CHAPTER 2

Designing a Healthful Diet and In Depth: Phytochemicals

Chapter Summary

A healthful diet provides the proper combination of energy, nutrients, and fibre and has four characteristics: it is adequate, moderate, balanced, and varied. Many tools can be used to help design a healthful diet. The Nutrition Facts table on food labels provides valuable information to assist individuals in choosing more healthful foods. *Eating Well with Canada's Food Guide* is a set of principles developed by the Canadian government and Health Canada to assist Canadians in designing healthful diets and lifestyles.

Eating out is challenging due to the large portion sizes and high fat and sodium content of many restaurant meals. However, becoming educated can help you to make healthful choices.

Phytochemicals are plant chemicals that are believed to protect plants from injurious agents. They are not considered nutrients, but phytochemical-rich foods have been shown to reduce the risk of many chronic diseases. The benefits of phytochemicals appear to be limited to those found in foods.

Chapter Objectives

After reading this chapter, your students will be able to:

1. Describe the four characteristics of a nutritious diet.
2. Interpret the Nutrition Facts table on a food label.
3. Use the food groups and recommended number of servings in each in *Eating Well with Canada's Food Guide* to plan a nutritious diet.
4. Name at least four ways to apply guidelines for healthy eating when eating out.

Chapter Outline

I. What Is a Healthful Diet?

A. A healthful diet is adequate.

- **a.** An adequate diet provides enough of the energy, nutrients, and fibre to maintain a person's health.

B. A healthful diet is moderate.

- **a.** Moderation refers to eating any foods in moderate amounts.

C. A healthful diet is balanced.

a. A balanced diet contains the combinations of foods that provide the proper proportions of nutrients.

D. A healthful diet is varied.

a. Variety refers to eating many different foods from the different food groups on a regular basis.

II. What Tools Can Help Me Design a Healthful Diet?

A. Canada's food labels have changed!

1. Food labels can have four main components.

a. The ingredient list shows all ingredients in descending order by weight.

b. The Nutrition Facts table replaces other Nutrition Information boxes, and is required on most packaged foods.

c. Nutrient content claims are claims about the amount of a nutrient in a food.

1. Nutrient content claims have been revised so that they are based on standardized serving sizes for similar foods.

d. Health claims are statements that link a food or food component with reduced risk of disease.

1. A disease reduction claim (2011) is a statement that links a food or food ingredient with reduced risk of disease or a condition in the context of a total diet.

2. How to read and use the Nutrition Facts table on foods.

a. Serving size and servings per container information is at the top.

b. Calories, Calories from fat, and Calories from saturated + trans fats per serving.

c. Percent daily values (%DV) information tells you how much a serving of food contributes to your overall intake of a nutrient.

d. The footnote tells you that the %DV are based on an 8400 kJ (2000 Calorie) diet.

3. Logo programs can help consumers make healthier choices in grocery stores.

B. Dietary Guidance in Canada

1. *Eating Well with Canada's Food Guide (2007)* is the major tool for consumers to plan nutritious diets.

C. *Eating Well with Canada's Food Guide* contains the recommended number of servings for each food group for 9 age and gender categories.

1. This Food Guide was revised in 2007 to be consistent with the DRIs.

2. What does *Eating Well with Canada's Food Guide* tell you?

a. The rainbow side of the Food Guide tells people how to choose healthy foods using directional statements. The two outer arcs of the Food Guide have been reversed so that the green, outermost arc is now vegetables and fruit. The next yellow arc is now grain products. The blue arc contains milk and alternatives, and the red arc contains meat and alternatives.

b. The panel of the Food Guide shows the amounts of various foods that are equal to one serving and the number of servings recommended each day, based upon age and gender.

c. "Other Foods" (the term used in the previous food guide) are foods that are equal to one serving and the number of servings recommended each day, based upon age and gender.

3. What is one Food Guide Serving in *Eating Well with Canada's Food Guide*?

a. There is no standardized definition of a serving size for any food: a serving size as defined in the Food Guide may not be equal to a serving size on a product label.

b. Serving sizes listed in the Food Guide are typically smaller than the amounts we normally eat or are served.

c. Accompanying each of the 4 food groups are recommendations for the best quality, most nutrient-rich food choices to help reduce the risk of chronic disease and obesity.

d. For the first time, Canadians can visit *Eating Well with Canada's Food Guide* online at www.hc-sc.ca/fn-an/food-guide-aliment/index-eng.php and tour the guide or use the interactive tools.

e. For the first time, Health Canada has produced a food guide specifically for Aboriginal peoples: *Eating Well with Canada's Food Guide: First Nation, Inuit and Métis.*

D. Other Food Guides

1. Other countries have developed their own tools to teach their consumers how to follow their dietary guidelines.

2. The Mediterranean Diet and Pyramid is a popular diet which has health benefits (Hot Topic).

E. Choose foods high in nutrient density.

1. Nutrient-packed foods should be part of a well-rounded diet.

2. As a general guideline, people are encouraged to choose nutrient-dense foods, while emphasizing the principles of adequacy, moderation, balance, and variety.

III. Can Eating Out Be Part of a Healthful Diet?

A. The hidden costs of eating out.

1. Many restaurants serve large portions.

2. Many meals are high in sodium and fat, as well as calories.

B. The healthful way to eat out.

1. Choose smaller portions.

2. Avoid fried foods.

3. Choose items with steamed vegetables.

4. Avoid energy-rich appetizers and desserts.

5. Eat less than half of the food you are served.

a. Quick Tips: Eating Right When You're Eating Out.

IV. Nutrition Debate: Can Probiotics Improve Our Health?

A. Probiotics are "live microorganisms, which when administered in adequate amounts, confer a health benefit on the host" (FAO, 2001).

1. Probiotics must be tested to prove they have health benefits for humans.

2. Studies must identify the proper number of microorganisms required to safely provide health benefits.

3. The microorganisms must still be alive by the end of the shelf life of the product for the people to get the health benefits.

B. Are probiotics effective?

1. Yogurt and other fermented milk products contain probiotics. Probiotics are also available in supplement form.

a. Probiotics may be beneficial for some conditions in the GI tract.

b. To be effective, foods containing probiotics must provide an adequate number of bacteria, thought to be 1 to 10 billion.

V. In Depth: Phytochemicals

A. What Are Phytochemicals?

1. Phytochemicals are plant chemicals that protect plants.
2. Phytochemicals are not considered nutrients, but have been shown to reduce the risk of many chronic diseases.

B. How do phytochemicals reduce our risk of disease?

1. Phytochemicals have antioxidant properties.
2. Phytochemicals reduce inflammation.
3. Phytochemicals enhance the activity of certain detoxifying enzymes.
4. Phytochemicals slow tumor cell growth.
5. Phytochemicals protect against infections.
6. Phytochemicals reduce the risk of cardiovascular disease.

C. Is there an RDA for phytochemicals?

1. Phytochemicals interact with each other to produce a synergistic effect.
2. Phytochemicals interact with macronutrients, vitamins, and minerals.
3. No recommendation for precise amounts of phytochemicals can be given; phytochemical supplements should be avoided.
4. Hot Topic: Will a PB&J Keep the Doctor Away?

