How does it compare to the serving size on the label? How many servings is your portion?

- 4. Multiply your number of servings times the grams of carb per serving.**

One serving of this product is one cup and has 31 g of carb. If you are eating 1 1/2 cup, multiply 1 1/2 times 31. This equals 46 1/2 grams of carb (round to 47g). One- and-one-half cups of this product would equal 47 grams of carb.

- 5. Get the total amount of carb for that meal or snack by adding the amounts of the other carb foods you are eating.**



How Much Carb Do I Need?

Everyone needs a different amount of carb. The amount that is best for you depends on your age, height, weight, level of physical activity, current blood sugar level, and your blood sugar targets. Most people start with 3 or 4 carb servings (45 to 60g) at each meal and 1 or 2 carb servings (15 to 30g) for snacks. Your dietitian can help provide the amounts that would be best for you.



Sample Menu

FOOD/BEVERAGE

CARBOHYDRATE GRAMS

BREAKFAST

1/2 cup orange juice	15
2 slices (2 oz.) whole-wheat toast	30
1 soft-cooked egg	0
2 tsp. Margarine	0
12 oz. coffee	0
1 pkg. Sweetener	3

Total grams carbohydrate: 48

LUNCH

2 slices (2 oz.) rye bread	30
2 oz. sliced turkey	0
2 lettuce leaves	<1
1 tsp. mayonnaise	0
1 small bag (3/4 oz.) pretzels	15
1 small (4 oz.) apple	15
12 oz. diet cola soda	0

Total grams carbohydrate: 60

MID-AFTERNOON SNACK

16 oz. diet iced tea	0
1/2 c. frozen yogurt	15

Total grams carbohydrate: 15

SUPPER/DINNER

1 c. tossed salad greens, cucumber slice	5
1 Tbsp. salad dressing	0
3 oz. baked chicken breast	0
1/2 c. mashed potato	15
1/2 c. sliced carrots	5
1 small (1 oz.) dinner roll	15
1 tsp margarine	0
2" brownie square	15
12 oz. diet caffeine-free cola soda	0

Total grams carbohydrate: 50

BEDTIME SNACK

1/2 c. juice-packed fruit cocktail	15
2 small (2/3 oz.) sandwich-type creme filled cookies	15
10 peanuts	0

Total grams carbohydrate: 30



What Should I do About Protein and Fat?

Counting carb servings or grams does not mean you should ignore protein and fat in your diet. Meat and meat substitutes contain protein and fat, which are also essential nutrients. But eating too many servings of protein and fat can lead to weight gain and other health problems, including high cholesterol.

Most active adults should aim for a total of about 6 oz. of cooked meat or meat substitutes per day. Choosing very lean or lean meats over medium- to high-fat meats are healthier options. This can be divided between your meals. A simple way to plan this is to have one small serving at lunch, and one medium-sized serving at supper. A 3 oz. serving is about the size of a deck of cards.

Fats that are considered more “healthy” are liquid at room temperature. Limit the use of fats. Most of your fat intake should be unsaturated fat such as olive, canola, or peanut oils, nuts, seeds, or avocado. Limit your amounts of saturated fats like butter, bacon, cream, solid shortenings, and high-fat meats. Ask your dietitian for help.



Can I Have Alcohol?

Always use caution when drinking alcohol! Pure alcohol, such as gin, rum, vodka, or whiskey and most wines do



not contain carb, but do have calories. Research has shown that drinking alcohol can cause low blood sugar (hypoglycemia).⁴ At first, blood sugar may increase; especially if the drink contains carb (beer, wine or some mixed drinks), but blood sugar could drop several hours after drinking. To prevent low blood sugar, always eat food, especially carb, if you drink alcohol.

It is generally recommended that you limit your alcohol to one or two drinks, one to two times per week. One drink is equal to:

- **12 oz. light beer (regular beer contains about 15 grams of carb)**
- **5 oz. Wine**
- **1.5 oz. glass of pure alcohol (distilled spirits)**

If you drink alcohol, check your blood sugar regularly to watch the effects. You should check your blood sugar before and several hours after a drink to determine the effect of alcohol on your blood sugar. When mixing drinks with carb-containing liquids like orange juice you need to count the carb in the mix.⁵



⁴ American Diabetes Association Clinical Practice Recommendations 2002, *Evidence-Based Nutrition Principles and Recommendations for the Treatment and Prevention of Diabetes and Related Complications*, Diabetes Care, January 2002, Supplement 1, vol.25, p S55.

