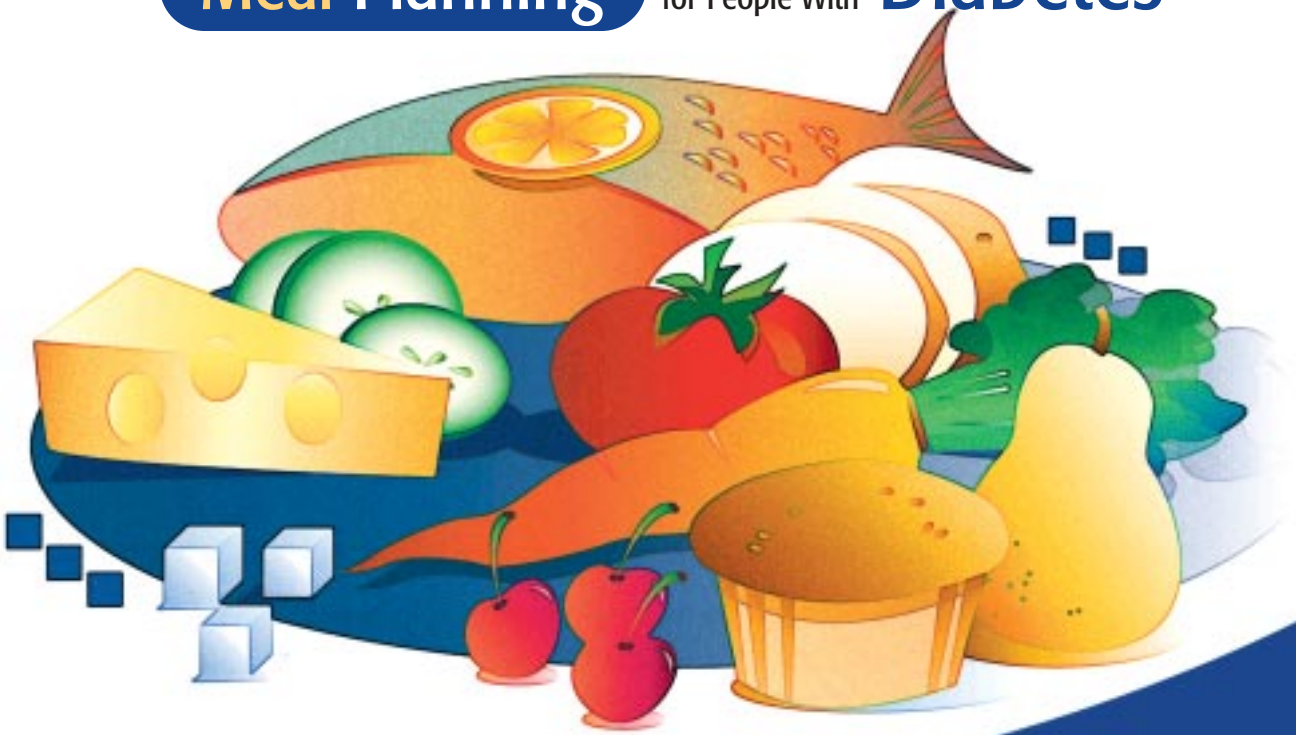
Meal Planning for People With Diabetes



Québec

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Diabetes Québec's mission is to inform, promote awareness, educate, provide services, foster research, and act as an advocate for the rights of people with diabetes.

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Meal Planning for People with Diabetes

Diabetes Québec

Santé et Services sociaux Québec

Authors' Note

A balanced diet is the cornerstone to treating diabetes. This guide is intended to help dietitians and people with diabetes create a personalized food plan and make it a part of daily life. Effectively controlling blood sugar and lipid levels, achieving and maintaining optimum weight, and adopting a healthy, delicious diet are the primary objectives of this meal plan.

We wish to thank the following dietitians for their contribution and support in producing this guide:

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What is the Exchange System?

The exchange system is the basis of your meal plan.

It includes seven food groups: starches, fruits, vegetables, milk, sugar-added foods, meat and meat alternatives, and fats and oils.

Within each group, foods are ranked according to their carbohydrate (sugar), protein, and fat content. Foods in the same group, when eaten in the amounts indicated, represent **one exchange** for this group. For example, one vegetable exchange is equal to 125 mL of vegetable juice or one small carrot (see p. 29).

To use the exchange system,

1) Ask your dietitian to complete your **DAILY MEAL PLAN** and create a **SAMPLE MENU**

2) Familiarize yourself with the different food groups and the amounts indicated in your meal plan

3) Use your meal plan at mealtime to choose the right number of exchanges from each food group

Foods in the same group can be exchanged in the amounts indicated. **Sometimes**, you can also exchange foods from two different groups, for example, by eating a starch instead of a fruit. However, you must pay attention to the carbohydrate content of the substituted food because it is important that **your total carbohydrate intake stay the same**. To help you, the average carbohydrate content is given for each food group, as is the number of sugar cubes.

Sugar Cubes

The sugar cube concept helps us visualize the carbohydrate content of each food group so you can easily identify the foods with the most carbohydrate and, therefore, the greatest effect on your blood sugar (glycemia). Each sugar cube represents 5 grams of carbohydrate (or 1 teaspoon or 1 packet of sugar).