Key Terms

adequate diet (40)
balanced diet (40)
calorie (43)
disease risk reduction claim (45)
diseases of aging (69)
healthful diet (40)
metabolites (69)
moderation (40)
Nutrition Facts table (43)
percent daily values (% DV) (46)
phytochemicals (69)
Recommended Daily Intakes (48)
reference standards (48)
variety (41)

In-Class Discussion Questions

1. Examine your diet with regard to the four characteristics of a healthful diet: adequacy, moderation, balance, and variety. Do your dietary choices reflect these characteristics? What changes could you make to incorporate these features more often?
2. Do you use the information on food labels to help you choose the products you buy? If so, what criteria on the food label do you find most useful?
3. Think about three or four foods that you commonly consume. Discuss how you might replace these foods with more nutrient dense alternatives.
4. Discuss the health messages associated with *Eating Well with Canada's Food Guide*. Do you think the messages are clear?
5. What are limitations of *Eating Well with Canada's Food Guide*? Can you suggest how to overcome these limitations?
6. Discuss some of the strategies you can put into practice when eating out that can make your diet more healthful.
7. Discuss some health-promoting functions of phytochemicals. Give specific examples of foods that can provide us with these chemicals.

8. Explain how antioxidants can lower the risk of many diseases of aging.

In-Class Activities

1. Students should use the food intake journal they previously completed to determine whether their intake conforms to *Eating Well with Canada's Food Guide*. Refer pages 52 - 53 of the textbook. Students should answer the following questions:
   a. How many food guide servings do you meet?
   b. How might you change your diet or lifestyle to more closely meet the recommendations?

2. Have students bring to class three food products that contain a food label. Instruct them to examine and discuss the ingredients list and the Nutrition Facts table in small groups. Have them answer the following questions for each label:
   a. What is the ingredient present in the largest amount?
   b. What is the serving size for the product?
   c. Is the stated serving size the amount you would normally eat?
   d. What is the number of kilojoules (calories) per serving?
   e. What is the amount of fat (in grams) per serving?
   f. For each food product, discuss whether this would be considered a nutrient-dense food. Students should give reasons for their answer.

3. Have students visit a restaurant that provides nutrition facts for its meals. As an alternative, this information can be accessed online for many restaurants. Students should try to plan a healthful meal from the restaurant's menu. Discussion in class can address whether or not it was possible to find healthy options. Students should also state if they would order the healthy option if they were eating at this restaurant. Why or why not?

4. Have an "Canadian cultural feast" with groups of students using the variations of *Eating Well with Canada's Food Guide* or *Eating Well with Canada's Food Guide: First Nation, Inuit and Métis* to plan the meals.

5. Display a variety of food guides from around the world. Discuss the differences in appearance and nutrition recommendations.

6. Have students work in groups and give them each one of the following meals to improve:

- Breakfast: bagel and coffee
- Lunch: cheese burger and diet soda
- Dinner: pasta with sauce and diet soda

For each meal, ask students to suggest ways to increase the intake of phytochemicals by adding food items to the meal without changing the given food items.

7. Using the 3-day nutrition journal previously completed, have students note which foods in their journal contained phytochemicals.

8. Have students interview family and friends about *Eating Well with Canada's Food Guide*. Students should ask the following questions:
   a. Describe the appearance of the Food Guide - - what shape is it?
   b. What are the four food groups? About how many servings of each are you supposed to consume daily?
   c. Do you attempt to follow the Food Guide? If so, how successful are you?
   d. Do you find the Food Guide confusing in any way?

9. Ask students to raise their hands if they consume a coffee beverage with breakfast, lunch or dinner. Have students keep their hands in the air if that beverage is a specialty coffee (not plain, regular brewed coffee). Next, ask students if they consider their drink a meal? Show the students

that the three following meals have the approximate same number of calories (450 Calories).

a. A sandwich, made with two slices of whole wheat bread, turkey, tomato, lettuce and mustard, and 250 ml of 1% milk.
b. A 75 gram broiled T-bone steak, (trimmed), 125 ml of mashed potatoes, 125 ml of broccoli.
c. A medium (500 ml) mocha frappaccino blended coffee.

MyDiet Analysis Activity

10. Using the nutritional assessment previously completed, students should note the My-FoodGuide information provided by their diet analysis software and answer the following questions:

a. Do your intakes meet recommendations for each food group?

b. What food groups are you high in?

c. What food groups are you low in?

d. What changes can you make in your diet to more closely meet the recommendations of MyFoodGuide?

Nutrition Debate Activity

11. Have students do an Internet search or a search in a supermarket for a food (other than yogurt) containing probiotics. Ask students to analyze whether or not they believe the health claim of the manufacturer is a valid one. Discuss in class what type of evidence is used to support the health claims for the various products.

Web Resources

Main Chapter

www.dietitians.ca
Dietitians of Canada
Click on "Your Health" and then "Assess Yourself" and "EATracker" to see if your eating and physical activity patterns are on track!

www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/interactive_e.html
Health Canada's Interactive Nutrition Label
This is an interactive site to help you learn about the new food label. When you think you know the parts of the label, take the interactive quiz!

www.5to10aday.com
5-to-10-a-Day for Better Health
Visit this site to learn more about The Mix it up! Campaign, a social marketing initiative aimed at helping Canadians of all ages eat more fruits and vegetables as part of a healthy diet and active lifestyle to better their health.

www.healthcheck.org
Heart and Stroke Foundation of Canada's Health Check

Developed by the Heart and Stroke Foundation, Health Check is a non-profit food information program to promote healthy choices. Over 1500 food products in Canada carry the Health Check logo and explanatory messages on the website describe how the food products fit in a healthy diet.

www.mcdonalds.ca/ca/en/food/nutrition_calculator.html
McDonalds Canada
Log on to the nutrition calculator and select different beverages and foods to see their nutrient contents.

www.bk.com
Burger King
Trying selecting various food and beverage items from the Menu tab to see the amounts of energy and nutrients they contain.

www.inspection.gc.ca
Canadian Food Inspection Agency
If you are interested in more information about the new food labels in Canada, health claims, and so on, this is the place to find it.

www.hc-sc.gc.ca/ahc-asc/branch-dirgen/hpfb-dgpsa/onpp-bpnn/index-eng.php
Office of Nutrition Policy and Promotion, Health Canada
Learn more about *Eating Well with Canada's Food Guide* and other Canadian nutrition policies.

www.oldwayspt.org
Oldways Preservation and Exchange Trust
Find variations of ethnic and cultural food pyramids.

www.crdc-probiotics.ca
The Canadian Research & Development Centre for Probiotics
Visit this centre to learn more about Canadian research on probiotics.

In Depth: Phytochemicals

www.aicr.org
American Institute for Cancer Research
Search for "phytochemicals" to learn about the AICR's stance and recommendations about phytochemicals and their roles in cancer prevention.

http://lpi.oregonstate.edu
Linus Pauling Institute
This extensive Web site covers not only phytochemicals but also nutrients and other cutting-edge health and nutrition topics.

Additional Information

1. **Nutrition Labels**. Health Canada has developed a self-directed, web-based tool to help consumers better understand the nutrition information on food products, called the "Interactive Nutrition Label". To access this tool visit: http://www.healthcanada.gc.ca/nutritionlabelling.

