



Preface

We think of ourselves as consumers when we purchase homes, cars, computers, and food. We are also consumers of nutrition-related information. Nearly every day, we are bombarded with media messages concerning nutrition, foods, and health. Much of this information is unreliable and designed to promote sales of products or services. Nevertheless, we may use the information when making decisions about which foods or nutrition-related products to buy. Why? Many consumers lack the knowledge and skills needed to analyze such information critically and decide whether to apply it to their decision-making process.

Helping students become better informed consumers, particularly in the areas of food and nutrition, is the foundation of *Nutrition for Healthy Living, Canadian Edition*. This major theme flows throughout the textbook by providing students with practical information, critical-thinking skills, and the scientific foundation needed to make more informed choices about their diet and health. By reading *Nutrition for Healthy Living, Canadian Edition*, students not only will learn basic principles of nutrition but will also be able to evaluate various sources of nutrition information critically and apply sound nutrition practices to improve their lives.

Who Is This Book Written For?

Nutrition for Healthy Living, Canadian Edition, is intended for students who are interested in learning about nutrition for personal reasons, as well as for students considering majoring in nutrition, nursing, or other health- and science-related fields. Students from a wide variety of academic backgrounds often enroll in introductory nutrition courses, and in many instances, they have not taken university-level science courses prior to this course. With this in mind, *Nutrition for Healthy Living, Canadian Edition*, was written with the understanding that an introductory textbook must appeal to students who represent a broad range of interests and academic backgrounds—from English majors to nursing majors. An introductory course, along with this textbook, can spark students' interest in adopting healthier dietary practices and possibly even inspire them to consider nutrition as a major.

The *Nutrition for Healthy Living* Difference Is ABC

This text was written as an alternative to established nutrition textbooks, while maintaining a focus on concepts that are fundamental to introductory nutrition courses. It was our vision to create a textbook that would be fun to read, engage students' interest, be well organized, and have features that contribute to the pedagogy without being distracting. We gathered feedback from numerous instructors, and the advantages that the new textbook would offer took shape—what we refer to as the “ABCs of *Nutrition for Healthy Living*.”