 = 5 g carbohydrate

Keep In Mind

If the **DAILY MEAL PLAN** page in your guide has not been completed by a dietitian, you are missing the key to effectively controlling your condition or promoting proper weight loss. Only a qualified dietitian can create a food plan based on

- Your special nutritional needs, according to your age, height, bone structure, gender, and degree of physical activity
- Your tastes and eating habits
- Your medication (oral tablets and insulin)
- Diabetes-related conditions, such as hypertension (high blood pressure), heart problems, and dyslipidemia (change in blood lipid levels, including cholesterol and triglycerides)

Reading Labels

The exchange system gives you a list of the most common foods in each group. Less common foods are not listed however you can eat these foods **provided you know their carbohydrate content** as this will determine how they can fit into your meal plan.

To find out the amount of carbohydrate and other nutrients in a specific store-bought food, refer to the **nutrition facts** printed on the product packaging. You must use the **total carbohydrate content**, as shown in the example below. Since dietary fiber has no effect on blood sugar level (glycemia) and is included in the total carbohydrate shown on the product packaging, it must be subtracted from the total carbohydrate if the food contains **5 g of fiber or more per portion**. This is the case for certain high fiber grain products and most legumes.

Example: white bread - Nutrition Facts - Serving Size 1 slice (37.5 g)

AMOUNT PER SERVING	
Calories	96
Total Fat	1 g
Saturated Fat	0.2 g
Trans Fat	0 g
Cholesterol	0 mg
Sodium	136 mg
Total Carbohydrate	**16 g**
Dietary Fiber	1 g
Sugars	1 g
Protein	**3 g**
Vitamin A	0 %
Vitamin C	0 %
Calcium	2 %
Iron	0 %

Total amount of carbohydrate, including starch, sugars, and fiber

Includes added sugars **and** other sugars found naturally in foods

This slice of white bread contains 16 g of carbohydrate. Since 1 starch exchange contains 15 g of carbohydrate (see pages 14 to 21), 1 slice of white bread is therefore equivalent to 1 starch exchange or 3 sugar cubes.

1 slice white bread = 16 g carbohydrate = 1 starch exchange
16 g ÷ 5 g (carbohydrate content of 1 sugar cube) = approximately 3 sugar cubes
=

General Recommendations

By following your meal plan, you will have a balanced diet and thus maximize your ability to effectively control your blood sugar.

Here are some recommendations to help you achieve your objectives:

1) Eat foods in the amounts recommended in your **DAILY MEAL PLAN**

2) Eat all scheduled meals and snacks

3) Do not take away some carbohydrate-containing foods at one meal in order to have more at another meal as this will have a direct impact on your blood glucose levels. For example, avoid eating an extra slice of bread for breakfast and leaving one out at lunch

4) As much as possible, try and eat your meals (and snacks, if any) at the same time every day

5) Choose a variety of foods within the same group (for example, eat different types of fruits and vegetables)

6) Contact your dietitian if your exercise program, medication, health, weight, or appetite changes significantly. Do not hesitate to consult your dietitian with any questions about your diet.

Food Group	TOTAL for the Day
Starches	
Fruits	
Vegetables	
Milk	
Meat and Meat Alternatives	
Fats and Oils	
Sugar-Added Foods	
Total Carbohydrate	_____ g
Total Sugar Cubes	

Daily Meal Plan

Number of Exchanges

Breakfast Time:	Morning Snack Time:	Lunch Time:	Afternoon Snack Time:	Dinner Time:	Evening Snack Time:
_____ g	_____ g	_____ g	_____ g	_____ g	_____ g

Sample Menu

Meal or Snack	Food		Exchange
Breakfast			Starches
			Fruits
			Milk
			Meat and Meat Alternatives
			Fats and Oils
			Sugar-Added Foods
Morning Snack			
Lunch			Starches
			Vegetables
			Meat and Meat Alternatives
			Fruits
			Milk
			Fats and Oils
			Sugar-Added Foods
Afternoon Snack			

Sample Menu (continued)

Meal or Snack	Food		Exchange
Dinner			Starches
			Vegetables
			Meat and Meat Alternatives
			Fruits
			Milk
			Fats and Oils
			Sugar-Added Foods
Evening Snack			

Food Groups and Exchanges

On the following pages, you will find a **food list** for each of the seven food groups. Each portion indicated represents 1 exchange for that food group (e.g., 125 mL pasta = 1 starch exchange; see p. 20). Pay **special attention** to **portion size**. To begin, we recommend measuring your food. Gradually, you'll develop the ability to estimate portion size on sight. Then, you'll only have to weigh your food occasionally to make sure your eyes aren't playing tricks on you!

Food volume and **weight** are indicated in milliliters (mL) and grams (g). To find the **equivalent** in teaspoons, cups, or ounces, refer to the **table** on **page 62**.

The table below summarizes the nutritional value of 1 exchange from each food group.

	Nutritional Value of 1 Exchange			
Food Group	Carbohydrate (g)	Protein (g)	Fat (g)	Calories
Starches	15	2	0	70
Fruits	15	0	0	60
Vegetables	5	2	0	25
Milk	12 to 15	8	0 to 9	90 to 160
Sugar-Added Foods	15	Variable	Variable	Variable
Meat and Meat Alternatives	0	8	3	60
Fats and Oils	0	0	5	45

*Note: Foods with an **asterisk (*)** are high in salt and should thus be eaten in moderation, especially if you have been advised to stay away from the saltshaker. However, some of these foods are now available in low-salt versions, such as V-8® with no salt added and salt-free peanut butter.*

Food Groups and Exchanges

Starches

Whole grain breads and cereals are recommended because they are **high in fiber**, which promotes proper intestinal function. You should also choose whole grain cereals with little or no sugar added because of their higher nutritional value.