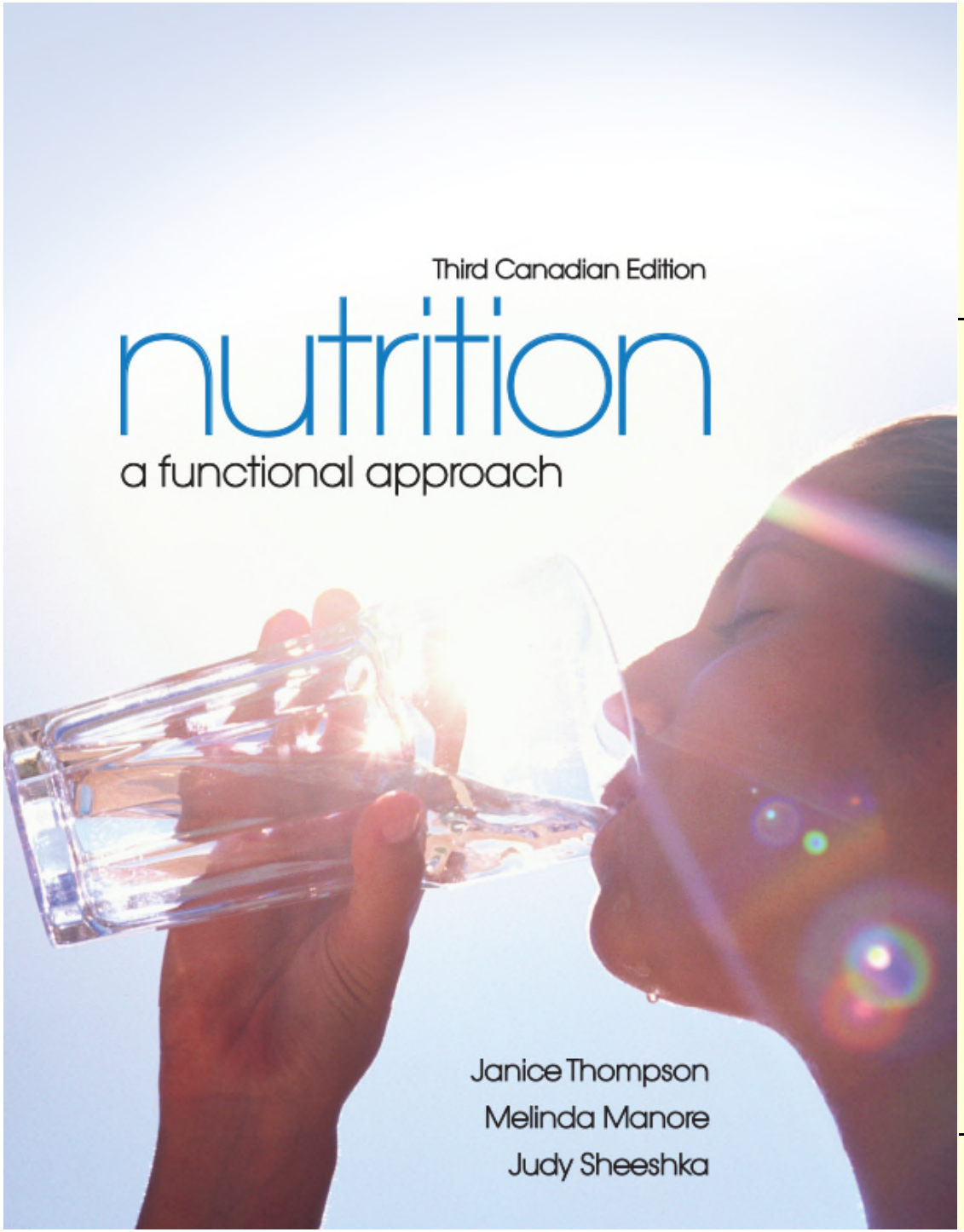
Fact sheets developed to help consumers interpret the new Nutrition Facts tables on packaged foods can be found at: http://www.healthyeatingisinstore.ca/program_resources.asp.

2. There are many interactive tools available for Canadians on the Dietitians of Canada website: www.dietitians.ca.

3. A study conducted by Health Canada illustrates that Canadians are not fully comprehending the information provided on nutrition labels. For further information on this research study, visit www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/res-rech/index.eng.php.

4. For further information about probiotics and their usage, consult the Agriculture and Agri-Food Canada website at www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=123422422297.

5. For an extensive look at research about probiotics, scientific research and probiotics and health conditions, consult the BioK+ website at www.biokplus.com.



CHAPTER

2

Designing a Healthful Diet and In Depth

A Healthful Diet

A healthful diet is

- Adequate
- Moderate
- Balanced
- Varied

A Healthful Diet Is Adequate

An adequate diet provides enough energy, nutrients, fibre, vitamins, and minerals to support a person's health

A diet adequate in many nutrients can still be inadequate in a few nutrients

A Healthful Diet Is Moderate

Another key to a healthful diet is moderation

A healthful diet contains the right amounts of foods for maintaining proper weight

A Healthful Diet Is Balanced

A balanced diet contains the right combinations of foods to provide the proper proportions of nutrients

A Healthful Diet Is Varied

Variety refers to eating many different types of foods each day

A healthful diet is not based on only one or a few types of foods

Designing a Healthful Diet

Tools for designing a healthful diet may include

- Food Labels
- Dietary Guidelines
- Logo Programs
- Food Guides

Food Labels

In Canada, food labels are required on most products

These labels can include

- Ingredient list [required]
- Nutrition Facts table [required]
- Nutrient Content claims
- Health claims

Food Labels: Exemptions

TABLE 2.1 Examples of Foods Exempt from Carrying Nutrition Information

- foods such as spices and coffee, where the amounts of nutrients required on the label would be "0"
- alcoholic drinks (with an alcohol content of more than 0.5%)
- fresh vegetables or fruits, with no added ingredients
- fresh meats
- foods sold at roadside stands, craft shows, flea markets, fairs, or farmers' markets by the person who prepared and processed them
- individual servings of food sold for immediate consumption, such as salads and sandwiches, that have not been treated or packaged to extend their durable life
- one-bite candies or desserts
- prepackaged individual portions of food intended to be served with meals or snacks by a restaurant or other commercial enterprise
- some cow and goat milk products sold in refillable glass containers

Source: Canada Gazette, Vol. 137, No. 1, January 1, 2003, "Food and Drug Act: Regulations Amending the Food and Drug Regulations," B.01.401, http://canadagazette.gc.ca/partII/2003/20030101/html/sor11-e.html (accessed January 2006). Reproduced with the permission of the Minister of Public Works and Government Services Canada, 2012.

