Nutrition Concepts and Controversies (Canadian) 4th edition Sizer Solutions Manual

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2 Nutrition Tools—Standards and Guidelines

IF NOTHING ELSE, MY STUDENTS SHOULD LEARN…

1. That nutrient recommendations are guidelines for measuring healthy people's energy and nutrient intakes. The amounts of energy and selected nutrients considered adequate to meet the nutrient needs for the majority of healthy people are set by nutrition experts.
2. That dietary guidelines apply principles of good eating and offer practical advice about healthy eating.
3. The different Dietary Reference Intakes (DRI) and how to interpret them when reading nutritional labels on various food items.
4. That one tool for diet planning is Canada's Food Guide. This plan sorts foods into four major food groups (grain products, vegetables and fruit, milk products, meat and alternatives) based on nutrient contents. Food labels containing nutrition facts provide reliable information to help consumers select their food choices.
5. That the major nutrients are contained within the four groups outlined by Canada's Food Guide.
6. How to read the nutrient label on commercial food items. With the knowledge gained in this nutrition course, the elements of the nutrient label will be much more meaningful.

LEARNING OBJECTIVES

Students should be able to:

- LO 2.1: Explain how RDI, AI, DV, and EAR serve different functions in describing nutrient values, and discuss how each is used. *[Remember/Understand]*
- LO 2.2: Describe how foods are grouped in Canada's Food Guide; the USDA's MyPlate, and other international food guides: and describe the concepts of *nutrient density* and *discretionary Calorie allowance*. *[Remember]*
- LO 2.3: Describe some tools Canadians can use to assess the quality of their diet. *[Remember/Understand]*
- LO 2.4: Discuss the information included on food labels. *[Remember/Understand]*

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- LO 2.5: Summarize the potential health effects of functional foods and various phytochemicals from both food sources and supplements. *[Remember/Apply]*

WHY IS THIS CHAPTER IMPORTANT TO SCIENTISTS AND HEALTH-CARE PRACTITIONERS?

- The **health-care practitioner** will be acutely aware of the DRI when making recommendations to individuals seeking to improve their nutritional profile. By considering the different intakes (e.g., AI, RDA, and UL), the **health-care practitioner** can take an accurate view of such intakes to ensure that patients/clients are within a safe nutritional zone.

- The DRI, as well as the estimated energy recommendations (i.e., the estimated energy requirement and the acceptable macronutrient distribution range), will serve as a basis for the **health-care practitioner** in making nutrient recommendations. Coupled with information related to the link between nutrition and chronic diseases, and their risk factors, an effective approach of improving the overall health and physical fitness of patients/clients can be achieved.

- Canada's Food Guide incorporates the basic elements of food categories in making easy to understand recommendations for a healthy diet for Canadians. In promoting dietary independence, the **health-care practitioner** can utilize the guide along with specific dietary planning to improve the health and well-being of clients/patients.

- With the vast amount of food available to the Canadian consumer, the **health-care practitioner** can make effective use of exchange lists to develop a healthy diet plan while still catering to the ethnicity and tastes of individuals. Based upon a popular meal-planning guide, *Beyond the Basics: Meal Planning for Healthy Eating, Diabetes Prevention and Management*, effective dietary advice can be provided to Canadians that extends the basic elements in Canada's Food Guide.

- At one time, **scientists** believed that phytochemicals in foods played limited roles in human health. Phytochemical functions were thought to include only their well-known sensory properties, such as taste, aroma, texture, and colour. Today, **scientists** recognize that some phytochemicals have profound effects on the body by acting as antioxidants, mimicking hormones, and altering blood constituents in ways that may protect against some diseases. Research is currently being conducted in this area to learn more about the benefits of phytochemicals and to prove that they are safe and effective before the foods containing them can be marketed.

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WHY SHOULD STUDENTS CARE?

- In order for students to make sound nutrition-related choices, they should understand the DRI. Students should know (but not necessarily memorize) that the macro- and micronutrients carry a recommended amount for ingestion (i.e., through the RDA or AI) and that excessive amounts of some nutrients (i.e., above the UL) will lead to toxicity symptoms.

- Students should know that following Canada's Food Guide helps people eat well. Canada's Food Guide specifies the amounts of foods from each food group that Canadians need to consume in order to meet their nutrient requirements without exceeding their Calorie allowances. Canada's Food Guide is a flexible tool and can be used by different individuals.

