

PAVING YOUR PATH TO DIABETES MANAGEMENT:

Basic Carbohydrate Counting and The Glycemic Index



What is carbohydrate?

Carbohydrate is one of the three main nutrients found in foods. Starches, fruit, milk products, sugar, and some vegetables have carbohydrates. Your body needs carbohydrate for energy. It breaks them down into a sugar called glucose. Your brain and body need glucose to work properly.

Carbohydrates and Diabetes

With diabetes, it is important to eat the right types and amounts of carbohydrate. Some carbohydrates make your blood glucose go high quickly. Others raise your blood glucose slowly and to a smaller degree.

Choosing the Right Types of Carbohydrates

The Glycemic Index (GI) groups carbohydrate foods by how they affect your blood glucose levels. Using the Glycemic Index, you can make better food choices.



Choose **LOW** and **MEDIUM** GI foods more often

LOW GI* Choose most often	MEDIUM GI* Choose more often	HIGH GI* Choose less often
<p>Breads:</p> <ul style="list-style-type: none"> • 100% stone ground whole wheat • heavy mixed grain • pumpernickel <p>Cereal:</p> <ul style="list-style-type: none"> • All Bran™ • Bran Buds with Psyllium™ • Oat Bran™ <p>Grains:</p> <ul style="list-style-type: none"> • barley • bulgar • pasta/noodles • parboiled or converted rice <p>Other:</p> <ul style="list-style-type: none"> • green plantain, peeled, boiled** • breadfruit, peeled, boiled, 10 minutes** • sweet potato • yam • legumes • lentils • chickpeas • kidney beans • split peas • soy beans • baked beans 	<p>Breads:</p> <ul style="list-style-type: none"> • roti (60 g)** • whole wheat • rye • pita <p>Cereal:</p> <ul style="list-style-type: none"> • Grapenuts™ • puffed wheat • oatmeal • quick oats <p>Grains:</p> <ul style="list-style-type: none"> • basmati rice • brown rice • couscous <p>Other:</p> <ul style="list-style-type: none"> • plantain, riped, peeled, boiled ** • breadfruit, raw** • potato, new/white • sweet corn • popcorn • Stoned Wheat Thins™ • Ryvita™ (rye crisps) • black bean soup • green pea soup 	<p>Breads:</p> <ul style="list-style-type: none"> • white bread • kaiser roll • bagel, white <p>Cereal:</p> <ul style="list-style-type: none"> • bran flakes • corn flakes • Rice Krispies™ <p>Grains:</p> <ul style="list-style-type: none"> • short-grain rice <p>Other:</p> <ul style="list-style-type: none"> • cassava, peeled and boiled** • potato, baking (Russet) • french fries • pretzels • rice cakes • soda crackers

* Adapted with permission from: Foster-Powell K, Holt SHA, Brand-Miller JC. International table of Glycemic Index and Glycemic Load Values AM J Clin Nutr. 2001;76:5-76

**Information obtained from the Glycemic Index Foundation. The University of Sydney. www.glycemicindex.com (Note – there are no Canadian references to the Glycemic Index values to the information with **)

How Much Carbohydrates Do You Need?

The amount of carbohydrate you need depends on your age and weight. It also depends on how active you are. Speak to the registered dietitian on your health care team to see what amount is right for you.

General Guidelines for women and men:

	Women	Men
In a meal	3 to 4 carbohydrate choices	4 to 5 carbohydrate choices
In a snack	1 to 2 carbohydrate choices	1 to 2 carbohydrate choices

Making food choices

In this chart, each food choice contains about 15 grams of carbohydrate. That is what we call 'one carbohydrate choice'. In the chart, we show in brackets how to measure the portion, using either:

- cup measure
- milliliters (mL)
- tablespoons (tbsp) or
- grams (g)