1 starch exchange = 15 g carbohydrate
2 g protein
0 g fat
70 Calories

Sugar cubes:

Each serving in the list below represents 1 starch exchange or 

Crackers and snaks

Grissol® bread sticks	4
Melba toast	4
Popcorn, plain	750 mL
Rice cakes - Plain, cheddar - Apples and cinnamon	 2 approximately 20 g cakes one 14 g cake
Ryvita®, Wasa® crackers	2
Salted pretzels*	30 sticks or 6 twists
Soda crackers	7
Swedish toast	2
For these choices, also calculate 1 fats and oils exchange: Breton®*, Champagne®* crackers	 6
Cheese* or Peanut Butter* Ritz® crackers	4
Ritz®* crackers	8

Cookies

Almond biscotti, graham, Midget Snaps®	3
Arrowroot, Social Tea, Petit Beurre	4
Goglu®, Village®	2

Breakfast cereals containing at least 2 g of fiber per serving

100% Bran (Post®)	150 mL
All Bran (Kellogg's®)	125 mL
All Bran Buds with psyllium (Kellogg's®)	75 mL
Bran Flakes (Kellogg's®)	125 mL
Corn Bran (Quaker®)	150 mL
Oat Bran cold cereal (Quaker®)	125 mL
Oat Bran hot cereal (Quaker®)	
- Uncooked	75 mL
- Cooked	175 mL
Oatmeal, plain	
- Uncooked	60 mL
- Cooked	175 mL
Puffed Wheat (Quaker®)	500 mL

Shredded Wheat (Nabisco®)	1 biscuit
Shreddies (Post®)	125 mL
Spoon Size Shredded Wheat 'N Bran (Post®)	125 mL
Weetabix	1 biscuit

Other breakfast cereals

Cheerios (General Mills®)	
- Plain	175 mL
- Multigrain	150 mL
Corn Flakes (Kellogg's®)	150 mL
Cream of Wheat (Nabisco®)	
- Uncooked	30 mL
- Cooked	125 mL
Crispix (Kellogg's®)	125 mL
Rice Krispies (Kellogg's®)	150 mL
Special K (Kellogg's®)	175 mL
- Special K Red Berries	150 mL
Wheat germ	60 mL

Flour

Wheat, all purpose	40 mL

Starch

Corn	30 mL

Vegetables

Corn	
- On the cob	one 10 cm cob
- Creamed	75 mL
- Kernel	125 mL
Mixed vegetables (with corn or peas)	125 mL
Parsnip	125 mL
Peas	150 mL
Plantain	1/4 or 75 mL
Potato	
- Boiled or baked	1 small
- Mashed	125 mL
Sweet potato	
- Baked	1/2 medium
- Mashed	60 mL
Yam	75 mL, cubed

For this choice, also calculate 1 fats and oils exchange:	
French fries	10
For this choice, also calculate 2 fats and oils exchanges:	
Chips*	15

Legumes

For this choice, also calculate 1 meat and meat alternative exchange:	
Beans (black, mung, pinto, red, white), chickpeas, lentils, split peas	125 mL cooked
For this choice, also calculate 1 meat and meat substitute exchange + 2 fats and oils exchanges:	
Hummus	90 mL

Breads

Bagel, English muffin, hot dog or hamburger bun, pita bread	1/2
Bread crumbs	45 mL
Bread, light (e.g., Weight Watchers®)	1 1/2 slices
Bread: white, whole wheat, multigrain, rye, raisin	1 slice
Croutons, plain	150 mL
French bread (baguette)	1 piece 5 cm long (30 g)

Salad roll (30 g)	1
Tortilla, corn or wheat (18 cm in diameter)	1
For these choices, also calculate 1 fats and oils exchange:	
Croissant (30 g)	1/2 medium
Taco (shell 13 cm in diameter)	2

Pasta and other cooked grains

Barley, couscous, millet, and rice	75 mL cooked
Bulgur	150 mL cooked
Pasta (macaroni, spaghetti, etc.)	125 mL cooked
For this choice, also calculate 1 fats and oils exchange:	
Chinese noodles	125 mL cooked

Soups

Cream of tomato, canned, prepared with an equal amount of water*	150 mL
Cream soup, dry, prepared with water* (asparagus, cauliflower, leek)	375 mL
Pea soup, skimmed of fat*	175 mL
Soup with noodles, rice, or any another starch, skimmed of fat*	375 mL
For this choice, also calculate 2 fats and oils exchanges:	
Cream of celery, canned, prepared with an equal amount of water*	400 mL

For this choice, also calculate 3 fats and oils exchanges:	
Cream of mushroom, canned, prepared with an equal amount of water*	500 mL

Flour-based products

Crepe (10 cm in diameter)	1/2
Pizza crust (30 cm in diameter, 2 cm thick)	1/12 (35 g)
For these choices, also calculate 1 fats and oils exchange:	
Buckwheat pancake (10 cm in diameter)	2
Muffin, homemade, plain or bran (6 cm in diameter)	1
Waffle (10 cm in diameter)	1
For these choices, also calculate 2 fats and oils exchanges:	
Donut, plain, unglazed (8 cm in diameter)	1
Pie crust (23 cm in diameter)	
- Double (top and bottom)	1/8 pie (40 g)
- Single (top or bottom only)	1/4 pie (40 g)

Fruits

Like vegetables, fruits are high in **vitamins and minerals**. Choose **brightly colored** fruits (e.g., oranges, strawberries) most often, as they are high in **antioxidants** (beta carotene, Vitamins C and E) and can help prevent heart disease and certain cancers.

Choose fresh fruit, frozen fruit with no sugar added, or canned fruit in unsweetened fruit juice, water, or light syrup. The servings indicated for canned fruit include a small amount of juice or light syrup (approximately 30 mL). If fruit is in a heavy syrup, rinse it with water.