- Learning about exchange lists is important for the study of nutrition. Careful diet planning is required for those wishing to control Calories, those with diabetes, and those who need to control their intake of fat. Exchange lists facilitate Calorie control by providing an understanding of how much carbohydrate, fat, and protein are in each food group.

- Students need to know that in order to avoid consuming too many Calories, people must pay attention to the sizes of their food servings. **Classroom Activity 2–2:** Estimation of Food Portions and Serving Sizes is useful for teaching students the proper sizes of food portions.

- The ingredients in the food that we purchase, as well as the amounts of macro- and micronutrients, are indicated on their nutrient labels. It is important for students to know how to read these food labels effectively so that they can make informed decisions about food choices. Consumers should understand these nutrient labels so that they can independently evaluate foods without relying on potentially misleading claims.

- Canadian consumers are bombarded with labels on foods, such as "refined," "whole grains," "enriched," and "fortified." These terms will be more meaningful if students develop a keen sense of the structure of a wheat plant and how the different parts of it are used or removed during the processing of food.

WHAT ARE COMMON STUDENT MISCONCEPTIONS/STUMBLING BLOCKS?

1. Students often have difficulty remembering the terms, abbreviations, and definitions of all of the different DRI. Distributing a handout that summarizes these terms is helpful for students to remember them (see **Handout 2–1**).

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2. Accurately estimating the proper portion sizes of foods is difficult for students. To overcome this, bring in models or actual food portions that can be displayed in class or during a seminar (**Classroom Activity 2–2** can help with this).

3. Students tend to be skeptical about the efficacy of phytochemicals and functional foods. They have difficulty understanding what these chemicals are and how they work. A discussion on the information available (as described in Controversy 2, pages 64–72) to support the efficacy of these chemicals is helpful to students.

4. Students sometimes have difficulty understanding and applying exchange lists when developing sound nutritional diets. By working examples of exchanging various amounts of macronutrients, students will gain a better appreciation of and competency with using exchange lists.

WHAT CAN I DO IN CLASS?

A variety of activities can be done in class. Listed below are some activities that will help students learn about Canada's Food Guide, proper diet, and food portions.

Classroom Activity 2–1: Compare Your Food Intake to Canada's Food Guide

Objective: Reflect on diet Class size: Any
Instructions: Provide students with a copy of **Handout 2–2** (Compare Your Food Intake to Canada's Food Guide). Instruct them to record everything they ate on the previous day, including beverages and snacks. Assist them with estimating food portions and translating their food selections into food groups. Have them complete their total food group intakes for the entire day and compare these to the recommendations in the food guide. Discuss ways that they can improve their dietary habits.

Classroom Activity 2–2: Estimation of Food Portions and Serving Sizes*

Objective: Estimate portions Class size: Small
Instructions: Have students estimate actual food portions in class. Bring premeasured portions of commonly consumed foods and various-sized bowls, cups, plates, etc. For example, bring a cooked beef patty, salad, various vegetables, pasta, rice, ready-to-eat cereal, chips, popcorn, margarine, peanut butter, and jam. Place these around the room and have students try to estimate the portion sizes. At the same time, discuss how to record food portions, e.g., millilitres (mL) versus cups, weight versus volume, etc. Then discuss the portion sizes.

*Activity provided by Caroline Roberts, Nutrition Education Specialist, California Department of Education, and Instructor, Sierra College, Rocklin.

Classroom Activity 2–3: Discuss Nutrient Density

Objective: Review nutrient density Class size: Any
Instructions: Reinforce the concept of nutrient density by comparing selected nutrients of equal Calorie amounts of orange juice and oranges. There is considerably more fibre, calcium, iron, and riboflavin in oranges than in orange juice.

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Classroom Activity 2–4: Label Analysis*

Objective: Analyze and understand labels Class size: Small
Instructions: Have students bring in boxes, cans, or any packages with labels. Examine and discuss the Nutrition Facts panel and ingredients. This activity helps students become more aware of the terms on labels. When students bring in the labels, they usually become more deeply involved in learning. Also, many times they bring in new products the instructor may not have seen yet, which facilitates learning for the instructor as well as the student.

*Activity provided by Pat Rogers, Allan Hancock College.

Classroom Activity 2–5: An International Luncheon*

Objective: Try new things Class size: Small
Instructions: Try an international luncheon to teach students about foodways of Canadians of different ethnic groups. Have students in your class research different foodways that are of particular interest to them and present an oral report to the class. Alternatively, students of different ethnic groups may present and discuss foods they prepare at home. A supplementary activity that students enjoy is to have them bring a food prepared at home to a potluck luncheon or dinner. This activity introduces native foods and traditional customs of countries around the world. Everyone is encouraged to sample all foods.