Grains and starches

- | | | |
|---|--|--|
| <ul style="list-style-type: none">• plantain, cooked (½ cup, 125 mL)• breadfruit, raw (⅓ cup, 75 mL)• cassava (¼ cup, 50 mL)• bread, 1 slice• bagel ½ - 3 inch diameter (29 g)• bagel ¼ - 4 ½ inch diameter (29 g)• roti (1 piece, 44 g)• tortilla (10 inch, 25 cm)• pita bread, (½, 6 inch, 15 cm) | <ul style="list-style-type: none">• rice, brown and white, long-grain, cooked (⅓ cup, 75 mL)• pasta, barley or buckwheat, cooked (½ cup, 125 mL)• cold cereal (½ cup, 125 mL)• oatmeal, cooked (¾ cup, 175 mL)• cream of wheat, cooked (¾ cup, 175 mL) | <ul style="list-style-type: none">• potato, mashed (1/2 cup, 125 mL)• potato, boiled, baked (1/2 medium, 84 g)• yam (½ cup, 125 mL)• sweet potato (⅓ cup, 75 mL)• corn (maize), kernel (½ cup, 125 mL)• corn, cob (½ ear, 73 g)• cooked beans, lentils, split peas (½ cup, 125 mL) |
|---|--|--|

Fruit

- | | | |
|--|---|--|
| <ul style="list-style-type: none">• mango, ½ medium (104 g) or ½ cup (83 g)• guava, 3 (165 g)• jackfruit (½ cup, 125 mL)• breadfruit (¼ cup, 55 g)• orange, apple or pear (1 medium)• peach (1 large) | <ul style="list-style-type: none">• banana (1 small or ½ large)• canned fruit in light syrup (½ cup, 125 mL)• coconut, raw, (3 cups)• coconut, sweetened (½ cup, 125 mL)• grapes (½ cup or 15 pieces) | <ul style="list-style-type: none">• blueberries or melons (1 cup, 250 mL)• banana chips (1 oz, 28 g)• raisins (2 tbsp, 18 g)• fruit juice (½ cup, 125 mL) |
|--|---|--|

Vegetables

- | | | |
|--|---|--|
| <ul style="list-style-type: none">• canned peas (½ cup, 125 mL)• fresh or frozen peas (¾ cup, 175 mL)• squash or pumpkin (1 cup, 250 mL) | <ul style="list-style-type: none">• tomatoes, canned, regular (2 cups, 500 mL)• tomatoes, canned, stewed (1 cup, 250 mL) | <ul style="list-style-type: none">• Most other vegetables are very low in carbohydrate and high in nutrients and dietary fibre |
|--|---|--|

Milk and alternatives

- | | | |
|--|--|--|
| <ul style="list-style-type: none">• skim milk powder (2 tbsp, 30 mL)• evaporated milk, canned (½ cup, 125 mL) | <ul style="list-style-type: none">• milk or buttermilk (1 cup, 250 mL)• plain or low-fat yogurt – ¾ cup, 175 mL (for yogurt with fruit, read the Nutrition Facts Table) | <ul style="list-style-type: none">• plain fortified soy beverage (1 cup, 250 mL) |
|--|--|--|

Other choices

- | | | |
|--|--|---|
| <ul style="list-style-type: none">• sugar, syrup, jam, molasses or honey, (1 tbsp, 15 mL)• regular soft drink (½ cup, 125 mL) | <ul style="list-style-type: none">• 1 plain muffin (45 g)• cream filled cookies, 2• arrowroot cookies, 4 | <ul style="list-style-type: none">• popcorn, air popped or low fat (3 cups, 750 mL)• granola bar, oatmeal type, 1 (28 g) |
|--|--|---|

Foods and beverages with very little carbohydrate

- | | | |
|---|--|--|
| <ul style="list-style-type: none">• coffee, black• tea, black• diet soft drinks | <ul style="list-style-type: none">• herbs• spices• vinegar | <ul style="list-style-type: none">• mustard• other condiments |
|---|--|--|

Format adapted from: *Carbohydrate Counting*, Vancouver Coastal Health (2010).
Information taken from *Beyond the Basics: Meal Planning for Healthy Eating, Diabetes Prevention and Management* (2005).

For an extensive list of foods containing carbohydrates: www.diabetes.ca/for-professionals/resources/nutrition/beyond-basics/#hints

Planning your menu

You can plan your own menu using the Glycemic Index and carbohydrate choices. Here are some sample menus to help get you started.

Looking for recipe ideas? Visit diabetesgps.ca.