1 fruit exchange = 15 g carbohydrate
0 g protein
0 g fat
60 Calories

Sugar cubes:

Each serving in the list below represents 1 fruit exchange or 

Fruit

Apricot	
- Fresh	4
- Canned	4 halves
- Dried	8 halves
Banana	1/2 medium/12 cm
Blueberries	175 mL
Cantaloupe	1/3 melon/250 mL
Cherries	15
Clementine	2 to 3
Cranberries, fresh	300 mL
Currants	250 mL
Dates, dried	2

Figs	
- Fresh	1 large or 2 small
- Dried	1
Fruit compote with no sugar added	125 mL
Pineapple	
- Fresh	2 slices
- Canned	125 mL
Raspberries	250 mL
Starfruit	1 1/2
Strawberries	
- Fresh	20 medium/300 mL
- Frozen	175 mL
Apple	
- Fresh	1 small
- Sauce, unsweetened	125 mL
Blackberries	175 mL
Fruit salad, canned	125 mL
Grapefruit, pink or white	1/2
Grapes, fresh	15 large/125 mL
Honeydew melon	1/8 melon/250 mL

Kiwi	2 small
Lychee	10
Mango	1/2 medium/125 mL
Nectarine, orange	1
Papaya	1/2
Peach	
- Fresh	1 large/175 mL
- Canned	2 halves/125 mL
Pear	
- Fresh	1 small
- Canned	2 halves/125 mL
Persimmon	2
Plum	
- Fresh	2 medium
- Canned	4
Prunes	3 medium
Raisins	30 mL
Rhubarb	500 mL

Tangerine, mandarin orange	
- Fresh	1 large
- Canned	125 mL
Watermelon	1/2 slice/300 mL

100% pure fruit juice, no sugar added

Cranberry blend, 100% pure	100 mL
Peach and pear nectar	75 mL
Pineapple, orange, grapefruit, apple, or a blend of these juices	125 mL
Prune, grape juice	75 mL

Even with no sugar added, 100% pure **fruit juices** contain rapidly absorbed carbohydrates. For this reason, you should **drink them in moderation**. The best choice is fresh fruit, since it contains dietary fiber. Here are a few tips for drinking less fruit juice:

- Use a smaller glass in order to decrease the amount of juice you drink
- Dilute juice with water or soda water (being careful to choose waters with less than 1 mmol or 23 mg of sodium per liter)
- Drink juice with meals in order to reduce its effect on your blood sugar

Fruit drinks and fruit-flavored crystals are not 100% pure fruit juice. They are high in added sugar and low in vitamins and minerals. For this reason, they are listed in the **sugar-added** food group.

Vegetables

Vegetables are high in **vitamins** and **minerals**, as well as **dietary fiber**. It is recommended that you eat at least 2 to 3 servings a day, preferably **brightly colored** vegetables (e.g., broccoli, peppers, carrots).

Vegetables are generally low in carbohydrate and have little effect on blood sugar.

Vegetables high in carbohydrate–starchy vegetables–are listed in the starch group.

Other vegetables are listed below by serving size. Each serving of these vegetables in the amount indicated contains approximately **5 g of carbohydrate**, or 1 sugar cube.

Calculate the carbohydrate in these vegetables only if

- You eat a large amount–three or more servings. **Be careful with the vegetables in the 75 mL column**–they are sweeter, so it's easy to eat more than the indicated amount!
- You must **calculate** the amount of carbohydrate you eat **very accurately** (i.e., if your treatment includes a number of insulin injections)

When preparing vegetables, opt for cooking methods that preserve nutritional value, such as steaming, cooking in a microwave or conventional oven, or boiling in a small amount of water. Eat them raw-they're wonderfully crisp and tasty with a lowfat dip!

1 vegetable exchange =	5	g carbohydrate
	2	g protein
	0	g fat
	25	Calories

Sugar cube: 

Each serving in the lists below represents 1 vegetable exchange or 

75 mL	
Beet	1 small
Carrot	1 small or 7 baby
Onion	1/2 medium
Tomato sauce, canned*	
Turnip or yellow rutabaga	
Sliced Water chestnuts	6 whole
Winter squash, cubed (butternut, acorn, spaghetti, hubbard, buttercup, etc.)	

125 mL	
Artichoke hearts	
Artichoke leaves	1/2 medium
Brussels sprouts	5
Celery root	
Leek	1/3 medium
Pepper	1/2 medium
Pumpkin, cooked, pureed	
Snow peas	
Tomato, fresh	1 medium
Tomato juice*	
Tomatoes, canned	
Vegetable juice*	
Vegetable soup	

250 mL	
Asparagus	8 spears
Bean sprouts	
Beans, yellow wax or green	
Beet greens, cooked	
Broccoli (6 stalks)	
Cabbage, green or red	
Cauliflower	5 stalks
Celery	5 stalks
Chard, cooked	
Eggplant	
Fiddleheads	
Mushrooms, cooked	
Turnip or white rutabaga	
Zucchini	1 small

500 mL or more
Alfalfa sprouts
Bamboo shoots
Chard, raw
Chinese cabbage (bok choy)
Cucumber
Dandelion greens
Endives
Green onion
Lettuce
Mushrooms, raw
Radish sprouts
Radishes
Spinach

Milk

Milk and other dairy products are an excellent source of **calcium**. Eating them is key to maintaining healthy bones and teeth and may help reduce high blood pressure.

1 milk exchange =	12 to 15	g carbohydrate
	8	g protein
	0 to 9	g fat
	90 to 160	Calories

Sugar cubes:

The fat and Calorie content of foods in this group varies according to product type. To reduce your fat intake, choose **skim milk or partly skimmed milk** and **yogurt with 2% fat or less**.