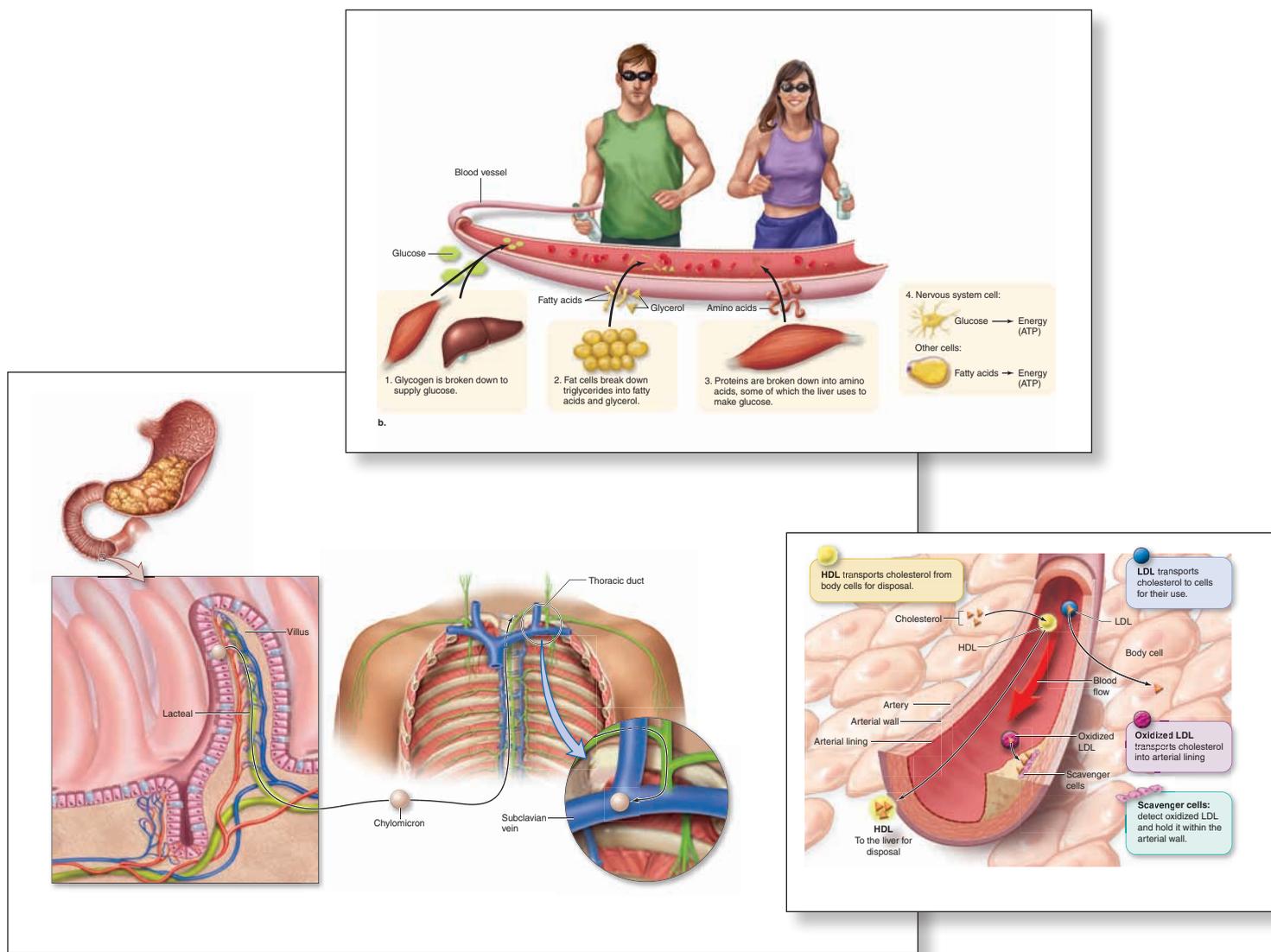
A = Accessible Science

Nutrition is an “offspring” science that requires a basic understanding of certain chemical and physiological concepts, terms, and scientific principles. Ignorance about chemistry and physiology contributes to food faddism and health quackery. By providing a solid scientific foundation, nutrition educators can more easily dispel commonly held but inaccurate beliefs, such as “When you’re inactive, muscle turns into fat,” and “Cellulite is a special type of body fat.”

Becoming knowledgeable about nutrition requires a certain level of understanding of important scientific principles. *Nutrition for Healthy Living*, Canadian Edition, recognizes the importance of introducing such principles in a manner that every college and university student can understand.

The primary goal for students who use this textbook is the same as it is for the introductory nutrition courses we teach—to aim for students to complete the course with a basic understanding of nutritional science so that they can make intelligent, practical choices that can result in improved nutrition and health.

Chapter 4 (Body Basics) presents basic principles of chemistry and human physiology as they apply to the study of nutrition at a level students can easily understand. This chapter introduces and defines terms that relate to nutrition and foods such as *acid*, *basic*, *enzyme*, and *solvent*. Students and courses vary in the depth of scientific foundation required; therefore, this chapter features some flexibility. The chapter is divided into two main sections, chemistry and human physiology, so professors can choose to skip the chemistry section if they prefer.



B = Brief Organization



In developing the structure of this book, a new approach emerged; instructors often do not have the time to cover all the material in their textbooks. Based upon their feedback, the core content was organized into 13 chapters. This organization makes teaching introductory nutrition more manageable and fits the time frame of most courses better than textbooks that include 15 or more chapters. Some topics were important to cover, but they did not warrant a full chapter. Thus, topics such as global nutrition concerns, alcohol and alcohol abuse, and eating disorders are presented in a “Highlight” feature at the end of chapters. Chapter 13 is devoted entirely to nutrition during the life cycle. Furthermore, key aspects of world nutrition and life-cycle nutrition are also incorporated into relevant chapters throughout the book.

Nutrition for Healthy Living, Canadian Edition, covers the core material that instructors need in a format that is logical and practical for nearly all introductory nutrition courses:

- Chapter 1 introduces students to nutrition and nutrients and presents key nutrition concepts, such as “Most naturally occurring foods are mixtures of nutrients,” and “Eating a variety of foods can help ensure the nutritional adequacy of a diet.” There is a new section on the Canadian Healthy Living Strategy, information on how Canadians’ eating habits have changed in the past two generations, and data concerning undernutrition in Canada, along with some of the obstacles that hinder the ability of Canadian families to select nutritionally adequate diets.
- Chapter 2 presents basic information about scientific methodology as it relates to nutrition research and provides tips for becoming a more wary consumer of nutrition- and health-related information. Tips and Web links for Canadian organizations will help students to find reliable health and nutrition information on the Internet, along with information on becoming an accredited dietician in Canada.
- Chapter 3 provides a brief history of Canadian food guides, as well as an introduction to the current *Eating Well with Canada’s Food Guide*; discussion of the four major food groups; and age- and gender-specific dietary guidelines for Canadians. This chapter discusses dietary standards and guidelines, food groups and guides, and how to use information provided on nutrient labels. Chapter 3 also introduces the EATracker tool, developed by Dietitians of Canada, which allows individuals to track their daily food and activity choices and compare them to guidelines set forth by Health Canada.
- Chapter 4 introduces basic chemical and physiological concepts and key terms that relate to the science of nutrition.
- Chapters 5, 6, 7, 8, and 9 present basic and practical information about nutrients, such as their major functions in the body, food sources, and roles in health, along with mention of the Canadian Diabetes Association (CDA) in a discussion about diabetes, and a Web link provided for students to access the diabetes risk checklist on the CDA’s Web site. Discussions