⁵ Franz, Marion J. and Bantle, John P. Editors. American Diabetes Association Guide to Medical Nutrition Therapy for Diabetes. Clinical Education Series P. 202-204. 1999.

Advanced Carb Counting

Why do I Need to Keep Records?

Once you've learned the basics of carb counting, you're ready for Advanced Carb Counting. It is important to understand how your carb intake, insulin doses, and other factors affect your sugar levels. To do this you will need to keep four different kinds of records for several days or weeks.

1. Food and drink records

- Name of food or drink _____
- Portion size _____
- Carb grams in your portions _____
- Alcohol intake _____

2. Insulin dose records

- Kind of insulin _____
- Time of dose _____
- Amount of dose _____

3. Self-monitoring of blood sugar records

- Fasting blood sugar level _____
- Pre-meal blood sugar level _____
- Two-hour after-the-start-of-the-meal blood sugar level _____
- Bedtime blood sugar level _____

4. Records of other factors that can affect your blood sugar level

- Physical activity _____
- Illness _____
- Stress _____
- Low blood sugar and amount and type of treatment used _____

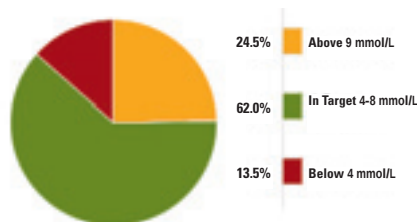
What is Pattern Management?

To identify your blood sugar patterns you will need to look over your records. A pattern is a trend in your blood sugar levels over a length of time. Many blood glucose meters have software that can assist you in seeing these trends in blood sugar. "Pattern management" is changing your diabetes care so you can stay within your blood sugar targets. This could mean adjusting your:

- Meal plan
- Amount of insulin
- Level of physical activity

For example: You may see that your blood sugar levels are above or below your targets at certain times of day or after eating certain foods. Once you notice a trend that needs correction, you can make the necessary changes.

PIE CHART – ALL BLOOD SUGAR READINGS

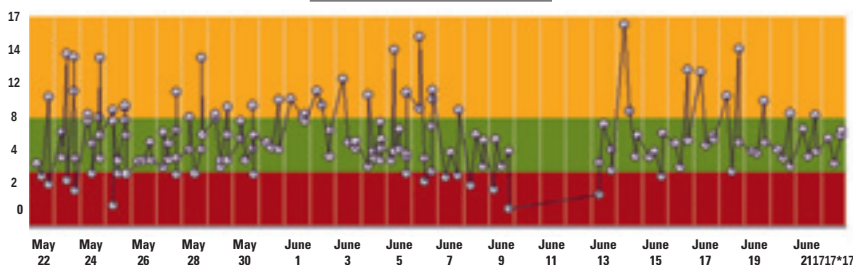


What is An Insulin-to-Carb Ratio?

This is the amount of rapid- or short-acting insulin you need to match, or "cover," the amount of carb you have eaten. Your ratio depends on how sensitive you are to insulin. The more sensitive you are, the more carb you will need. Knowing your ratio and how to dose your mealtime insulin to match your carb intake will give you the most flexibility with improved blood sugar control.

mmol/L

TREND CHART – BLOOD SUGAR

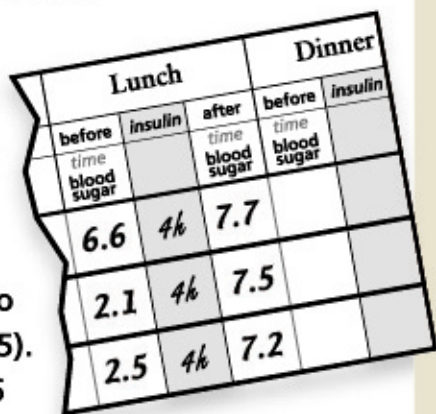


How Can I Find My Ratio?

1. **Review your records.**
2. **Look for patterns.** Pay careful attention to the amounts of carb you ate, your blood sugar readings, and your insulin dosages. Eat as consistent amounts of carb at meals and snacks as possible.
3. **Use your information to calculate your ratio.** If your pre-meal and post-meal blood sugar readings were within your target ranges, divide the grams of carb by your pre-meal rapid-acting insulin dose. The result is your insulin-to-carb ratio.