Table 2.1

Food Labels

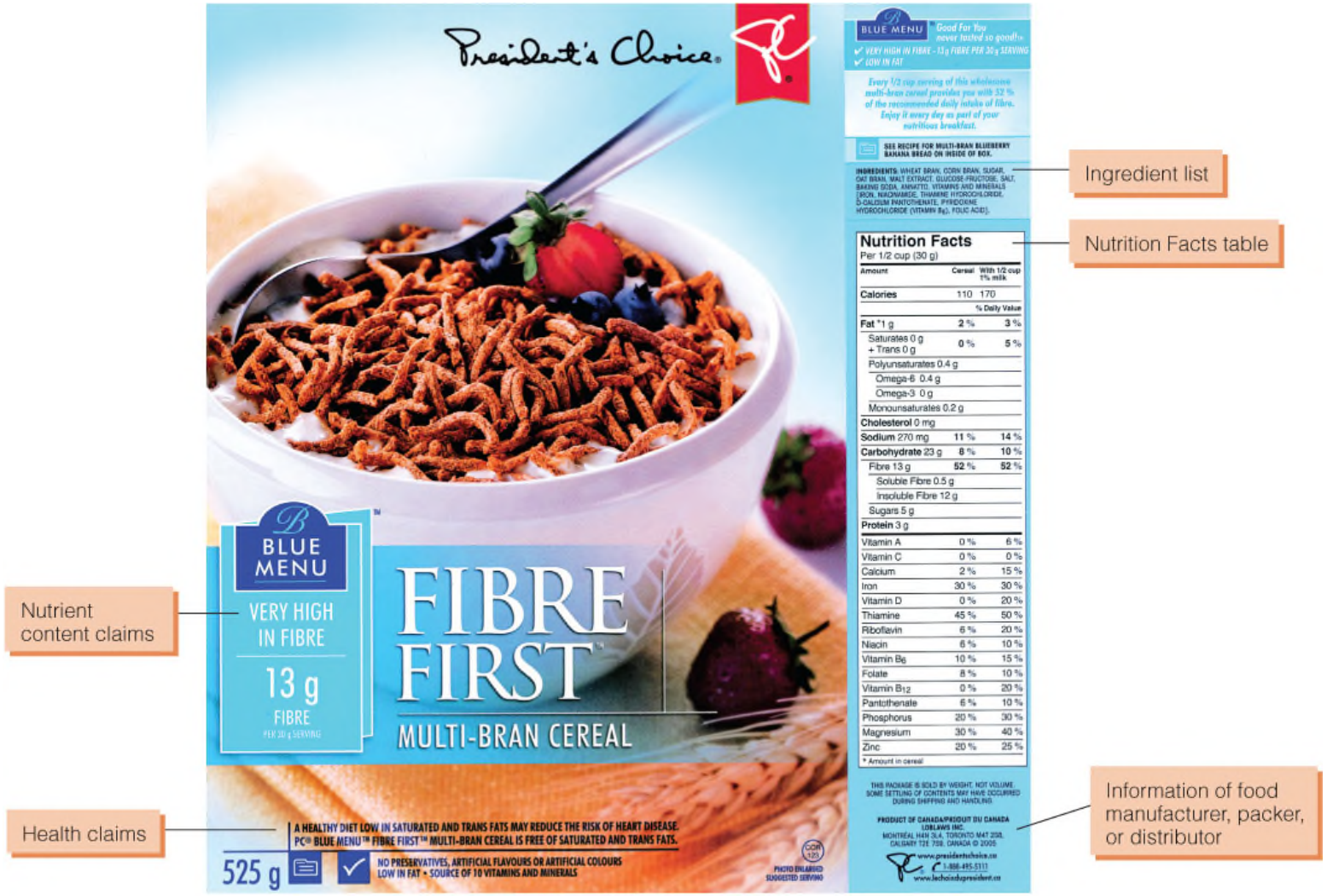


Figure 2.1 The four main parts of a food label and the contact information. (Courtesy of President's Choice®, www.presidentschoice.ca.)

Nutrition Facts Table

The Nutrition Facts table in standard format contains required nutrition information

This information can be used in planning a healthful diet

Nutrition Facts

Per 125 mL (87 g)

Amount	% Daily Value
Calories 80	
Fat 0.5 g	**1** %
Saturated 0 g + Trans 0 g	**0** %
Cholesterol 0 mg	
Sodium 0 mg	**0** %
Carbohydrate 18 g	**6** %
Fibre 2 g	**8** %
Sugars 2 g	
Protein 3 g	

Vitamin A	2 %	Vitamin C	10 %
Calcium	0 %	Iron	2 %

Figure 2.2a

Nutrition Facts Table

1. Serving size and servings per container

- Serving sizes can be used to plan appropriate amounts of food
- Standardized serving sizes allow for comparisons among similar products

Nutrition Facts Table

2. List of nutrients

- Calories
- Fat (total; saturated and trans)
- Cholesterol
- Sodium
- Carbohydrate (total; fibre, sugars)
- Protein
- Vitamin A, vitamin C, calcium, iron

Nutrition Facts Table

3. Percent Daily Values (%DV)

- Describes how much a serving of food contributes to your total intake of a nutrient
- Based on a diet of 2000 Calories per day
- Can be used to determine if a product is low or high in a particular nutrient

Nutrition Facts Table

4. Footnote

- Appears in expanded format label only
- Informs that %DV are based on a 2000-Calorie diet
- Illustrates differences in recommendations between a 2000-Calorie and 2500-Calorie diet

Standards to Calculate %DV

TABLE 2.4 Standards Used to Calculate the % Daily Value (2000 Calories or 8400 kJ)

Vitamin or Mineral Nutrient	Units	Persons 2 Years of Age or Older	Infants and Children Less than 2 Years Old
(a) Recommended Daily Intake			
Vitamin A	RE[a]	1000	400
Vitamin D	µg[b]	5	10
Vitamin E	mg[c]	10	3
Vitamin C	mg	60	20
Thiamin, thiamine, or vitamin B_1	mg	1.3	0.45
Riboflavin, or vitamin B_2	mg	1.6	0.55
Niacin	NE[d]	23	8
Vitamin B_6	mg	1.8	0.7
Folacin, or folate	µg	220	65
Vitamin B_{12}	µg	2	0.3
Pantothenic acid, or pantothenate	mg	7	2
Vitamin K	µg	80	30
Biotin	µg	30	8
Calcium	mg	1100	500
Phosphorus	mg	1100	500
Magnesium	mg	250	55
Iron	mg	14	7
Zinc	mg	9	4
Iodide	µg	160	55
Selenium	µg	50	15
Copper	mg	2	0.5
Manganese	mg	2	1.2
Chromium	µg	120	12
Molybdenum	µg	75	15
Chloride	mg	3400	1000

Nutrient	Amount
(b) Reference Standards	
Fat	65 g
The sum of saturated fatty acids and trans fatty acids	20 g
Cholesterol	300 mg
Carbohydrate	300 g
Fibre	25 g
Sodium	2400 mg
Potassium	3500 mg

[a] RE = retinol equivalents [b] µg = micrograms [c] mg = milligrams [d] NE = niacin equivalents.
Source: Canadian Food Inspection Agency. Reproduced or adapted with the permission of the Minister of Pubic Works and Government Services Canada, 2012.

Table 2.4

Logo Programs

- Assist Canadians with nutritious food choices, e.g., Heart and Stroke Foundation's Health Check

- Process is voluntary, and food manufacturers pay a lifetime fee and annual licensing fee

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Nutrient Claims

Health Canada has approved several claims related to health and disease

A nutrient must be related to a disease or health condition for which people are at risk, e.g., osteoporosis, hypertension

Nutrient Claims

TABLE 2.2 Examples of Common Nutrient Content Claims

- Claims of "free" mean that the number of kJ (kcal) or the amount of a nutrient is nutritionally insignificant in a specified amount of food. For example, to be "sodium free," a product has to contain less than 5 mg of sodium per serving. "Free of sugar" means that a product has less than 50 mg of sugar and fewer than 17 kJ (5 kcal) per serving. Other wording can be used instead of "free of sugar": "no sugar," "0 sugar," "contains no sugar," and "sugar free" all mean the same thing on a label.
- "Low" means there is a small amount of a nutrient present in 1 serving. For example, "low fat" indicates the product contains 3 g of fat or less per serving.
- "Reduced" indicates that there is at least 25% less of a nutrient in 1 serving, compared to the "original" product or a similar product. For example, Christie's Ritz 25% Less Fat™ crackers have 25% less fat than the original Ritz™ crackers. Kellogg's Frosted Flakes 1/3 Less Sugar™ cereal has 33% less sugar than the original Frosted Flakes™ product.
- "Source" means that there is a significant amount of a nutrient in 1 serving. For example, a product must contain 2 or more grams of dietary fibre to be called a "source of fibre."

Source: Health Canada. 2003. Frequently Asked Questions About Nutrition Labelling. http://hc-sc.gc.ca/fn-an/label-etiquet/nutrition/educat/te_quest-eng.php#18. (accessed September 2008).