Milk, 250 mL	Fat (Grams)	Calories
Whole, 3.25% fat	9	160
Partly skimmed, 2% fat	5	130
Partly skimmed, 1% fat	3	110
Skim	0	90

Each serving in the list below represents 1 milk exchange or 

Kefir, plain	375 mL
Milk, concentrated, unsweetened (Carnation®)	125 mL
Milk drink, calcium-enriched	250 mL
Milk, powdered	45 mL
Milk: skim, 1%, 2%, or whole	250 mL
Soy drink, enriched, non-flavored	250 mL
Yogurt, plain	175 mL (175 g)

Fresh cheese	
- Minigo®, Petit Danone®	one 60 g container
Kefir with fruit	125 mL
Yogurt, drinkable	
- Petit Danone®	one 93 mL container
- Yop®	one-half 200 mL container
Yogurt, fruit or flavored, fat-free, no sugar added	
- Astro®	one 125 g container
- Silhouette®	one 113 g container
Yogurt in a tube	
- Minigo Tubes®, Danone X-Press®	two 40 g containers
- Yoplait®	one 60 g container
For this choice, also calculate 1 fruit exchange:	
Yogurt, fruit, or vanilla or coffee flavored	175 mL (175 g)

Cheese is listed in the **meat and meat alternatives** group because it contains very little carbohydrate.

Sugar-added foods

Sugar-added foods can sometimes **replace starch, fruit, or milk** in your meal plan. Some also contain one or more **fats and oils exchanges**. These foods are generally low in vitamins, minerals, and fiber but **high in Calories**.

1 sugar-added food exchange = 15 g carbohydrate
Varying amount of protein, fat, and Calories

Sugar cubes:

Here are some specific recommendations concerning these foods:

- Eat sugar-added foods **with meals**, when insulin is generally the most active. Avoid eating them as a snack or in too large an amount, as this could cause hyperglycemia (an excessive level of sugar in the blood).
- At meals, sugar-added foods should generally **replace** other carbohydrate-containing foods which means **they should be substituted, not added to the meal**, because your total carbohydrate intake at the meal must stay the same. If the carbohydrate content of the sugar-added food is added to the carbohydrate content of your regular meal, your diabetes medication may need to be adjusted to offset this additional carbohydrate.
- Eating sugar-added foods regularly may cause weight gain. Eat them **occasionally**, **in moderation**, and as part of a balanced diet.

The following list contains foods commonly found at the supermarket. Keep in mind, however, that the **nutrition facts printed on product packaging** are the most accurate source of information on carbohydrate content.

Homemade baked goods (muffins, cakes, etc.) often contain less sugar and fat than store-bought varieties. They can also be prepared with healthier fat choices. Ask your dietitian about how to reduce the fat and sugar content in your favorite recipes. You can also buy a diabetic cookbook.

Each serving in the list below represents 1 sugar-added food exchange or 

Cookies

Molasses (8 cm in diameter)	1
Vanilla wafers	3
For this choice, also calculate 1 fats and oils exchange: Cookies, chocolate chip or chocolate sandwich	2

Beverages

Chocolate drink powder	1/2 packet/15 mL
Chocolate milk	125 mL
Clam and tomato juice* (Clamato®)	125 mL
Cranberry cocktail	75 mL
Fruit drink or punch	125 mL
Hot chocolate (store-bought, prepared with water)	125 mL
Iced tea mix, sweetened	15 mL
Malt mix for plain or chocolate drink (Ovaltine®)	30 mL
Milkshake, vanilla or chocolate	75 mL

Soft drink, regular (e.g., Coca-Cola®)	125 mL
Thirst quencher (e.g., Gatorade®)	250 mL

Condiments

Sweet pickles	
- Beets	4 slices
- Gherkins	3
- Roasted peppers	1/3
Sweet sauces (cherry, cranberry, sweet and sour)	30 mL

Desserts, dessert fillings, snacks

Candied fruit	20 mL (20 g)
Flavored ice (e.g., Popsicle®)	one 75 mL bar
Frozen fruit juice bar (Tropicana®)	1 1/2 52 mL bars
Frozen fruit juice bar, no sugar added (Tropicana®)	three 52 mL bars
Frozen yogurt, little or no sugar added	125 mL
Fruit rollups	1 strip
Gelatin, flavored (Jell-O®)	125 mL
Ice milk, vanilla frozen yogurt	75 mL
Jell-O® pudding, fat-free (sold as powder, reconstituted)	125 mL

For these choices, also calculate 1 fats and oils exchange:	
Cake frosting	15 mL
Flan	125 mL
Ice cream (vanilla, strawberry, chocolate)	125 mL

Candy

Chewing gum, sweetened	3 sticks
Hard candy (6 g)	3
Jujubes	4
Maple sugar	one 2.5 cm cube/15 g
Maple taffy	15 mL
Marshmallows	2
Milk chocolate	1/2 bar/30 g
Soft candy	2 pieces

Spreads, syrups, and sugars

Caramel spread	15 mL
Honey	15 mL

Jam, jelly, marmalade	
- With sugar	15 mL
- Without sugar or ultralight	45 mL
Maple syrup	15 mL
Molasses	15 mL
Sugar, white or brown	3 packets/15 mL
Syrup (corn, table, maple)	15 mL
Syrup, table, no sugar added (E.D. Smith®)	45 mL

Each serving in the list below represents 2 sugar-added food exchanges or 

Beverages

Carnation® Instant Breakfast, powder	1 packet (38 g)