Chapter 1 Highlight
Malnutrition: A Worldwide Concern

Malnutrition is a state of health that results from improper nourishment. Chronic undernutrition occurs when long-term energy and nutrient intakes are insufficient to meet an individual’s needs. Hence, the physiological need for food, usually accompanied by undernutrition. In undernourished children, nutrient deficiencies are responsible for stunted physical growth, delayed physical development, blindness, impaired intellectual development, and premature death.

Throughout the world, social, environmental, economic, and political factors contribute to undernutrition (Fig. 1.1A). Undernutrition is a serious problem particularly in sub-Saharan Africa and certain regions of Asia where decades of civil unrest, war, political corruption, and the AIDS epidemic have left millions of people impoverished and living in uncertainty. Many developing nations in these regions use large sums of money to wealthy countries. Having high debt often causes government leaders to reduce or eliminate basic services, including health care and education programs. Furthermore, undernutrition is common among impoverished people in developing countries where food production and supplies are inadequate. In addition, developing nations often divert much of the food they produce to global markets rather than domestically to feed the nation’s citizens. Although people often associate malnutrition with undernutrition and starvation, overnutrition, the long-term excess of energy or nutrient intake, is also a form of malnutrition. Overnutrition is often characterized by excess body fat and obesity. Obesity is an epidemic in countries where most people have the financial means to buy food, have an ample food supply, and lead physically inactive lives. This highlight focuses on undernutrition. Chapter 7 discusses protein-energy malnutrition in detail. Chapter 9 provides information about the obesity epidemic.

Undernutrition
The current worldwide population is estimated to be more than 6.3 billion people. Throughout the world, an estimated 500 million children were born between 1979 and 2005. If the present rate of population growth does not slow, an estimated 1 billion people will be living on Earth in 2050.¹ Most of the explosive population growth is occurring in developing countries where economic growth is unable to keep pace with the rapidly increasing number of people. As a result, poverty and undernutrition are commonplace in these countries. Additionally, regional food shortages can result from traditional dietary practices, crop failures, local war, and political instability and corruption. According to the World Health Organization (WHO), nearly one in three people worldwide is chronically undernourished.² Each day, about 24,000 children in the world die of hunger. The rate of mortality of child deaths occurs among the poor in developing countries, particularly in Africa and Asia.³ Impoverished people tend also to cope with infectious diseases, parasitic infestations, overcrowded and unsanitary housing conditions, and polluted water supplies. Chronic undernutrition depresses the body’s immune functioning, increasing the risk of death from infectious diseases, such as measles, especially in childhood. In developing countries, poor sanitation practices and lack of clean cooking and drinking water cause the majority of all diseases and more than one-third of all deaths (Fig. 1.1B).

Undernutrition during Pregnancy
Undernutrition can be particularly harmful when it occurs during periods of rapid growth such as pregnancy, infancy, and childhood. Women who are undernourished during pregnancy have high risk of giving birth to infants who are born too soon. These babies often have low birth weights and suffer from breathing problems.

Figure 1.1A Factors that contribute to undernutrition. Many factors, including war, disease, and overpopulation, contribute to undernutrition in developing countries.

Figure 1.1B Poor sanitation. In developing countries, poor sanitation practices and lack of clean cooking and drinking water contribute to the spread of disease.

Chapter 2 Highlight
Have You Considered Becoming a Dietitian?

Are you interested in science? Would you like to learn how diets can be altered to treat disease? Would you like a challenging career as a health professional? If you answered “yes” to each of these questions, you may want to consider becoming a registered dietitian (RD). There are three major professional divisions for registered dietitians—clinical dietetics, community nutrition, and food service systems management. Clinical dietitians can work as members of medical teams in hospitals or clinics. Registered dietitians can also work as community nutritionists in public health settings or as dietary consultants in private practice or with wellness programs. Food service systems management dietitians direct food systems in hospitals, schools, or other settings. Although most registered dietitians work in health care settings, some are educators or researchers.

include Health Canada’s labelling regulations for trans fat in manufactured foods, recommendations for lipid intake, recommendations for protein intake based on *Eating Well with Canada’s Food Guide*, and expanded coverage of vitamin D deficiency, with recommendations from the Canadian Paediatric Society and Health Canada for vitamin D consumption.