For example: Here is how one individual determined his ratio:

- He ate 60 g (4 servings) of carb at lunch.
- His before-lunch blood sugar level was within target range.
- His before-lunch rapid-acting insulin dose was 4 units.
- His after-lunch blood sugar level was within target range.
- He divided his grams of carb by his insulin dosage to get his ratio (60 g divided by 4 units equals 15).
- His insulin-to-carb ratio was 1:15 (one unit of insulin covered 15 g or one serving of carb).

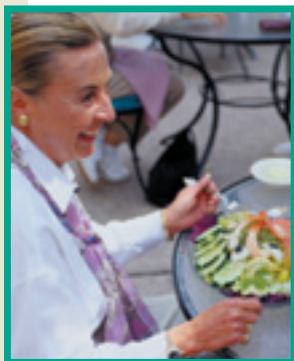


Lunch			Dinner	
before time blood sugar	insulin	after time blood sugar	before time blood sugar	insulin
6.6	4h	7.7		
2.1	4h	7.5		
2.5	4h	7.2		

4. **Do these calculations for several meals over many days.** Keep in mind that your ratio could change by meal, day, or special circumstances, such as active days or inactive days, illness, or stress. Eating new foods or drinking alcohol can also affect your blood sugar levels. In these cases, you may need to change your ratio(s).

5. A good starting point for most adults might be a ratio of 1:10. Children and insulin-sensitive people

generally use a 1:10 or 1:15 insulin-to-carb ratio. Everyone is different and it may take some time to see what works best for you. Your diabetes educator can help you find the insulin-to-carb ratio that is right for you.

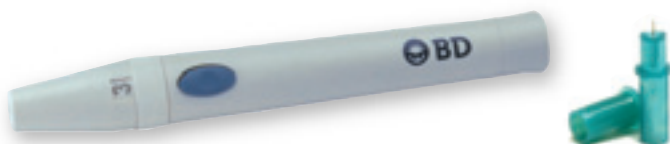


Why is the Insulin Sensitivity Factor (ISF) Important?

Your ISF is the amount of blood sugar (in mmol/L) reduced by one unit of rapid- or short-acting insulin over two to four hours. The ISF helps decide how much insulin you need to get elevated blood sugar back in your before-meal blood sugar target range. Your ISF should be tailored for your needs. Ask your doctor to give you your ISF. Trial-and-error and keeping detailed records will help you find your ISF. Typically, adults use an ISF of about 3 mmol/L, while children and insulin-sensitive adults use an ISF of 1.5 to 3 mmol/L. Everyone is different.

How Can I Figure Out My Correction Dose of Insulin?

Once you know your ISF, you can use it to calculate your **correction dose (supplemental dose)** of insulin. Depending on when you check your blood sugar level, you may be advised by your physician to add your correction dose to your pre-meal insulin dose, or to take your correction dose three or four hours after your meal.



To calculate your correction dose:⁶

1. Subtract your target blood sugar level from your current blood sugar level.
2. Divide by your ISF.
3. The result is your correction dose of insulin.

For example: Here is how one person with diabetes computed her correction dose.



- Her pre-meal blood sugar level was 13.8 mmol/L.
- Her target pre-meal blood sugar level was 5.5 mmol/L.
- She subtracted her pre-meal blood sugar target of 5.5 mmol/L from her

actual pre-meal blood sugar of 13.8 mmol/L

and found she was 8.3 mmol/L over target.

- Her ISF was 3 mmol/L.
- She divided 8.3 by 3 and got 2.76, which she rounded to 3.
- Her correction dose was 3 units

Here is her same computation expressed as an equation:

Dinner			Bedtime	
before	Insulin	after		Insulin
time blood sugar		time blood sugar	time blood sugar	
13.8	6.3%	7.7		

$$\frac{(\text{Current blood glucose} - \text{target blood glucose})}{\text{Insulin Sensitivity Factor}} = \frac{(13.8 - 5.5)}{3} = \frac{8.3}{3} = 2.76, \text{ round to } 3$$

Always check with your physician or healthcare provider for specific guidelines.