Table 2.2

Disease Risk Reduction Claims

TABLE 2.3 Disease Risk Reduction Claims Permitted on Food Labels

Psyllium Products and Blood Cholesterol Lowering
Primary statement: "[serving size from Nutrition Facts table in metric or common household measures] of (Brand name) [name of food] with psyllium supplies/provides X% of the daily amount of the fibres shown to help reduce/lower cholesterol." For example: "1 cup (30 g) of Brand X cereal with psyllium supplies 50% of the daily amount of fibres shown to help lower cholesterol." The "daily amount" referred to in the primary statement is 7 grams psyllium fibre.
Oat Products and Blood Cholesterol Lowering
Primary statement: "[serving size from Nutrition Facts table in metric and common household measures] of (Brand name) [name of food] [with name of eligible fibre source] supplies/provides [X% of the daily amount] of the fibres shown to help reduce/lower cholesterol." For example: If the eligible fibre source is a food itself: "1 cup (X g) of Quaker Oatmeal supplies X% of the daily amount of the fibres shown to help reduce cholesterol" If the eligible fibre source is an ingredient: "1 muffin (X g) with oat bran provides X% of the daily amount of the fibres shown to help lower cholesterol" The "daily amount" referred to in the primary statement is 3 grams beta-glucan oat fibre.
Plant Sterols (Phytosterols) and Blood Cholesterol Lowering
Primary statement: "[serving size from Nutrition Facts table in metric and common household measures] of [naming the product] provides X% of the daily amount of plant sterols shown to help reduce/lower cholesterol in adults." Two additional statements that could be used in combination or alone: 1. "Plant sterols help reduce [or help lower] cholesterol." 2. "High cholesterol is a risk factor for heart disease." The "daily amount" referred to in the primary statement is 2 grams.
Calcium and Osteoporosis
"A healthy diet with adequate calcium and vitamin D, and regular physical activity, help to achieve strong bones and may reduce the risk of osteoporosis. (Naming the food) is an excellent source of calcium and vitamin D." There are five other slight variations in wording allowed for this claim.
Fruits, Vegetables and Cancer
"A healthy diet rich in a variety of vegetables and fruit may help reduce the risk of some types of cancer." The following are excluded from this claim: potatoes, yams, cassava, plantain, corn, mushrooms, mature legumes and their juices, jams and jellies, olives, and powdered fruits and vegetables.
Dietary Fat, Saturated Fat, Cholesterol, Trans Fatty Acids and Coronary Heart Disease
"A healthy diet low in saturated and trans fats may reduce the risk of heart disease. (Naming the food) is low in saturated and trans fats."
Sodium and Hypertension
"A healthy diet containing foods high in potassium and low in sodium may reduce the risk of high blood pressure, a risk factor for stroke and heart disease. (Naming the food) is a good source of potassium and is low in sodium." There are five other slight variations in wording allowed for this claim.

Source: Health Claim Assessments. Health Canada, 2010. Minister of Public Works and Government Services Canada, 2012.

Table 2.3

Food Guide

Eating Well with Canada's Food Guide (2007)

- Originated as *Canada's Official Food Rules* in 1942
- Designed to reduce the risk of chronic disease and obesity and to help people get all of the nutrients they need for good health
- Available in English, French, and 10 additional languages

Food Guide

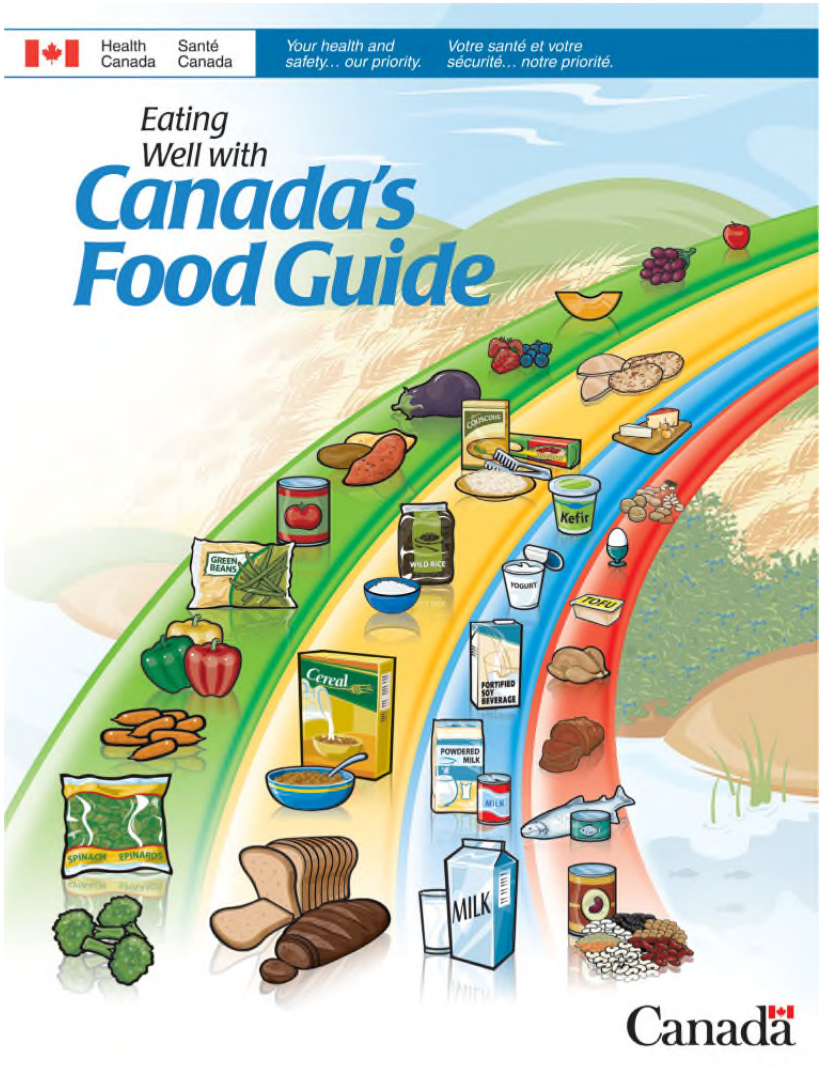


Figure 2.5 *Eating Well with Canada's Food Guide* cover. The four arcs of the rainbow represent the four food groups.

Source: Eating Well with Canada's Food Guide, http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php. © Her Majesty the Queen in Right of Canada, represented by the Minister of Health Canada, 2007. HC Pub.:4651, Cat.:H164-38/1-2007E, ISBN:0-662-44467-1.

Figure 2.5

Food Guide

Food groups

- Vegetables and Fruit
- Grain Products
- Milk and Alternatives
- Meat and Alternatives

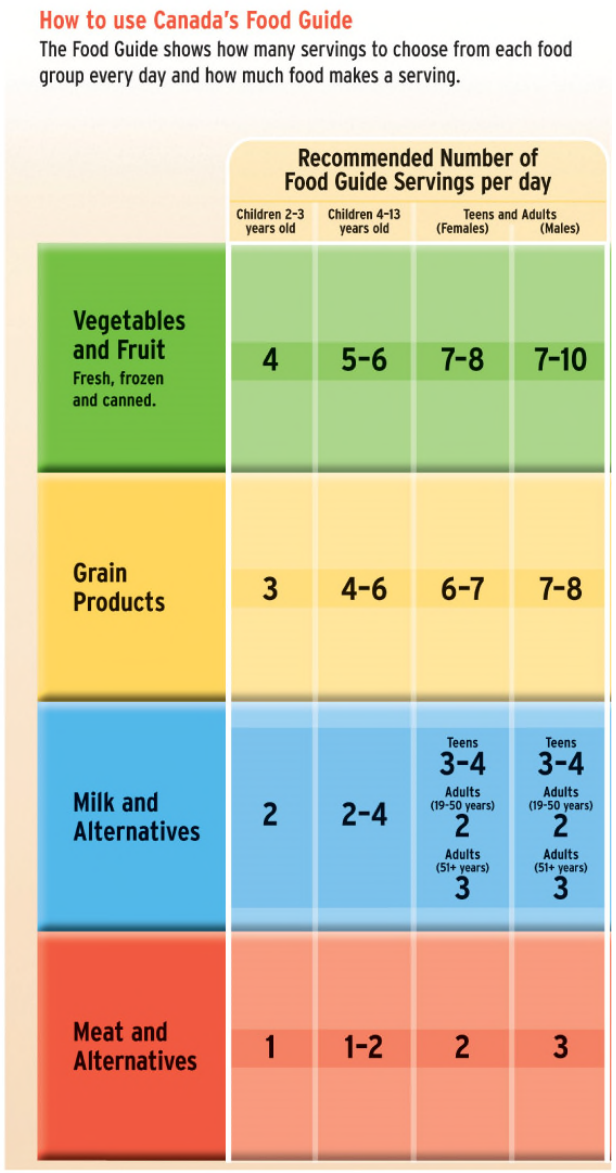
Food Guide

Food Guide Servings for 9 age/gender groups

- Children: 2-3 yrs, 4-8 yrs, 9-13 yrs
- Teens: 14 – 18 yrs (males, females)
- Adults: 19-50 yrs (males, females)
  51 + yrs (males, females)

Food Guide

Figure 2.6 *Eating Well with Canada's Food Guide* recommended number of *Food Guide* servings per day from each of the four food groups.
Source: Recommended Number of Food Guide Servings Per Day, http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/basics-base/quantit-eng.php, Health Canada, 2007. Reproduced with the permission of the Minister of Public Works and Government Services Canada, 2012.