Sample Menu #1 Breakfast

Food item	Number of carbohydrate choices	Grams of carbohydrates <i>(rounded to the nearest 15)</i>
porridge – plantain, cooked ($\frac{2}{3}$ cup)	2	30
boiled egg, 1	0	0
papaya, 1 small, or 1 cup cubed	1	15
Total	3	45 g

Sample Menu #2 Lunch

Food item	Number of carbohydrate choices	Grams of carbohydrates <i>(rounded to the nearest 15)</i>
yam, cooked (1 cup, 250 mL)	2	30
kale, cooked	0	0
baked chicken, cooked (2 oz, 60g)	0	0
mango, $\frac{1}{2}$ medium	1	15
low-fat milk or fortified soy beverage (1 cup, 250 mL)	1	15
1 hot tea or coffee, black	0	0
Total	4	60 g

Sample Menu #3 Dinner

Food item	Number of carbohydrate choices	Grams of carbohydrates (rounded to the nearest 15)
brown rice and peas ($\frac{2}{3}$ cup, 150 mL)	2	30
mixed vegetables	0	0
salmon croquette	0	0
oil (1 tsp, 5 mL)	0	0
guava, 3 fruits	1	15
1 hot tea or coffee, black	0	0
Total	3	45 g

From *Beyond the Basics: Meal Planning for Healthy Eating, Diabetes Prevention and Management* (2005).

Easy Ways to Plan the Size of Meals and Snacks

Use the Plate Method and Handy Portion Guide to help you with planning your meals and snacks.

Fruit



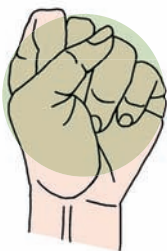
Vegetables at least 2 kinds



Milk

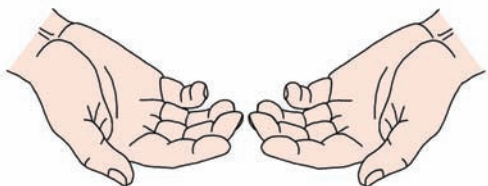
Grains and starches potato, pasta, rice, roti, plantain

Meat and alternatives fish, lean meat, chicken, beans, lentils



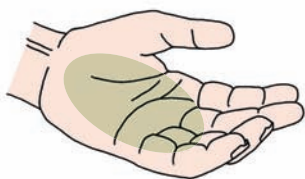
Grains and starches/fruit

Choose an amount the size of your fist for fruit, grains and starches.



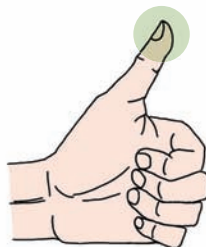
Vegetables

Choose as much as you can hold in both hands.



Meat and alternatives

Choose an amount the size of the palm of your hand and the thickness of your little finger.



Fat

Limit fat to an amount the size of the tip of your thumb.

Milk and alternatives

Drink 250 mL (8 oz) of low-fat milk or have $\frac{3}{4}$ cup (175 mL) of yogurt with a meal.

Finding Carbohydrate Values Using The *Nutrition Facts* Table?

On packaged foods, you can find out how much carbohydrate is in a serving by reading the *Nutrition Facts* table. Here is an example, showing you what to look for:

Look at the **SERVING SIZE**

Compare this to the amount that you eat.

Look at the **CARBOHYDRATE** in the listed serving

Fibre and sugar are included in this number.

Subtract the **FIBRE** from **Carbohydrate**

Fibre is not digested and does not raise your blood glucose.

In this example:

36g – 6g (fibre) = **30 g** of available carbohydrate.

Nutrition Facts	
Per 90 g serving (2 slices)	
Amount	% Daily Value
Calories 170	
Fat 2.7 g	4 %
Saturated 0.5 g + Trans 0 g	5 %
Cholesterol 0 mg	
Sodium 200 mg	8 %
Carbohydrate 36 g	13 %
Fibre 6 g	24 %
Sugars 3 g	
Protein 8 g	
Vitamin A 1 %	Vitamin C 0 %
Calcium 2 %	Iron 16 %

What Should My Blood Glucose be Before and After Meals?

Before meals	4 to 7 mmol/L
2 hours after meals	5 to 10 mmol/L

If your blood glucose goes up only 2 to 3 mmol/L two hours after your meal, you are doing well. If your blood glucose is going too high after meals, ask yourself:

- Are my meals balanced?
- Did I include some protein and fat?
- Am I eating too many carbohydrates?



611018



Diabetes GPS is a tool developed by the Canadian Diabetes Association

diabetes.ca | 1-800-BANTING (226-8464)