⁶ Warshaw, Hope S., Bolderman, Karen M., Practical Carbohydrate Counting. Association, 2001, p.29.



Things to Remember

A healthy diet is a balance of carb, protein, and fat. For most adults, this includes about two to four servings from the milk group each day. Choose fewer salty and high fat foods, and include fiber-containing foods.

There are many ways to learn the carb gram amounts of your favorite foods. Read labels, ask for nutrition information when eating out and check with your dietitian. Carb Counting can be a successful meal planning approach to help manage your diabetes. With time and practice, you will become an expert. The benefits of more flexibility and better blood sugar control will result in a winning effort!



For basic guidelines, each food portion listed contains about 15g of carb and counts as one carb serving, unless noted otherwise.



Carbohydrate Servings

Starch

Breads, Cereals and Grains, Starchy Vegetables, Crackers and Snacks, Beans, Peas, and Lentils, and Starches Prepared with Fat

One serving = 15 g carbohydrate or 1 carbohydrate serving

FOOD

SERVING SIZE

BREAD

Bagel, 4 oz	1/4 (1oz)
Bread, white, whole-wheat, pumpernickel, rye, unfrosted raisin	1 slice (1oz)
English muffin	1/2
Hot dog or hamburger bun	1/2 (1oz)
Muffin, 5 oz	1/5 (1oz)
Pancake, 4 in. across, 1/4 in. thick	1
Pita, 6 in. across	1/2
Roll, plain, small	1 (1oz)
Tortilla, corn or flour, 6 in. across	1
Tortilla, flour, 10 in. across	1/3
Waffle, reduced-fat, 4 in. square or across	1

CEREALS AND GRAINS

Bran cereals	1/2 cup
Cereals, cooked	1/2 cup
Cereals, unsweetened, ready-to-eat	3/4 cup
Granola, low-fat	1/4 cup
Grits	1/2 cup
Oats	1/2 cup
Pasta	1/3 cup
Puffed cereal	1 1/2 cups
Rice, white or brown	1/3 cup
Sugar-frosted cereal	1/2 cup

STARCHY VEGETABLES

Baked beans	1/3 cup
Corn	1/2 cup
Corn on cob, large	1/2 cob (5 oz)
Mixed vegetables with corn, peas,	1 cup
Peas, green	1/2 cup
Potato, boiled	1/2 cup or 1/2 medium (3 oz)
Potato, baked with skin	1/4 large (3 oz)
Potato, mashed	1/2 cup
Squash, winter (acorn, butternut, pumpkin)	1 cup
Yam, sweet potato, plain	1/2 cup

CRACKERS AND SNACKS

Graham crackers, 2 1/2 in. square	3
Popcorn (popped, no fat added or low-fat microwave)	3 cups
Pretzels	3/4 oz
Rice cakes, 4 in. across	2
Saltine-type crackers	6
Snack chips, fat-free (tortilla, potato)	15–20 (3/4 oz)
Whole-wheat crackers, no fat added	2–5 (3/4 oz)

BEANS, PEAS, AND LENTILS

(also contain about 7 g protein per serving and 5-7g fiber)

Beans and peas (garbanzo, pinto, kidney, white, split, black-eyed), lentils	1/2 cup
Lima beans	2/3 cup

STARCHY FOODS PREPARED WITH FAT (about 5g fat per serving)

Biscuit, 2 1/2 in. across	1
Chow mein noodles	1/2 cup
Corn bread, 2 in. cube	1 (2 oz)
Croutons	1 cup
Granola	1/4 cup
Popcorn, microwave	3 cups
Sandwich crackers, cheese or peanut butter filling	3
Snack chips (potato, tortilla)	9–13 (3/4 oz)
Stuffing, bread (prepared)	1/3 cup
Taco shell, 6 in. across	2
Waffle, 4 in. square or across	1

Fruit and Fruit Juices

One serving = 15 g carbohydrate or 1 carbohydrate serving

FOOD

SERVING SIZE

FRUIT

Fresh fruit, 1 small	.1 (4oz)
Canned fruit, unsweetened	.1/2 cup
Dried fruit, unsweetened	.1/4 cup
Blackberries, blueberries	3/4 cup
Cantaloupe, small	.1/3 melon (11 oz) or 1-cup cubes
Cherries, sweet, fresh	.12 (3oz)
Dates	3
Grapefruit, large	.1/2 (11oz)
Grapes, small	.17 (3oz)
Honeydew melon	.1 slice (10oz) or 1 cup cubes
Pineapple, fresh	3/4 cup
Plums, small	2 (5oz)
Raisins	2 Tbsp
Raspberries	.1 cup
Strawberries	.1 1/4 cup whole berries
Tangerines, small	2 (8oz)
Watermelon	.1 slice (13 1/2 oz) or 1 1/4 cup cubes