Breakfast cereals, sweetened

Mini-Wheats (Kellogg's®)	175 mL
Oatmeal, instant, flavored	1 packet
Raisin Bran (Kellogg's®)	150 mL
For this choice, also calculate 2 fats and oils exchanges:	
Harvest Crunch (Quaker®)	125 mL

Desserts, snacks

Apple crisp	75 mL
Angelfood cake (20 cm in diameter)	1/12
Blancmange	125 mL
Cereal bar (Nutri-Grain®, Nutri-Fruit®, Full Fruit®)	1 bar (40 g)
Cranberries, dried, sweetened	75 mL
Pudding, lowfat (Healthy Choice®, Magic Moments®)	1 container (90 g)
Rice pudding	125 mL
Sherbet	125 mL
For these choices, also calculate 1 fats and oils exchange:	
Muffin bar	1 bar (38 g)
Muffin, store-bought (6 cm in diameter, 6 cm tall)	1 small (60 g)
Oatmeal cookies, with or without raisins	3
Pudding (vanilla, chocolate)	125 mL
Tapioca	125 mL

For this choice, also calculate 3 fats and oils exchanges:	
Donut, yeast, jelly-filled	1
For this choice, also calculate 4 fats and oils exchanges:	
Donut, chocolate glazed	1

Each serving in the list below represents 4 sugar-added food exchanges or

Desserts: pies and cakes

For this choice, also calculate 2 fats and oils exchanges:	
Lemon pie (23 cm in diameter)	1/6
For this choice, also calculate 3 fats and oils exchanges:	
Chocolate cake, no frosting (23 cm in diameter)	1/10 (115 g)
For these choices, also calculate 4 fats and oils exchanges:	
Fruit pie (23 cm in diameter)	1/6
Pecan pie (23 cm in diameter)	1/6

Meat and Meat Alternatives

Meat and meat alternatives are the primary source of **protein** in our diet. They also provide a certain amount of **fat**, depending on the food. It is recommended that you

- Choose **lean** or **very lean meat and meat alternatives** as often as possible
- Eat **fish at least twice a week** in order to reduce the risk of heart disease. Choose fish high in **omega-3 fatty acids**, such as salmon, trout, albacore or bluefin tuna, halibut, sardines, and mackerel
- Choose **legumes**, an excellent source of fiber that can help control sugar and cholesterol levels

1 meat and meat alternatives exchange =	0 g carbohydrate 8 g protein 0 to 3 g fat 60 Calories

Sugar cube: 0

How can I cook meat leaner?

- Choose lean cuts of meat with no marbling
- Remove visible fat after cooking
- Use cooking methods without added fat: boiling, braising, grilling, baking, or steaming
- Use frying pans with a non-stick surface or grooves to allow cooking with little or no fat. If the recipe calls for fats or oils, use a vegetable oil and avoid overheating
- Skim the fat off cooked meats and stews

Each serving in the list below represents 1 lean or very lean meat or meat alternatives exchange: (3 g fat or less per portion)

Meat, poultry, and organ meats cooked without fat

Back bacon*	30 g
Beef, very lean or lean (boneless strip loin, club steak, cross rib, filet, flank, ribeye, round, sirloin)	30 g
Chicken	30 g
Deli meats: smoked eye of round*, smoked ham*, smoked turkey breast*	30 g
Ham, lean*	30 g
Horse meat	30 g
Lamb	30 g
Moose, venison	30 g
Pork (boneless inside round, center-cut loin, filet)	30 g
Rabbit	30 g
Turkey (skinless, dark or white meat)	30 g
Veal and lean ground veal	30 g

Organ meats cooked without fat (caution: high in cholesterol)

Beef heart, liver, calf sweetbreads, kidneys, chicken liver	30 g

Fish and seafood

Fresh or frozen, cooked without fat:	
Assorted fish (salmon, rainbow trout, sole)	30 g
Clams	3 large
Lobster	60 mL
Mussels	10 small
Oysters	5 medium
Scallops	2 large
Shrimp	6 large or 10 medium
Snails	50 g
Snow crab	75 mL
Canned in water, drained*:	
Crab*	75 mL
Sardines in oil, with bones*	2
Tuna*, salmon*	60 mL (30 g)

Cheese

Cottage (2% fat or less)	75 mL
Processed cheese,* sliced: Lactancia® light, Kraft® fat-free	2 slices
Quark	60 mL (60 g)

Legumes

Tofu weiner	1
For this choice, also calculate 1 starch exchange:	
Black beans, lentils, red beans, split peas	125 mL cooked

Each serving in the list below represents 1 medium fat meat or meat alternative exchange: (5 g fat per portion)

Cheese	
Mozzarella, part skim (approximately 15% fat)	60 mL (30 g)
Parmesan, grated	45 mL
Cretons, lean (homemade)	75 mL
Egg	1 large
Ground beef, lean or extra lean, cooked without fat	30 g
Organ meats cooked without fat	
Beef and pork tongue	30 g
Calf liver (caution: high in cholesterol)	30 g
Tofu	
Firm	50 g
Regular or soft	100 g

Each serving in the list below represents 1 high fat meat or meat alternative exchange: (8 g fat per portion)

Organ meats cooked without fat	
Beef or veal brain (caution: high in cholesterol)	75 g
Cheese	
Cheese,* 20% fat or higher (e.g., brie, cheddar, Swiss)	30 g
Feta*, ricotta	75 mL
Processed cheese*, sliced (cheddar, mozzarella, Swiss)	2 slices
Processed cheese spread, regular or light*	60 mL (60 g)
Cretons, regular*	75 mL

Each serving in the list below represents 1 very high fat meat or meat alternative exchange : (13 to 15 g fat per portion)

Deli meats*	
Blood pudding*	60 g
Bologna*	2 slices/60 g
Pork sausage, fresh*	1 large/75 g
Processed meat (mock chicken)*	2 slices/60 g
Salami*	3 slices/60 g
Smoked sausage (beef, turkey, chicken, pork)*	2/75 g
Peanut butter*	30 mL
For this choice, also calculate 1 starch exchange:	
Hummus	90 mL

Fats and Oils

Fats and oils provide **vitamins (A, D, E, and K)** and **essential fatty acids**. But when eaten in **excess**, they can lead to **weight gain** and **increased blood cholesterol levels**. For this reason, it is best to eat them in **the amount recommended in your daily food plan**.