- Chapters 10, 11, 12, and 13 focus on applying basic nutrition information for special needs and important concerns. Chapter 10 covers weight management; Chapter 12 features information about food-borne illness and information about Health Canada’s legislation on food additives; Chapter 13 covers daily food plans based on *Eating Well with Canada’s Food Guide* for each major life stage, including pregnant and lactating women.

Nutrition for Healthy Living, Canadian Edition, follows a more traditional approach to the study of nutrition in that the textbook’s organization focuses on nutrients rather than certain tissues or diseases. Additionally, the textbook integrates health information within each chapter where it is appropriate, rather than relegating it to a single chapter at the end of the textbook. For example, the chapters that discuss nutrients provide fundamental information first and then present applications, including the nutrient-related health effects of certain lifestyle practices, particularly dietary choices. Additionally, the quantity and length of boxed features in the chapters are limited, as they tend to disrupt the flow of content and students often skip reading them.



C = Consumer Focus

Regardless of their background, students are consumers of nutrition information from a wide variety of sources, including popular magazines, diet books, infomercials, and the Internet. Often, these students arrive in class with many misconceptions about diet and health. As nutrition educators, we seek to identify these beliefs and to impart sound, reliable nutrition and health information. We also strive to equip our students with the tools they need to make intelligent, informed food and nutrition-related decisions beyond the classroom. Chapter 2 (Evaluating Nutrition Information) presents a practical introduction to becoming an informed consumer of nutrition and nutrition-related information. This unique chapter provides basic information concerning scientific research and a thorough discussion of how to evaluate nutrition- and health-related sources and messages. The consumer emphasis is also integrated into the narrative and in pedagogical tools throughout the text.

In addition to devoting an entire chapter to the topic of evaluating nutrition-related information and ways of becoming a more wary consumer of nutrition information, the consumer emphasis is integrated throughout the book.



Food & Nutrition

tip

Gelatin is an animal protein that dissolves in boiled water. As it cools, gelatin holds the water and thickens, forming a gel, a solution that takes the shape of its container. Pineapple, papaya, kiwifruit, and guava naturally contain enzymes that break down gelatin. Therefore, when using gelatin in recipes, don't add fresh or frozen forms of these fruits, because the enzymes will break down gelatin and the mixture won't gel. Heating destroys these enzymes, thus you can make a moulded gelatin salad or dessert that contains canned pineapple. (Foods undergo heating during the canning process.)

- **Food & Nutrition Tips:** Interspersed throughout the chapters, these tip boxes present practical suggestions that apply to chapter content and provide students with information they can use every day. Examples include tips for adding calcium to your diet, staying hydrated, and keeping foods safe to eat.

REAL people

REAL stories

Dallas C.

Dallas C. is an energetic teenager who loves mountain bike and road bike racing, downhill skiing, wrestling, and climbing ropes and trees. Not only is he athletic, he is also smart—his marks place him at the top of his class. According to his proud parents, Dallas is the perfect son—“a nice boy.” Dallas is a special young man, but he also needs a special diet. Dallas was born with phenylketonuria (PKU).

A few days after birth, Dallas underwent standard newborn blood testing. The results of the test indicated that the level of phenylalanine in his blood was about 40 times higher than the normal amount, a sign of the inherited disorder PKU. To avoid developing severe brain damage and other physiological effects of PKU, the infant needed to receive the care of a physician who specializes in treating children with the disorder. The primary treatment for PKU is a low-phenylalanine diet.

Most foods that are rich sources of protein, especially high-quality animal proteins, contain more phenylalanine than people with PKU can tolerate. Thus, from the time Dallas was a week old, he has consumed a formula that does not contain the amino acid. In addition to the formula, Dallas eats special foods that resemble “regular” foods but are not available in supermarkets. To obtain low-phenylalanine foods, his parents order them from companies that manufacture such products. Dallas can eat limited amounts of grain products and most fruits and vegetables. To determine whether the diet is working, Dallas must have the level of phenylalanine in his blood checked weekly.

Dallas' parents and his two younger sisters do not have PKU. At home, he eats the low-phenylalanine foods, while the other members of his family consume regular foods. Foods that are eaten away from home can present problems for people with PKU. In Dallas' case, his mother provides his school with a supply of low-phenylalanine foods for the teen's lunches. When the family visits restaurants, Dallas usually orders french fries, which are allowed in his diet. Dallas is so accustomed to his special diet that he thinks meat looks “gross.”