How to use Canada's Food Guide

The Food Guide shows how many servings to choose from each food group every day and how much food makes a serving.

	Recommended Number of Food Guide Servings per day			
	Children 2–3 years old	Children 4–13 years old	Teens and Adults (Females)	Teens and Adults (Males)
Vegetables and Fruit Fresh, frozen and canned.	4	5–6	7–8	7–10
Grain Products	3	4–6	6–7	7–8
Milk and Alternatives	2	2–4	Teens 3–4 Adults (19–50 years) 2 Adults (51+ years) 3	Teens 3–4 Adults (19–50 years) 2 Adults (51+ years) 3
Meat and Alternatives	1	1–2	2	3

Figure 2.6

Food Guide

Serving Sizes

- There is no standardized definition of a serving size for any food
- A serving size as defined in Canada's Food Guide may not be equal to a serving size listed on a food label

Food Guide

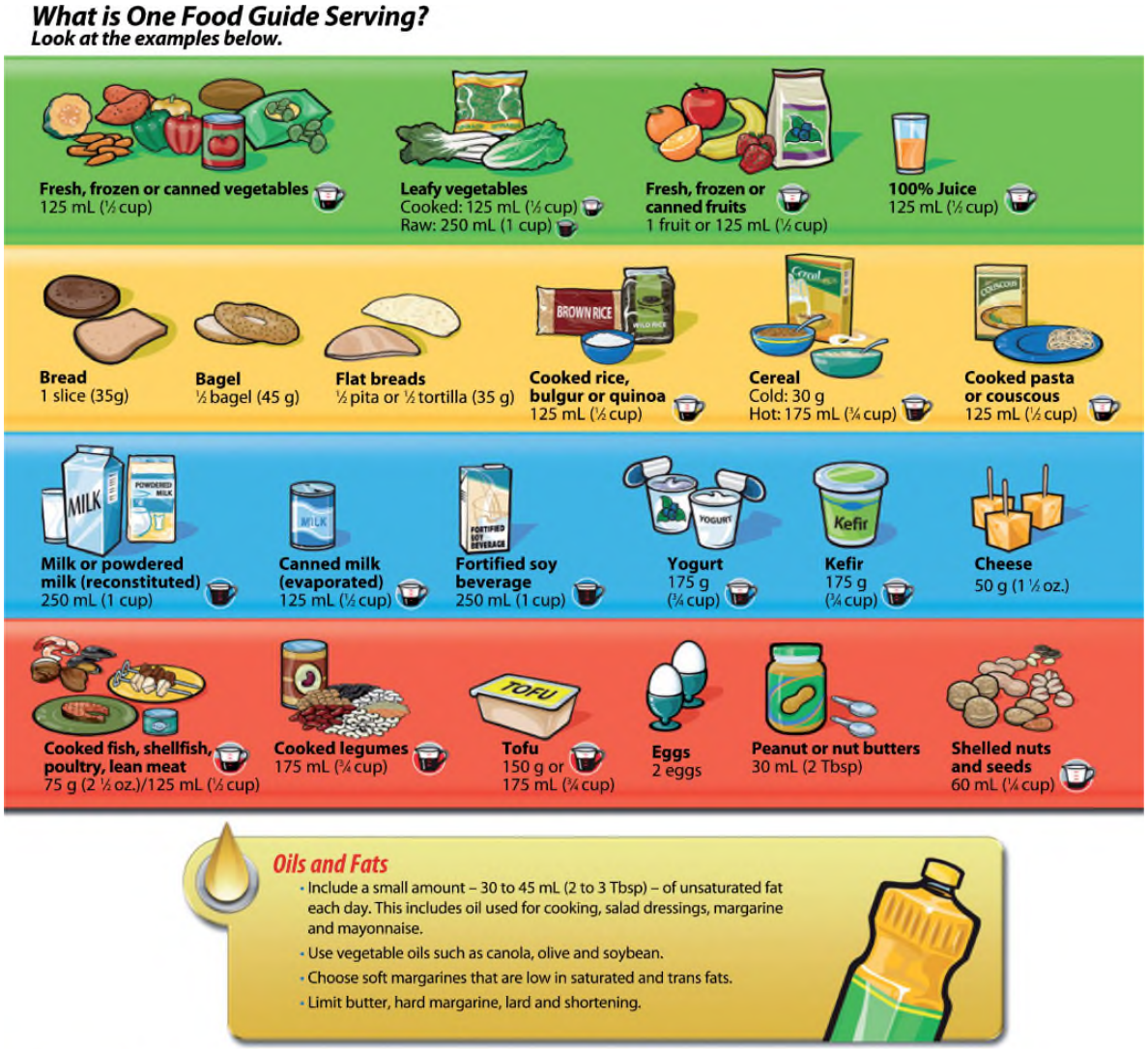


Figure 2.7 *Eating Well with Canada's Food Guide* suggested serving sizes. The amount shown for each food represents one food guide serving.

Source: Eating Well with Canada's Food Guide. Health Canada, 2011. Minister of Public Works and Government Services Canada, 2012.

Figure 2.7

Practical Portion Sizes

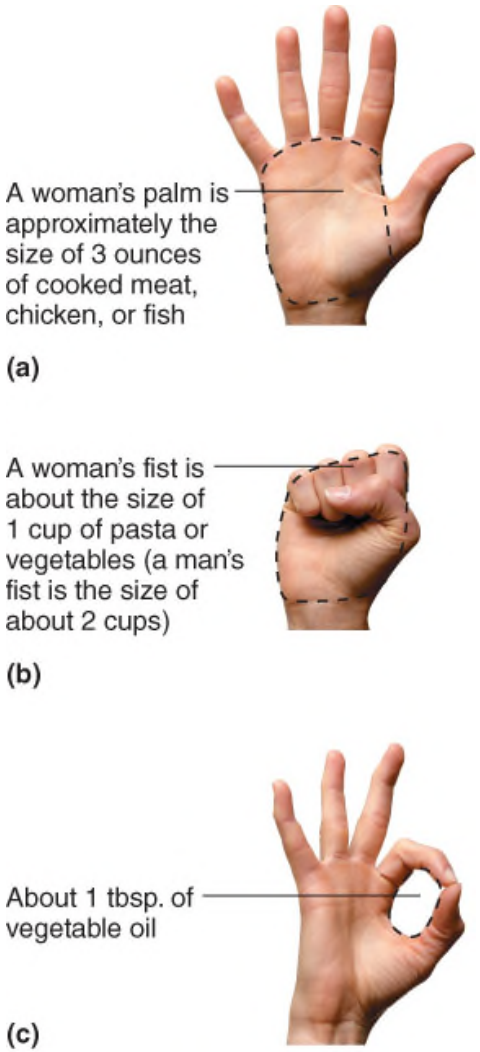


Figure 2.8 Use your hands to help you estimate the serving sizes of common foods.