1 fats and oils exchange =	0	g carbohydrate
	0	g protein
	5	g fat
	45	Calories

Sugar cube: 0

Diabetes is a significant risk factor for cardiovascular disease. To prevent heart problems from developing, keep these rules in mind:

- Avoid "bad" fats, including **saturated and trans fats, as well as cholesterol**. These fats are found primarily in foods of **animal origin** and in store-bought foods that are fried or contain **hydrogenated** fats (e.g., shortening).
- Try and choose **monounsaturated** fats. **Polyunsaturated** fats are also recommended, but in smaller amounts.
- Increase your omega-3 fatty acid intake by adding more canola oil, ground flaxseed, flaxseed oil, and nut oil to your diet.
- Remember that **moderation** is key!

To help you make wise choices, the various fat and oil sources are listed according to the main type of fat they contain.

Each serving in the list below represents 1 fats and oils exchange:

Monounsaturated fat sources

Avocado	1/6
Margarine, reduced Calorie*	10 mL
Margarine, soft*, non-hydrogenated	5 mL

Nuts and seeds - Almonds, peanuts, cashews, hazelnuts, pecans, pistachios	15 mL
Oil: canola, olive, nut, peanut	5 mL
Olives, green or black, marinated*	5 medium or 10 small
Salad dressing, regular, store-bought* or homemade: canola, olive, nut, or peanut oil based - Reduced Calorie	 10 mL 30 mL

Polyunsaturated fat sources

Mayonnaise (caution: contains cholesterol) - Light	5 mL 15 mL
Mayonnaise-based salad dressing (Miracle Whip®) - Light	10 mL 15 mL
Nuts and seeds Pumpkin seeds, sunflower seeds, sesame seeds, walnuts, Brazil nuts	15 mL
Oil: safflower, flaxseed, corn, walnut, sesame, soybean, sunflower	5 mL
Salad dressing, regular, store-bought* or homemade: polyunsaturated oil base - Reduced Calorie	 10 mL 30 mL

Saturated fat, trans fat, and cholesterol sources

Bacon, well done*	2 small strips
Butter	5 mL
Coconut, dried, unsweetened	15 mL
Coconut, fresh, shredded	30 mL
Cream	
- 10% fat	45 mL
- 15% fat	30 mL
- 35% fat	
Liquid	15 mL
Whipped	30 mL
Cream cheese	15 mL
Cream cheese, light	30 mL
Lard, vegetable fat, shortening	5 mL
Liver pâté*	15 mL
Margarine, hydrogenated	5 mL
Oil: coconut or palm kernel	5 mL

Processed cheese spread* (e.g., Cheez Whiz®)	15 mL
Sour cream (14% fat)	30 mL
Whipped topping (Cool-Whip®, Nutri-Whip®)	60 mL

Low Calorie foods

Low Calorie foods have little or no effect on the level of sugar or lipid in your blood because they contain **less than 5 g of carbohydrate per serving** and little protein or fat. They can be eaten freely or, in certain cases, in the amount indicated. Some of these foods are **high in salt**, so use them in moderation! As for all the other food groups, variety is best. **Remember that some vegetables are also low in carbohydrate and high in fiber and vitamins (see p. 27)!**

People whose treatment includes a number of daily insulin injections should check with their dietitian regarding the guidelines for this group.

1 low Calorie food exchange =	< 5	g carbohydrate
	0	g protein
	0	g fat
	< 16	Calories

Sugar cube: 0

Seasonings

Basil	
Cinnamon	
Celery powder	
Curry	
Essences	
Garlic, celery, onion salt*	
Garlic, garlic powder	
Hot peppers	
Lemon	
Lemon, lime juice	
Lime	1 small
Mint	
Onion powder	
Oregano	
Paprika	
Pepper	
Salad dressing, Italian, low fat*	
Salt*	
Shallot	
Soy sauce*	15 mL
Spices* (some blends may be high in salt)	
Vinegar	
Worcestershire sauce*	15 mL

Beverages

Broth, clear, skimmed*	
Carob powder	5 mL
Cocoa powder, unsweetened	15 mL
Coffee, tea, and tisane, plain	
Coffee creamer (powder or liquid)	15 mL
Consommés*	
Crystal Light®	
Diet soft drink	
Hot chocolate from mix, light	1 packet/13 g
Iced tea, lemon, light	250 mL
Mineral water, low sodium (Montclair® without sodium, Perrier®)	
Soda water, plain	

Condiments

Chili sauce	15 mL
Dill pickles*	
Horseradish	
Ketchup*	15 mL
Mustard powder*	
Mustard, prepared*	
Relish*	10 mL
Steak* or barbecue* sauce	15 mL

Reduced fat and nonfat foods

Cream cheese, fat free or ultralight	45 mL
Nonstick cooking spray	
Salsa	45 mL
Sour cream, light: 5%, 1%, or fat free	30 mL
Taco sauce	45 mL

Foods with little or no sugar

Chewing gum, sugarfree	
Gelatin, flavored, no sugar added (sugarfree Jell-O®)	250 mL
Gelatin, plain	
Hard candy, sugarfree	1 piece
Ice cream cone, sugarfree, waffle type	1 cone
Sugar substitutes, noncaloric (see next page)	

Sugar Substitutes

Various sugar substitutes are available on the market. These substitutes fall into two categories: **noncaloric** and **caloric**.