FRUIT JUICE

Apple juice/cider, grapefruit juice, orange juice, pineapple juice	.1/2 cup
Cranberry juice cocktail, 100% fruit juice blends, grape juice, prune juice	.1/3 cup
Cranberry juice cocktail, reduced-calorie	.1 cup



Milk

One serving = 12–15 g carbohydrate or 1 carbohydrate serving

FOOD	SERVING SIZE
Fat-free, 1/2%, 1%, 2%, whole, sweet acidophilus	1 cup
Buttermilk, low-fat or fat-free	1 cup
Chocolate, reduced fat or whole	1/2 cup
Dry, fat-free	1/3 cup dry
Evaporated, fat-free or whole	1/2 cup
Soymilk, fat-free, low-fat, reduced fat	1 cup
Yogurt, plain or sweetened w/nonnutritive sweetener . . .	1 cup
Yogurt, plain low-fat or made from whole milk	1 cup
Yogurt, flavored and sweetened with fructose	3/4 cup

Non-starchy Vegetables

One serving = 5 g carbohydrate

One serving is free. Three servings = one carbohydrate serving or choice (15 grams of carbohydrate).

One serving of a non-starchy vegetable is:

1 cup raw:

1/2 cup cooked:

Artichoke	Green onions	Salad greens
Artichoke hearts	or scallions	(endive, escarole,
Asparagus	Greens (collard,	lettuce, romaine,
Beans (green,	kale, mustard,	spinach)
wax, Italian)	turnip)	Sauerkraut
Bean sprouts	Kohlrabi	Spinach
Beets	Leeks	Summer squash
Broccoli	Mixed vegetables	Tomato
Brussels sprouts	(w/o corn, peas,	Tomatoes, canned
Cabbage	pasta)	Tomato sauce
Carrots	Mushrooms	Tomato/vegetable
Cauliflower	Okra	juice
Celery	Onions	Turnips
Cucumber	Pea pods	Water chestnuts
Eggplant	Peppers (all varieties)	Turnips
	Radishes	

Sweets and Desserts

1 carbohydrate serving = 15 g carbohydrate

2 carbohydrate servings = 30 g carbohydrate

3 carbohydrate servings = 45 g carbohydrate

These foods are listed according to how many carbohydrate and fat servings they contain.

FOOD	SERVING SIZE	SERVINGS
Angel food cake, unfrosted	1/12th cake (about 2oz)	2 carbs
Brownie, small, unfrosted	2in. square (about 1oz)	1 carb, 1 fat
Cake, unfrosted	2in. square (about 1oz)	1 carb, 1 fat
Cake, frosted	2in. square (about 2oz)	2 carbs, 1 fat
Cookie or sandwich cookie		
with creme filling	2 small (about 2/3 oz)	1 carb, 1 fat
Cookies, sugar-free	3 small or 1 large (3/4–1oz)	1 carb, 1–2 fats
Cupcake, frosted	1 small (about 2oz)	2 carbs, 1 fat
Doughnut, plain cake	1 medium (1 1/2 oz)	1 1/2 carbs, 2 fats
Doughnut, glazed	3 3/4 in. across (2oz)	2 carbs, 2 fats
Fruit juice bars, frozen,		
100% juice	1 bar (3oz)	1 carb
Fruit spreads, 100% fruit	1 1/2 Tbsp	1 carb
Gelatin, regular	1/2 cup	1 carb
Granola or snack bar,		
regular or low-fat	1 bar (1oz)	1 1/2 carbs
Honey	1 Tbsp	1 carb
Ice cream	1/2 cup	1 carb, 2 fats
Ice cream, light	1/2 cup	1 carb, 1 fat
Ice cream, low-fat	1/2 cup	1 1/2 carbs
Ice cream, fat-free,		
no sugar added	1/2 cup	1 carb
Jam or jelly, regular	1 Tbsp	1 carb
Pie, fruit, 2 crusts	1/6 pie	3 carbs, 2 fats
Pie, pumpkin or custard	1/8 pie	2 carbs, 2 fats
Pudding, regular (made		
with reduced-fat milk)	1/2 cup	2 carbs
Pudding, sugar-free or		
sugar-free and fat-free	1/2 cup	1 carb
(made with fat-free milk)		