Figure 2.8

Food Guide

Vegetables and Fruit

- Choose 1 dark green and 1 orange vegetable each day
  - Go for dark green vegetables, such as broccoli, romaine lettuce, and spinach
  - Go for orange vegetables, such as carrots, sweet potatoes, and winter squash
- Choose vegetables and fruit prepared with little or no fat
  - Enjoy vegetables steamed, baked, or stir-fried instead of deep-fried
- Have vegetables and fruit more often than juice

Food Guide

Grain Products

- Make at least half your grain products whole grain each day
  - Eat a variety of whole grains, such as barley, brown rice, oats, quinoa, and wild rice
  - Enjoy whole grain breads, oatmeal, or whole wheat pasta
- Choose grain products that are lower in fat, sugar, or salt
  - Compare the Nutrition Facts table on labels to make wise choices
  - Enjoy the true taste of grain products, i.e., use sauces and spreads sparingly

Food Guide

Milk and Alternatives

- Drink skim, 1%, or 2% milk each day
  - Have 500 mL of milk each day for adequate vitamin D
  - Drink fortified soy beverages if you do not drink milk
- Select lower-fat milk alternatives
  - Compare the Nutrition Facts table on yogurts or cheeses to make wise choices

Food Guide

Meat and Alternatives

- Have meat alternatives, such as beans, lentils and tofu, often
  - Choose such fish as char, herring, mackerel, salmon, sardines and trout
- Eat at least 2 Food Guide Servings of fish each week

Food Guide

Meat and Alternatives (continued)

- Select lean meat and alternatives prepared with little or no added fat or salt
  - Trim the visible fat from meats. Remove the skin on poultry
  - Use cooking methods, such as roasting, baking, or poaching, that require little or no added fat
  - If you eat luncheon meats, sausages, or prepackaged meats, choose those lower in salt (sodium) and fat

Food Guide

Recommendations for oils and fats

- Include a small amount – 30 to 45 mL (2 to 3 Tb) – of unsaturated fat each day
- Use vegetable oils, such as canola, olive, and soybean
- Choose soft margarines that are low in saturated and trans fats
- Limit butter, hard margarine, lard, and shortening

Food Guide

Advice for different ages and stages

Children

- Serve small nutritious meals and snacks each day
- Do not restrict nutritious foods because of their fat content

Women of childbearing age

- Take a multivitamin containing folic acid every day

Men and women over 50

- Take daily vitamin D supplement of 10μg(400 IU)

Food Guide

Eating Well with Canada's Food Guide

First Nation, Inuit, and Métis

- For the first time, Canada has produced a food guide specifically for Aboriginal peoples

Food Guide

Figure 2.10 *Eating Well with Canada's Food Guide: First Nation, Inuit and Métis.*

Source: Eating Well with Canada's Food Guide: First Nations, Inuit and Métis. Health Canada, 2007. Reproduced with the permission from the Minister of Health.