In the past, children with PKU were often allowed to eat regular foods after they were about 6 years of age. However, the importance of continuing the low-phenylalanine diet became evident when many of the children experienced learning and behavioural problems as they matured. Dallas is aware of the consequences that can occur if he does not limit his phenylalanine intake, and he accepts the need to follow the special diet for the rest of his life. According to Dallas, “Being on a strict diet has not only made me disciplined, it has taught me to do whatever is needed to always take good care of myself. I have learned that we are all different, anyway. So, accept who you are!”

- **Real People, Real Stories:** Appearing in Chapters 4, 5, 7, and 9, these features narrate real-life cases about people who have recovered from or who are currently living with nutrition-related conditions. These stories will help students recognize the challenges of living with such conditions and the roles that diet and physical activity play in managing health.

REAL people

REAL stories

Lisa G.

Late in 1999, Lisa G. began experiencing painful abdominal cramps followed by frequent bouts of diarrhea. It seemed that whatever she ate would pass through her digestive tract and be eliminated quickly. When over-the-counter diarrhea remedies didn't work, Lisa sensed her ailment was not a self-limiting intestinal tract infection. Before the illness struck, Lisa weighed 57 kg (125 lbs.)—a healthy weight for a person who is 157 cm (5'2"). She was physically active and strong. Four weeks after developing the digestive tract problems, she had lost about 5.5 kg (12 lbs.) and become noticeably weaker.

Lisa's physician suspected a form of inflammatory bowel disease (IBD) was responsible for her condition. She was admitted into a local hospital and treated with prednisone, a steroid medication that helps reduce inflammation. When her weight stabilized, her physician prescribed additional medications that are specific for treating IBD. Her special diet included foods that were easily digested. She soon learned which foods she could eat without suffering from diarrhea. For example, she couldn't eat raw carrots, but she could tolerate cooked carrots. Because IBD damaged the ileum, the site for vitamin B-12 absorption, Lisa had to have injections of vitamin B-12 regularly. Within a few weeks, Lisa was well enough to leave the hospital, but she remained on the medication.



- Recipes for Healthy Living:** This practical application of nutrition and food information will appeal to most college and university students. Each chapter includes at least one easy-to-make, kitchen-tested recipe. Each recipe presents information about the energy and key nutrients per serving, as well as a pie chart displaying the percentages of energy

provided by the meal from carbohydrate, protein, and fat. This feature demonstrates that preparing nutritious foods can be fun and economical. By trying the recipes, students can develop basic food preparation skills and may be inspired to cook more foods “from scratch.” As a result, they may rely less on vending machines and fast-food outlets.



Recipes for Healthy Living

Trendy Black Beans

You've probably eaten ordinary canned baked beans as an accompaniment to hot dogs and hamburgers. If you're interested in eating a more trendy kind of bean, try this recipe for black beans. Although canned black beans are more convenient to use in recipes than dried black beans, the canned products generally contain a lot of salt.

This black bean recipe makes about four ½-cup servings. Each serving supplies approximately 120 kcal, 8 g protein, less than 1 g fat, 7.5 g fibre, 2 mg iron, 340 mg potassium, 70 mg sodium, and 130 mcg folate (a B vitamin). To make the beans a complementary protein source, serve them wrapped in a soft burrito or on cooked rice.

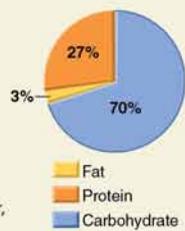
INGREDIENTS:

- 1 cup dried black beans
- ¼ cup coarsely chopped green pepper
- ¼ cup peeled, chopped yellow onion
- 1 large clove garlic, peeled and minced
- ½ tsp ground black pepper
- ½ tsp salt
- 3–5 drops hot pepper sauce (optional)

PREPARATION STEPS:

1. Rinse dried beans in cold water, draining excess water.
2. Place the beans in a saucepan and add 1¾ cups of water.
3. Heat beans and water on high heat until mixture boils. Boil for 2 minutes, then turn off heat, and remove saucepan from the burner. Cover saucepan and allow beans to remain in the hot water for 1 hour. While beans are soaking, prepare green pepper, onion, and garlic.
4. Do not drain water from beans. Simmer beans on low heat, in the covered saucepan, for 45 minutes. Stir occasionally.
5. Add green pepper, onion, garlic, black pepper, and salt. Simmer for an additional 15 minutes.
6. Serve hot. Cooked beans can be frozen.





■ Fat
■ Protein
■ Carbohydrate

Hummus

Hummus may have originated in the Middle East, but it's become popular in this country as a dip for vegetables or bread. Hummus is a good source of protein, monounsaturated fat, fibre, the minerals potassium and iron, and the B vitamin folate. This hummus recipe makes about eight ¼-cup servings. If you don't have a blender, you can mash the chickpeas and garlic with a fork before you add the other ingredients. To make hummus a complementary protein source, serve it with whole-grain crackers, tortilla chips, or pita bread. Each serving (with no added salt) supplies about 130 kcal, 3 g protein, 8 g fat, 3 g fibre, 0.8 mg iron, 120 mg potassium, 4 mg sodium, and 70 mcg folate.