*Activity provided by Ruth Thornley of West Shore Community College.

Classroom Activity 2–6: Discuss How Advertisements Influence Food Choices

Objective: Analyze advertising Class size: Any
Instructions: The campaign to enhance the public image of chocolate milk is the "Recharge with Milk" campaign. Encourage students to name other food campaigns and discuss their nutrition merits.

Classroom Activity 2–7: A Nutrition Fair to Promote Canada's Food Guide*

Objective: Understand Canada's Food Guide Class size: Any
Instructions: Most effective nutrition educational presentations involve active participation. According to Confucius: "I hear and I forget; I see and I remember; I do and I understand." Have students develop a nutrition fair using Canada's Food Guide as a theme. Select a date and location and instruct students to organize activities and materials for different booths that teach each part of Canada's Food Guide. Each booth must have an activity. Some suggestions for activities are an exercise quiz, a healthy-eating quiz, a food group puzzle, an alcohol trivia quiz, and a saturated/*trans* fat reduction program. This activity is beneficial in that it incorporates active participation, self-assessment, and intention to change. This activity can be done individually or in groups. Group activity works better for larger class sizes.

*Adapted from M. Link-Mullison and N. L. Anderson, Hands-on activities to increased learning about the Dietary Guidelines, *Journal of Nutrition Education* 27 (1995): 157A.

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Classroom Activity 2–8: Newspaper Articles*

Objective: Discuss media representations of nutrition Class size: Any
Instructions: Have students collect current newspaper articles about nutrition and post them on the classroom bulletin board. This activity encourages discussion of current nutrition topics, which helps bring the lectures and readings into students' lives. The public health nurse or dietitian is also an excellent resource for nutrition information. Ask him or her to discuss various public health nutrition initiatives or conduct a food demonstration for the class.

*Activity provided by Cathy M. Pippin of Northeast Mississippi Junior College.

Classroom Activity 2–9: Review—Canada's Food Guide Jeopardy!*

Objective: Fun with Canada's Food Guide Class size: Any
Instructions: Create a Jeopardy game board with four category columns. Each column should have a category name (e.g., vegetables and fruits). Under each category name, have five game cards, each with a different answer that is relevant to the particular category of interest. Have the game cards increase in "point" value. The students are required to state their answer in the form of a question. If this process is too involved for your class, you can write the answers on the cards and allow students to provide the simple questions. This activity can be conducted in large classes, in which teams compete, or in small groups. This activity can also be adapted for other nutrition, wellness, and activity topics. Try this game with Canada's Food Guide. It creates an atmosphere for application and fun!
*Activity provided by Don Simpson, University of Arkansas, Fayetteville.

Classroom Activity 2–10: Do It Yourself—Crafting Consumer Tips

Objective: Market Canada's Food Guide Class size: Any
Instructions: Imagine that you are creating a marketing campaign to promote Canada's Food Guide to consumers. Develop a list of specific tips to guide and motivate your audience to comply with each of the recommendations. Create your own tips customized to the needs, likes, and dislikes of your particular audience. The more focused and individualized your messages are, the more likely consumers will act on them.

Critical Thinking Questions[1]

These questions will also be posted to the book's website so that students can complete them online and e-mail their answers to you.

1. **To fully gain command of their dietary intake, consumers should know how to read food labels. Many find reading food labels very confusing. Why do you believe that consumers find food labels hard to read? Describe how you, if you were a registered dietitian, would educate your client on reading a food label. What do you think would be your priority point of education for your client?**

Answer: Here, students can take a variety of approaches to the same end. The first question concerning why they think consumers find reading food labels confusing or difficult is posed to get them thinking about how their clients will approach a task. There are of course many

[1] Contributed by Kathleen Rourke.

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factors, such as many unknown terms, many terms that sound like math (which may instantly "turn off" many individuals), all sorts of numbers that appear to have no relationship to each other, and servings that are difficult to picture. Students will probably present many more factors.