FOOD	SERVING SIZE	SERVINGS
Sherbet, sorbet	1/2 cup	2 carbs
Sports drinks	.8oz.	1 carb
Sugar	1 Tbsp	1 carb
Sweet roll or Danish	1 (2 1/2oz)	2 1/2 carbs, 2 fats
Syrup, light	2 Tbsp	1 carb
Syrup, regular	1 Tbsp	1 carb
Yogurt, frozen	1/2 cup	1 carb, 0–1 fat
Yogurt, frozen, fat-free	1/3 cup	1 carb
Yogurt, low fat with fruit	1 cup	3 carbs, 0–1 fat

Meat and Meat Substitutes

Most adults should plan to have a total of 4-6 oz. per day.

Each of these servings = 1 oz. meat.

1 oz. cooked chicken, turkey, fish, lean beef, pork,
lamb, wild game

1 slice cheese

1/4 cup cottage cheese or tuna

1/2 cup tofu

1 Tbsp peanut butter

1 egg

Fat

Try to limit your fat intake to 3 to 5 servings per day. One serving = 5 g fat.

One fat serving is:

1 tsp margarine, butter, mayonnaise, oil

1 Tbsp cream cheese, salad dressing, and half-n-half cream,
reduced-fat margarine or reduced fat mayonnaise

1 Tbsp sesame, pumpkin, or sunflower seeds

2 Tbsp sour cream, reduced-fat cream cheese, reduced-fat
salad dressing

Combination Foods

These foods have servings from several food groups:

FOOD	SERVING SIZE	SERVINGS
Spaghetti or pasta sauce, canned	...1/2 cup	...1 carb, 1 fat

ENTREES

Tuna noodle casserole, lasagna, spaghetti with meatballs, chili with beans, macaroni and cheese	...1 cup (8oz)	...2 carbs, 2 meats
Chow mein (without noodles or rice)	...2 cups (16oz)	...1 carb, 2 meats

FROZEN ENTREES AND MEALS

Dinner-type meal	...generally 14–17 oz	...3 carbs, 3 meats, 3 fats
Pizza, cheese, thin crust	...1/4 of 10 in. (5 oz)	...2 carbs, 2 meats, 1 fat
Pizza, meat topping, thin crust	...1/4 of 10 in. (5 oz)	...2 carbs, 2 meats, 2 fats
Pot pie	...1 (7 oz)	...2 1/2 carbs, 1 meat, 3 fats
Entree or meal with less than 340 calories	...about 8–11 oz	...2–3 carbs, 1–2 meats

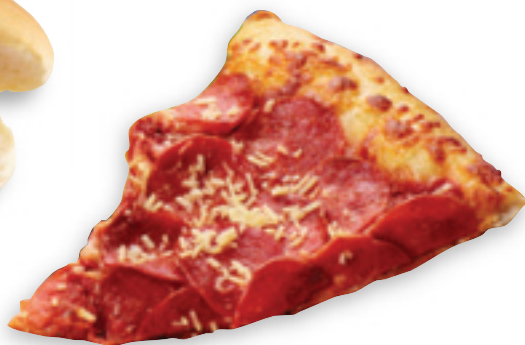
SOUPS

Bean	...1 cup	...1 carb, 1 meat
Cream (made with water)	...1 cup (8 oz)	...1 carb, 1 fat
Instant	...6 oz prepared	...1 carb
Instant with beans/lentils	...8 oz prepared	...2 1/2 carbs, 1 meat
Split pea (made with water)	...1/2 cup (4 oz)	...1 carb
Tomato (made with water)	...1 cup (8 oz)	...1 carb
Vegetable beef, chicken noodle, or other broth-type	...1 cup (8 oz)	...1 carb