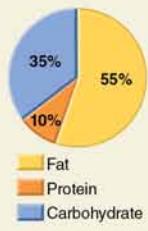
INGREDIENTS:

- 2 cups unsalted, cooked garbanzo beans (chickpeas)
- 1 Tbsp lemon juice
- 1 medium clove garlic, peeled
- ¼ cup cold water
- ¼ cup olive oil pinch salt and paprika (optional)

PREPARATION STEPS:

1. Drain beans. Place the beans, lemon juice, garlic clove, oil, and water in a blender. Blend until the mixture is smooth.
2. Serve in a bowl. If desired, sprinkle paprika on top of hummus.





■ Fat
■ Protein
■ Carbohydrate

Did You Know? 

Using “high colonics” and other types of enemas to “cleanse” your large intestine isn't necessary because the colon doesn't need to be cleansed. Furthermore, frequent enemas may deplete the body of vital minerals, including sodium and potassium. Check with your physician before trying enema treatments.

Did You Know? 

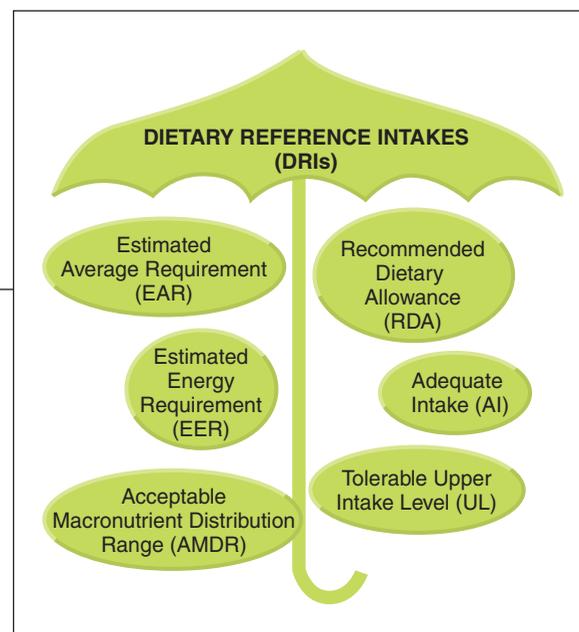
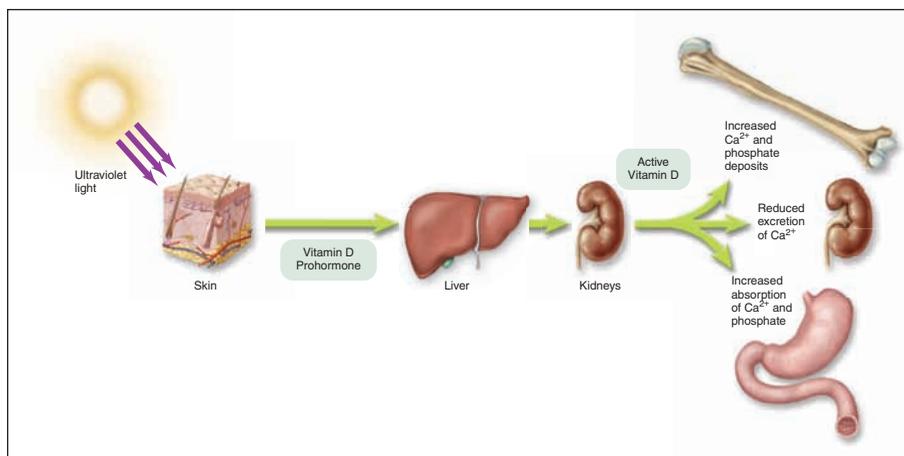
Despite information provided in commercials or advertisements, you cannot “feed” your hair, nails, or skin by using shampoos, conditioners, or lotions containing proteins or other nutrients. Hair, nails, and the outermost layer of skin are not living. By eating a nutritious diet, you'll provide your body with the nutrients it needs to make healthy hair, nails, and skin.

- Did You Know?** These brief boxes relay interesting nutrition-related tidbits that relate to information presented in the text. A number of “Did You Know?” boxes present facts that dispel common misconceptions about food and nutrition.