Again, students' approach will be variable, but it should be systematic. Dietitians should begin with gaining a full understanding of clients' ability to comprehend the terms, calculate simple equations, read, and write. It is important for dietitians to know that we have a significant problem with illiteracy in our country. The more dietitians understand clients' basic abilities, the greater their chance of educating the clients. Dietitians also need to assess clients' Caloric needs and any medical nutrition therapy necessary. Then, it is very important that clients have a clear understanding of what a serving size is for each food group and type of food. This may be a session or more in itself before dietitians can begin to help clients understand each term and its importance. Much of this can also be done with the serving sizes and food models and then duplicated for better recall. Finally, dietitians can move into working with clients on calculating their personal Daily Values. For some clients, dietitians may only want to give some examples or estimates of what clients should be looking for on the food label, as clients may not be able to calculate their daily needs. This is why it is important to be very familiar with the client before this educational session.

This final question may be a bit variable, but I believe that knowing the serving size for each food item is extremely important. Lack of knowledge in this area has led to the dramatic rise in obesity.

2. **What is the difference between a DRI and an RDA? Should you tell your client to take both? Does it mean that everyone should take the same amount to achieve the same benefit from the nutrient? Are there DRI and RDA for macronutrients?**

Answer: DRI stands for Dietary Reference Intakes and RDA stands for Recommended Dietary Allowance. The RDA has been around for quite a long time (since the 1940s) and was originally established for the military to prevent scurvy. Since that time, significant study has been undertaken on each micronutrient and macronutrient to establish the level of intake that is deemed appropriate for 98 percent of the population to prevent disease and optimize health. Generally, every 10 years new RDA research is published and changes are made if needed. RDA is used to evaluate diets of populations.

DRI, which include the RDA, are relatively new and reflect collaborative work between the United States and Canada. They are a set of standards resulting from collaboration of many research scientists and can be used to evaluate the diets of healthy individuals. They include the Estimated Average Requirements from which RDA are derived; Adequate Intakes for nutrients, for which RDAs have not been established; and Tolerable Upper Intake Levels, which identify potentially toxic levels of intake.

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Case Study[2]

Sarah T. is a 20-year-old college student who is ovo-vegetarian. She is 5 feet 7 inches tall, weighs 140 pounds, and is physically active most days, riding her bike to and from her apartment off campus. Sarah's mother is concerned she is not getting the nutrients she needs to support her health and energy needs. Her usual daily diet includes toast or cereal with soy milk for breakfast, peanut butter sandwich for lunch, and pasta or vegetable pizza for dinner. She snacks frequently on chips or cookies and drinks one or two diet pops each day.

1. Using information from the book's appendices, what key nutrients are likely to be inadequate in Sarah's diet?
2. What additions to her diet would you recommend to increase her intake of these key nutrients?
3. What food-planning tool would be useful to help Sarah select a diet that provides all the necessary nutrients for her growth and development?
4. Using information from this chapter, estimate Sarah's daily Calorie needs and recommended daily amounts of foods that she needs from each food group. Include discretionary Calories.
5. What key concept does Sarah need to remember when selecting reasonable alternatives to milk?
6. Write a sample one-day meal plan for Sarah that provides meals and snacks that meet her nutrient needs.

Answers:

1. Protein, iron, zinc, calcium, vitamin B_{12}, vitamin D, and omega-3 fatty acids.
2. Add dark green leafy vegetables (iron and calcium) and whole-grain or fortified bread and cereal (protein, iron, zinc); snack on dried fruit and nuts or seeds (iron, calcium); use flaxseed, walnuts, and soybeans or their oils (omega-3).
3. Eating Well with Canada's Food Guide with tips for planning a vegetarian diet.
4. Estimated daily Calorie needs (Table 2–3, page 48): 2,400. Recommended daily amounts for 2,400 Cal: 2 cups fruit, 3 cups vegetables, 240 grams grains, 195 grams meat and alternatives, 3 cups milk and alternatives, 6 teaspoons oil. Discretionary Calories: 362.
5. Choose products that provide similar nutrients to milk, i.e., those that are fortified with calcium, vitamin D, and vitamin B_{12}.
6. Answers will vary. Breakfast: whole-grain cereal with soy milk and fresh fruit. Lunch: whole-grain bread with peanut butter and banana, soy milk. Snack: walnuts and raisins. Dinner: scrambled egg with grilled spinach and other vegetables. Snack: soy yogurt.

[2] Contributed by Barbara Quinn.

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Handout 2–1

Dietary Reference Intakes (DRI)

RDA (Recommended Dietary Allowance): the intake that meets the nutrient need of almost all individuals (97–98%) in a group.

AI (Adequate Intake): the observed or experimentally derived intake by a defined population group that appears to sustain health—used when an RDA cannot be determined.

UL (Tolerable Upper Intake Level): the highest level of nutrient intake likely to result in no additional risk of adverse health effects for nearly all individuals in the group.