Noncaloric sugar substitutes

A number of noncaloric sugar substitutes are approved by Health Canada. An acceptable daily intake (ADI) is recommended for each one, according to body weight. If you use these substitutes or eat foods containing them in **moderation**, you generally will not exceed the recommended intake for an adult. Pregnant or nursing women should avoid eating saccharine and cyclamates.

Noncaloric Sugar Substitutes Approved by Health Canada

Acesulfame K

Aspartame (Equal®, Nutrasuc®)

Cyclamates (Sugar Twin®, Sucaryl®)

Saccharine (Sweet and Low®, Hermesetas®)

Sucralose (Splenda®)

Caloric sugar substitutes

Some sugar substitutes contain Calories and can influence the level of sugar in your blood. These products should be used **in moderation**, as part of a balanced diet.

- **Fructose** is a sugar (or carbohydrate) that causes less of an increase in blood glucose level than white sugar. There is no proof that using it as a sugar substitute can help control diabetes. Overusing it can result in diarrhea and an increased cholesterol level in some people with diabetes.
- **Sugar alcohols (isomalt, lactitol, maltitol, mannitol, sorbitol, xylitol)** are sugars that are indigestible or partially absorbed by the intestine. Thus, they have little effect on your blood glucose level and contain fewer Calories than white sugar. However, when overused, sugar alcohols can lead to flatulence, diarrhea, and other intestinal discomforts. Note that they may be used as a sugar substitute in foods that are high in fat and Calories (e.g., chocolate with no sugar added).

Alcohol

Drinking alcohol can lower your blood sugar level and cause hypoglycemia, especially when you drink on an empty stomach and use insulin or oral sulfonylurea medications (e.g., Amaryl®, Diabeta®, Diamicron®) or meglitinides (e.g., GlucoNorm®, Starlix®). Alcohol can also increase your blood sugar level and, when consumed regularly or in excess, interfere with weight control, as well as blood sugar and triglyceride levels. Alcohol may also affect other medical conditions. For these reasons, you should discuss your alcohol intake with your doctor.

Rules to follow if you drink alcohol:

- Always drink **with meals**
- Drink in small quantities–**1 to 2 drinks** per day.
  One drink equals
  - 125 mL dry wine
  - 60 mL fortified (or sweetened) wine
  - 340 mL beer
  - 45 mL hard liquor
- Check your **blood sugar level** more often within 24 hours of drinking
- Remember to eat your **snacks**, especially in the evening
- Wear **identification** indicating that you have diabetes
- Keep a **source of sugar** on hand, in case of hypoglycemia

Converting Milliliters to Cups and Ounces to Grams

TABLE OF EQUIVALENTS

International System	Imperial System
Volume	
5 mL (milliliters)	1 teaspoon
15 mL	1 tablespoon
30 mL	2 tablespoons
45 mL	3 tablespoons
60 mL	1/4 cup
75 mL	1/3 cup
125 mL	1/2 cup
150 mL	2/3 cup
175 mL	3/4 cup
250 mL	1 cup
Weight	
30 g (grams)	1 ounce
454 g	1 pound
Energy	
4.2 kJ (kilojoules)	1 Calorie
Length	
2.5 cm (centimeters)	1 inch

Carbohydrate: Term used for all types of sugars (starch, sucrose, fructose, glucose, lactose, etc.).

Dietary cholesterol: A variety of fat found in foods of animal origin.

Dietary fiber: Plant material that is not digested by the body and is eliminated in the stool. Fiber can slow sugar absorption and help reduce blood cholesterol.

Glycemia: Level of glucose (or sugar) in the blood.

HDL cholesterol (HDL-C): Often called "good cholesterol," it is produced by the body and acts as a carrier in the blood. A high level of HDL cholesterol can help reduce the risk of cardiovascular disease by carrying fats from the blood to the liver.

LDL cholesterol (LDL-C): Often called "bad cholesterol," it is produced by the body and acts as a carrier in the blood. It carries fat into the blood and promotes fat accumulation in the arteries (atherosclerosis), which can lead to cardiovascular disease.

Lipids: Term used for all types of fats normally found in blood.

Monounsaturated fat: Fat contained in certain foods and their oils, such as olives, avocados, peanuts, almonds, hazelnuts, pecans, pistachios, cashews, and some soft margarines. It can reduce the level of "bad cholesterol" (LDL-C) and help maintain the level of "good cholesterol" (HDL-C).

Polyunsaturated fat: Fat contained in foods such as flaxseed, soybean, sunflower, safflower, corn, and sesame oils, some soft margarines, fish, walnuts, and pinenuts, as well as pumpkin, sesame, sunflower, and flax seeds. This fat helps reduce the level of "bad cholesterol" (LDL-C) in the blood. It includes omega-3 fatty acids, recognized as beneficial to heart health.

Protein: Element specific to living organisms and necessary for building, repairing, and renewing all organs in the human body.

Saturated fat: Fat contained in a number of foods of animal origin, such as dairy products (cheese, cream, and butter), meat, and lard, as well as certain foods of vegetable origin, such as coconut, palm kernel, and palm oils. This fat increases the level of "bad cholesterol" (LDL-C).

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