Readability and Style for Today's Student

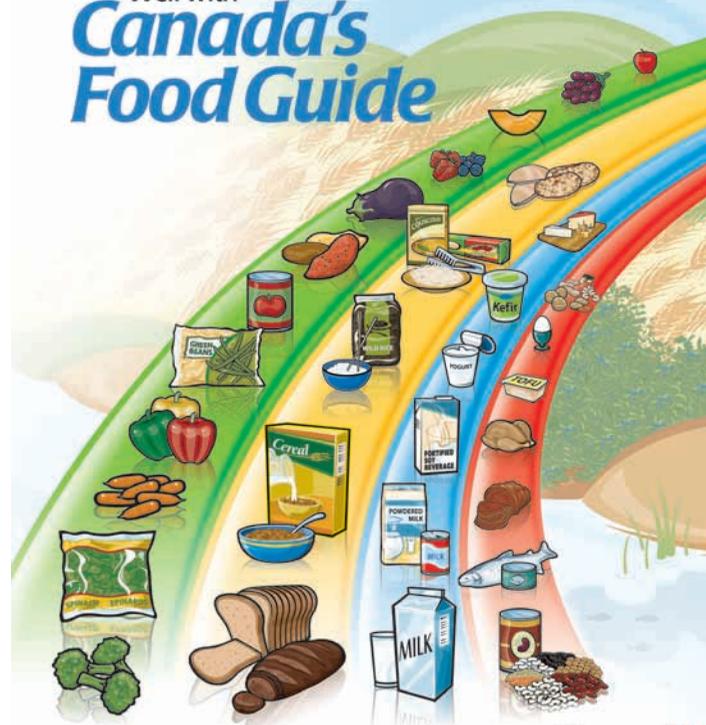
A key pedagogical element of any college or university textbook is readability. As each chapter was written, priority was given to maintaining a balance between having a clear, technically accurate narrative and an engaging, easy-to-read writing style. Examples that students can relate to were carefully chosen, and tools are provided for applying healthy nutritional practices to their own lives. Additionally, to ensure accuracy, the content has been extensively researched with in-text citations and references listed in Appendix E.

Another way the McGraw-Hill Ryerson editorial team and the authors sought to appeal to today's students is by creating beautiful, pedagogically based illustrations and creative page layouts. Keeping in mind that many students are visual learners, we selected vibrant photos and rendered illustrations that are visually appealing as well as instructional, for a deliciously beautiful book. It is important to note the use of products in photos are for example representation only and do not constitute an endorsement.



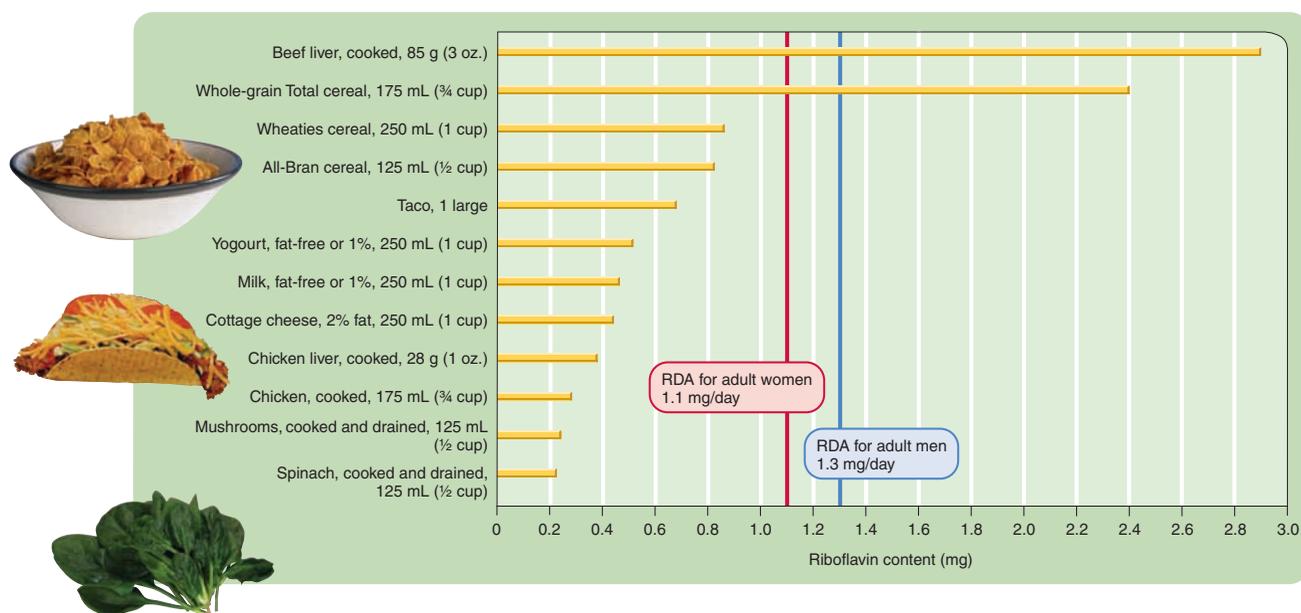


Eating Well with Canada's Food Guide



Canada

Vegetables and Fruit	Grain Products	Milk and Alternatives	Meat and Alternatives
Spinach Squash Potatoes Tomatoes Lettuce Lima beans	Whole-wheat bread Whole-grain products	Milk Yogourt Cottage cheese Ricotta cheese	Meat Chicken Fish Shrimp Beans
Pears Prunes Peaches Avocados Cantaloupes Bananas			