FAST FOODS

FOOD	SERVING SIZE	SERVINGS
Burrito with beef	.1 (5–7 oz)	3 carbs, 1 meat, 1 fat
Chicken nuggets	.6	1 carb, 2 meats, 1 fat
Chicken breast and wing, breaded and fried	.1 each	1 carb, 4 meats, 2 fats
Chicken sandwich, grilled	.1	2 carbs, 3 meats
Chicken wings, hot	.6 (5oz)	1 carb, 3 meats, 4 fats
Fish sandwich/tartar sauce	.1	3 carbs, 1 meat, 3 fats
French-fries	.1 medium serving (5oz)	4 carbs, 4 fats
Hamburger, regular	.1	2 carbs, 2 meats
Hamburger, large	.1	2 carbs, 3 meats, 1 fat
Hot dog with bun	.1	1 carb, 1 meat, 1 fat
Pizza, individual pan	.1	5 carbs, 3 meats, 3 fats
Pizza, cheese, thin crust	1/4 medium (12" round) about 6 oz	2 1/2 carbs, 2 meats
Pizza, meat, thin crust	1/4 medium (12" round) about 6 oz	2 1/2 carbs 2 meats, 1 fat
Soft-serve cone	.1 small (5oz)	2 1/2 carbs, 1 fat
Submarine sandwich	.1 sub (6 in.)	1 vegetable, 2 meats, 1 fat, 3 carbs
Taco, hard or soft-shell	.1 (3-3 1/2 oz)	1 carb, 1 meat, 1 fat



Free Foods

These foods contain less than 5 g of carbohydrate and have less than 20 calories per serving. If a serving size is given, limit the food to three servings per day.

FAT-FREE OR REDUCED-FAT FOODS

FOOD	SERVING SIZE
Cream cheese, fat-free	1 Tbsp (1/2oz)
Creamers, nondairy, liquid	1 Tbsp
Creamers, nondairy, powdered	2 tsp
Mayonnaise, fat-free	1 Tbsp
Mayonnaise, reduced-fat	1 tsp
Margarine spread, fat-free	4 Tbsp
Margarine spread, reduced-fat	1 tsp
Nonstick cooking spray	
Salad dressing, fat-free or low fat	1 Tbsp
Salad dressing, fat-free, Italian	2 Tbsp
Sour cream, fat-free, reduced-fat	1 Tbsp
Whipped topping, regular	1 Tbsp
Whipped topping, light or fat-free	2 Tbsp

SUGAR-FREE FOODS

Candy, hard, sugar-free	1 candy
Gelatin dessert, sugar-free	
Gelatin, unflavored	
Gum, sugar-free	
Jam or jelly, light	2 tsp
Sugar substitutes, alternatives, or replacements*	
Syrup, sugar-free	2 Tbsp

*FDA (Food and Drug Administration) approved include:

Equal® (aspartame)	Sweet-10® (saccharin)
Splenda® (sucralose)	Sugar Twin® (saccharin)
Sprinkle Sweet® (saccharin)	Sweet 'n Low® (saccharin)
Sweet One® (acesulfame K)	

DRINKS

Bouillon, broth, consommé	
Bouillon or broth, low-sodium	
Carbonated or mineral water	
Club soda	
Cocoa powder, unsweetened	1 Tbsp
Coffee	
Diet soft drinks, sugar-free	
Drink mixes, sugar-free	
Tea	
Tonic water, sugar-free	

CONDIMENTS

Catsup	1 Tbsp
Horseradish	
Lemon juice	
Lime juice	
Mustard	
Pickles, dill	1 1/2 large
Salsa	1/4 cup
Soy sauce, regular or light	1 Tbsp
Taco sauce	1 Tbsp
Vinegar	
Yogurt	2 Tbsp

SEASONINGS

Flavoring extracts	
Garlic	
Herbs, fresh or dried	
Pimento	
Spices	
Tabasco® or hot pepper sauce	
Wine, used in cooking	
Worcestershire sauce	



Food Diary

NAME _____ DATE _____

MEAL PLAN GOAL_____

NUMBER OF CARB CHOICES:

Breakfast_____ carb choices

Lunch _____ carb choices

Dinner_____carb choices

Snacks_____carb choices

Record all the food that you eat for at least 3 days below. This record will help you and your health care team decide if changes in medication and or your meal plan should be made.

TIME	AMOUNT	SNACK/MEAL	FOOD EATEN / PREPARATION	CARB CHOICES
GOAL:				
EXERCISE:				