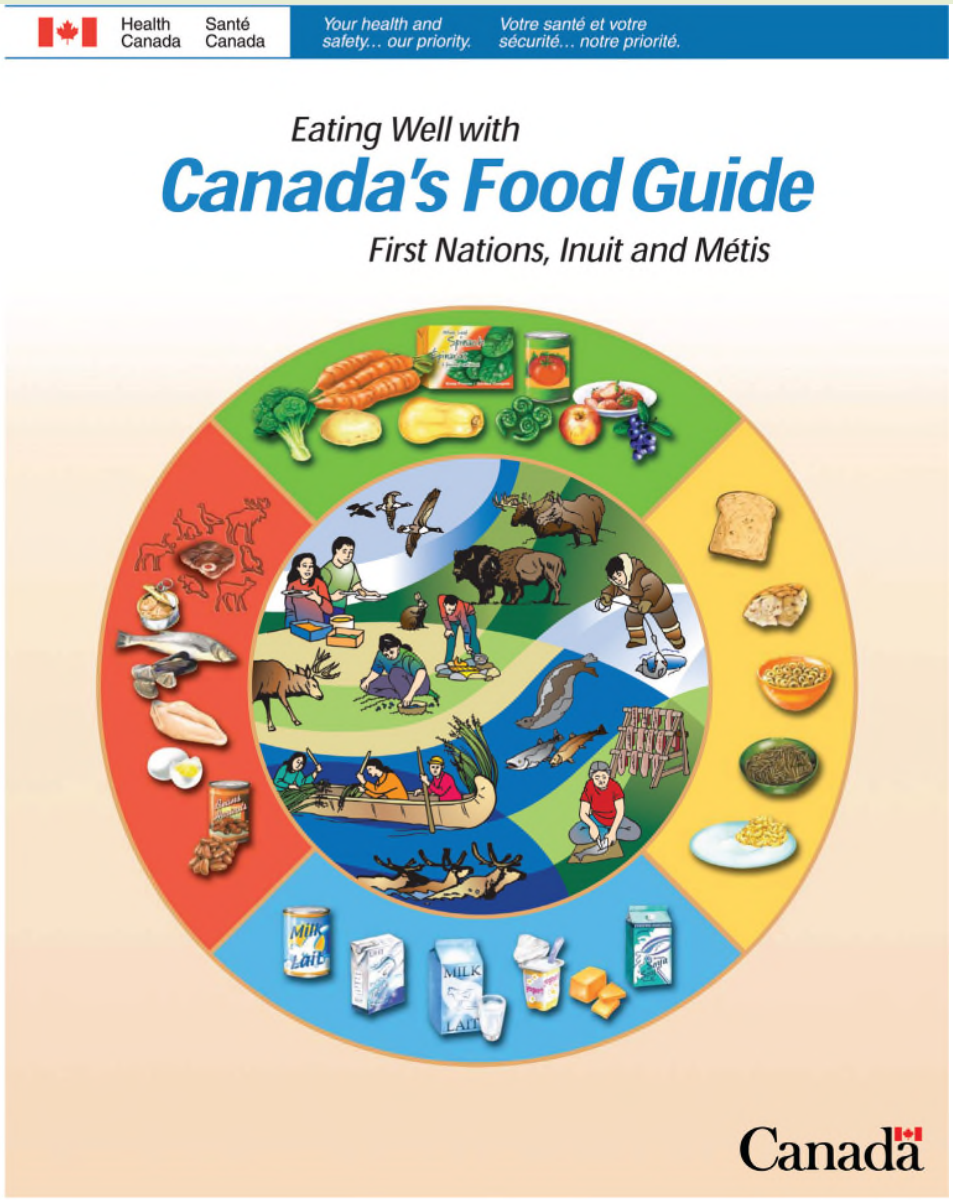


Figure 2.10

Food Guide

Other Food Guides in North America include

- Vegetarian Food Guide for North America
- Mediterranean Diet Pyramid

Mediterranean Diet Pyramid

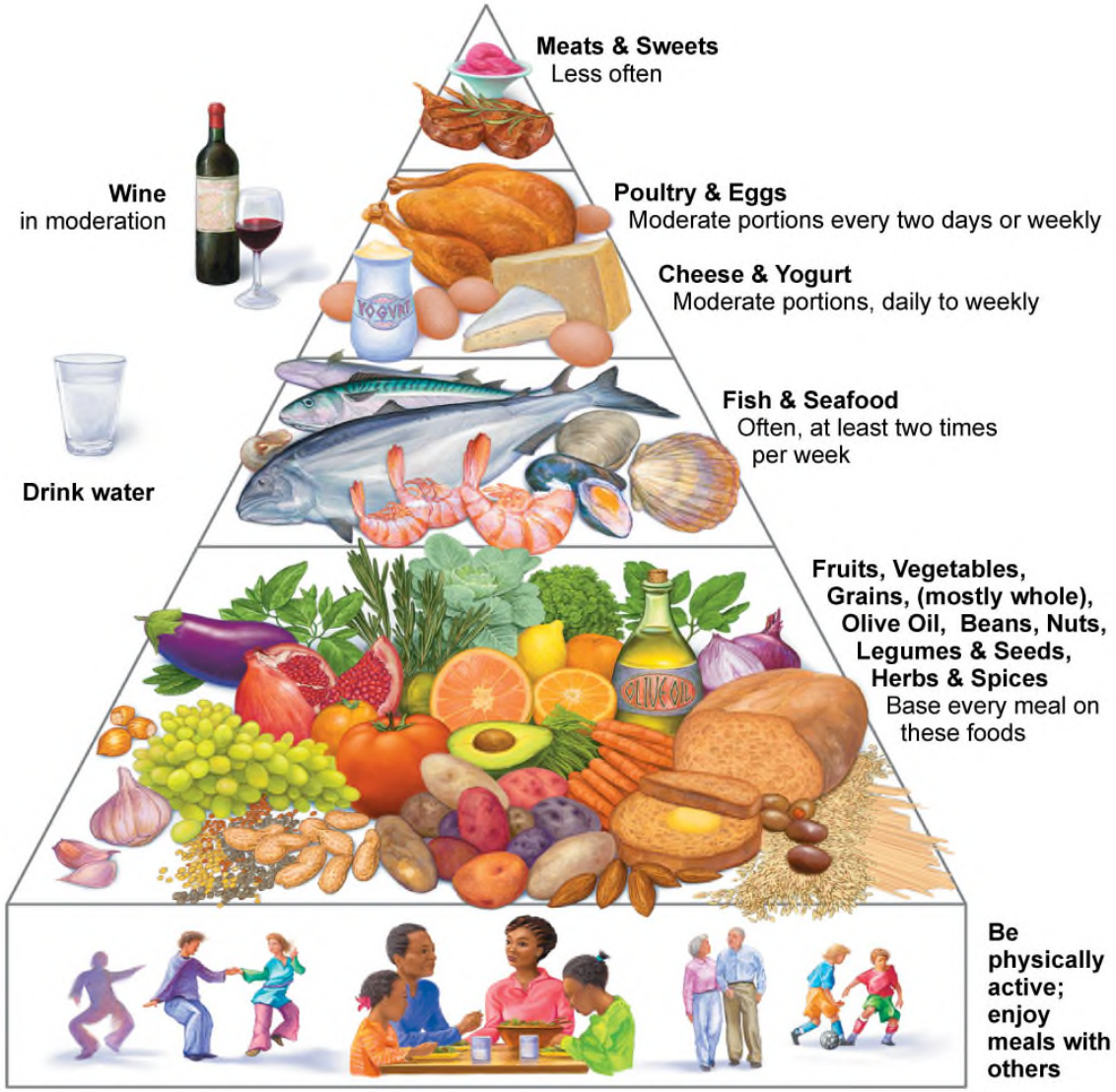


Figure 2.12

Diet Plans

When making choices in each food group, nutrient dense foods are the best choice

Nutrient density: the relative amount of nutrients per Calorie of food

Low vs. High Nutrient Density

Figure 2.13 Examples of foods that are low and high in nutrient density. **(a)** Three chocolate sandwich cookies; **(b)** The combination of one medium banana and 125 mL (1/2 cup) fresh blackberries. Each bowl of food provides approximately 600 kJ (145 kcal). The cookies provide 230 kJ (56 kcal) from fat (6.2 grams), 1 gram of fibre, and very few vitamins and minerals. The fruit combination provides almost 7 grams of fibre, 32 kJ (8 kcal) from fat (0.85 grams), and a significant amount of other nutrients, such as potassium (608 mg), vitamin A (21 RE), and vitamin C (26 mg). For our limited daily energy budget, the fruit is richer in nutrients (more nutrient-dense) and a more healthful choice. (Calculated using USDA Nutrient Database for Standard Reference, Release 15, September 2002.)

Figure 2.13

Can Eating Out Be Part of a Healthful Diet?

Eating in restaurants often involves

- High-fat foods
- Large portion sizes

A restaurant meal can be equivalent to the recommended fat or calorie intake for an entire day

Eating Right When You're Eating Out

Tips for restaurant meals

- Avoid breaded or fried foods
- Order salad (with dressing on the side) instead of soup
- Ask for steamed vegetables
- Substitute vegetables for potatoes or rice
- Avoid cream sauces or cheese sauces
- Order small portions (such as appetizers)

In Depth: Phytochemicals

What are phytochemicals?

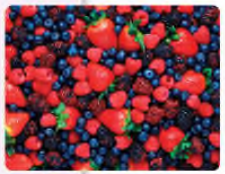
- Compounds in foods found in plants that are thought to be beneficial to health
- Not considered nutrients (substances necessary to sustain life)
- More than 5000 phytochemicals have been identified

In Depth: Phytochemicals

What are phytochemicals? (continued)

- No daily recommended intakes have been established
- Links have been shown to reduced risk for cardiovascular disease, cancer, diabetes, Alzheimer's, cataracts, and age-related decline

In Depth: Phytochemicals

Phytochemical	Health Claims	Food Source	
Carotenoids: alpha-carotene, beta-carotene, lutein, lycopene, zeaxanthin, etc.	Diets with foods rich in these phytochemicals may reduce the risk for cardiovascular disease, certain cancers (e.g., prostate), and age-related eye diseases (cataracts, macular degeneration).	Red, orange, and deep-green vegetables and fruits, such as carrots, cantaloupe, sweet potatoes, apricots, kale, spinach, pumpkin, and tomatoes	
Flavonoids:[1] flavones, flavonols (e.g., quercetin), catechins (e.g., epigallocatechin gallate or EGCG), anthocyanidins, isoflavonoids, etc.	Diets with foods rich in these phytochemicals are associated with lower risk for cardiovascular disease and cancer, possibly because of reduced inflammation, blood clotting, and blood pressure and increased detoxification of carcinogens or reduction in replication of cancerous cells.	Berries, black and green tea, chocolate, purple grapes and juice, citrus fruits, olives, soybeans and soy products (soy milk, tofu, soy flour, textured vegetable protein), flaxseed, whole wheat	
Phenolic acids:[1] ellagic acid, ferulic acid, caffeic acid, curcumin, etc.	Similar benefits as flavonoids.	Coffee beans, fruits (apples, pears, berries, grapes, oranges, prunes, strawberries), potatoes, mustard, oats, soy	
Phytoestrogens:[2] genistein, diadzein, lignans	Foods rich in these phytochemicals may provide benefits to bones and reduce the risk for cardiovascular disease and cancers of reproductive tissues (e.g., breast, prostate).	Soybeans and soy products (soy milk, tofu, soy flour, textured vegetable protein), flaxseed, whole grains	
Organosulfur compounds: allylic sulfur compounds, indoles, isothiocyanates, etc.	Foods rich in these phytochemicals may protect against a wide variety of cancers.	Garlic, leeks, onions, chives, cruciferous vegetables (broccoli, cabbage, cauliflower), horseradish, mustard greens	

[1] Flavonoids, phenolic acids, and stilbenes are three groups of phytochemicals called phenolics. The phytocemical Resveratrol is a stilbene. Flavonoids and phenolic acids are the most abundant phenolics in our diet.
[2] Phytoestrogens include phytochemicals that have mild or anti-estrogenic action in our body. They are grouped together based on this similarity in biological function, but they also can be classified into other phytochemical groups, such as isoflavonoids.

Figure 1 In Depth