EAR (Estimated Average Requirement): the intake that meets the estimated nutrient need of half the individuals in a group.

AMDR (Acceptable Macronutrient Distribution Ranges): values for carbohydrate, fat, and protein expressed as percentages of total daily Caloric intake.

Note: Dietary Reference Intakes are expressed as intakes per day, but they are meant to represent intakes averaged over time.

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Handout 2–2

Compare Your Food Intake to Canada's Food Guide

List food item and amount.

Food Item	Grain Products	Vegetables and Fruits	Milk Products	Meat and Alternatives
Breakfast:				
Snack:				
Lunch:				
Snack:				
Dinner:				
Snack:				
Total:				

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Handout 2–3

Guessing Portion Sizes—How Well Can You Do It?

1. Your instructor will set up food at stations around the classroom. You will be told what the food is but you will not be provided with the size or Calories of the food shown.

2. You will be asked to estimate the size of the portions of food that you see at each station. There will be a card at each station that will specify the unit of measurement, such as millilitres (mL) for a fluid or grams (g) for weight.

3. Estimate the portion on your own to the best of your abilities. Fill in the Estimated Size column of the table.

4. Take a guess at the number of Calories for the food at each station as well. Record this in the Estimated Calories column of the table.

5. Your instructor can supply the actual size and Calories for you to copy onto your table.

6. Answer the following questions based on your individual findings. Your answers do not need to be lengthy. Attach your answers to your filled-in table. You may be asked to hand in your answers in written form or your instructor may have you discuss your findings as a group.

Questions to Consider:

1. How did you decide on a portion size?

2. What type of visual aids in your everyday life may help you to estimate the portion size?

3. Did you more often overestimate or underestimate the portion sizes?

4. Which types of food did you overestimate? Which ones did you underestimate?

5. Did you have more difficulty measuring liquid or solid portions?

6. Give an example of how your ability to estimate food portions affects your diet.

7. What type of foods do you have difficulty estimating in your own diet? Why?

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Food Item	Estimated Size	Actual Size	Estimated Calories	Actual Calories

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Handout 2–4

Homemade or On-the-Go?

Do you have any idea how many Calories are in a homemade hamburger versus a hamburger from a fast-food joint? Fast-food restaurants have websites that describe the nutritional content of their popular meals or sides. The following table contains the list for common fast-food establishments and their websites.

Name	**Website URL**
Arby's	http://www.arbys.ca
Burger King	http://www.burgerking.ca
McDonald's	http://www.mcdonalds.ca
Pizza Hut	http://www.pizzahut.ca
Subway	http://www.subway.ca
Taco Bell	http://www.tacobell.ca
Wendy's	http://www.wendys.ca
Kentucky Fried Chicken	http://www.kfc.ca

You can also use Health Canada's "Nutrient Value of Some Common Foods" at http://www.hc-sc.gc.ca/fn-an/nutrition/fiche-nutri-data/nutrient_value-valeurs_nutritives-tc-tm-eng.php to find the nutritional content of most foods that you can prepare at home. This file also lists many kinds of frozen, prepared foods that can be heated up at home, as well as fast foods.

Food	Source of Food	Total Calories	Total Fat (g)	Total Carbohydrate (g)

You can fill out the table to compare foods to each other for Calorie, fat, or carbohydrate content. You can also compare the protein, vitamin, or mineral content of foods.

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WHAT OTHER RESOURCES ARE AVAILABLE?

You can look up information on Canada's Food Guide as well as other topics related to DRI and labelling. Consult the following websites to get reliable information on these topics:

- For more information on Canada's Food Guide, visit http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index-eng.php.
- Check out Health Canada's website for advisories, warnings, and recalls at http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/index_e.html.
- For more information on nutrition labelling, go to http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/index-eng.php.
- For information on food labelling and advertising, go to the Canadian Food Inspection Agency Guide to Food Labelling and Advertising at http://www.inspection.gc.ca/english/fssa/labeti/guide/toce.shtml.
- To learn more about how to help people with diabetes choose the right food and portions to help them manage their blood glucose and maintain a healthy weight, go to the website for the Canadian Diabetes Association, http://www.diabetes.ca, and enter the search term "carbohydrate counting."
- To learn more about how to assess your own diet with an online assessment tool, eaTracker, visit http://www.eatracker.ca/default.aspx.
- For more information on phytochemicals, visit the Natural Health Products Directorate (for nutraceuticals) at http://www.healthcanada.gc.ca/nhpd.

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