Assessing and Evaluating Student Progress



Chapter Learning Outcomes

After reading Chapter 1, you should be able to:

1. Define the terms diet, nutrition, nutrient, essential nutrient, macronutrient, micronutrient, kilocalorie, and phytochemical.
2. Identify factors that influence personal food choices.
3. Identify lifestyle factors that contribute to the leading causes of death in Canada.
4. List the six classes of nutrients and identify a major role of each class of nutrient in the body.
5. Identify basic units of the metric system often used in nutrition.
6. Explain the concept of energy density and identify energy dense foods.
7. Use the caloric values of energy-yielding nutrients to estimate the amount of energy (kcal) in a food.
8. Identify key basic nutrition concepts, such as the importance of eating a variety of foods and that no food supplies all nutrients.

One of our primary goals as nutrition educators is to ensure that our students leave their introductory nutrition course with a better understanding of the nutrition principles and concepts needed to improve their diet and health. In order to assess how well faculty are achieving that goal, many colleges and universities are implementing Student Learning Outcomes as a way to measure what students have learned upon completing an introductory nutrition course. Student Learning Outcomes can also be used to help instructors identify content areas that need more refined teaching methods. *Nutrition for Healthy Living*, Canadian Edition, has been developed around the following course-wide outcomes.

Student Learning Outcomes

1. Identify functions and sources of nutrients.
2. Demonstrate basic knowledge of digestion, absorption, and metabolism.
3. Apply current dietary guidelines and nutrition recommendations.
4. Analyze and evaluate nutrition information scientifically.
5. Relate the roles of nutrients in good health, optimal fitness, and chronic diseases.
6. Summarize basic concepts of nutrition throughout the lifespan.
7. Evaluate a personal diet record using a computer database.

Additionally, each chapter is structured around five to ten Chapter Learning Outcomes. Listed on the chapter-opening pages, these Chapter Learning Outcomes can help students focus their studying and guide instructors with their teaching and assessment. The Chapter Learning Outcomes help students prepare for reading the chapter and also clarify major concepts they are expected to learn. These measurable outcomes are further supported by assessment methods and study aids found within the chapters.

Quiz YOURSELF

Take the following quiz to test your basic nutrition knowledge; the answers are on page 27.



1. There are four classes of nutrients: proteins, lipids, sugars, and vitamins. _____ T _____ F
2. Proteins are the most essential class of nutrients. _____ T _____ F
3. All nutrients must be supplied by the diet, because they cannot be made by the body. _____ T _____ F
4. Vitamins are a source of energy. _____ T _____ F
5. Milk, carrots, and bananas are examples of "perfect" foods that contain all nutrients. _____ T _____ F

- **Quiz Yourself:** This pre-test is comprised of five true-or-false questions, which appear at the beginning of each chapter and serve to stimulate readers in the subsequent content; answers to the quiz are provided on the last page of the chapter. By taking the quiz, students may be surprised to learn how little or how much they know about the chapter's contents.



CRITICAL THINKING

1. Identify at least six factors that influence your food selections. Which of these factors is the most important? Explain why.
2. Consider your current eating habits. Explain why you think your diet is nutritionally adequate or not.
3. "Everything in moderation." Explain what this statement means in terms of diet.
4. If you are at risk of developing a chronic health condition that could be prevented by changing your diet, would you make the necessary changes? Explain why or why not.
5. Have you ever used food to treat or prevent illnesses? If you have, describe the situations and discuss which foods were used.
6. What actions have you taken or can you take to help hungry or food-insecure people obtain adequate nutrition?

- **Critical Thinking:** "Critical Thinking" involves higher-level cognitive skills, including applying, analyzing, synthesizing, and evaluating information. This assessment features a series of thought-provoking questions at the end of the chapter. The questions can help students develop higher-level cognitive skills using nutrition-related content. Acquiring and/or sharpening these skills can help students become better consumers of nutrition-related information.

- **Concept Checkpoint:** At the end of each major section of a chapter, Concept Checkpoints pose two to ten review questions, many of which involve critical-thinking skills. Students can access the answers to these questions within *Connect* at www.mcgrawhillconnect.ca.



Concept Checkpoint

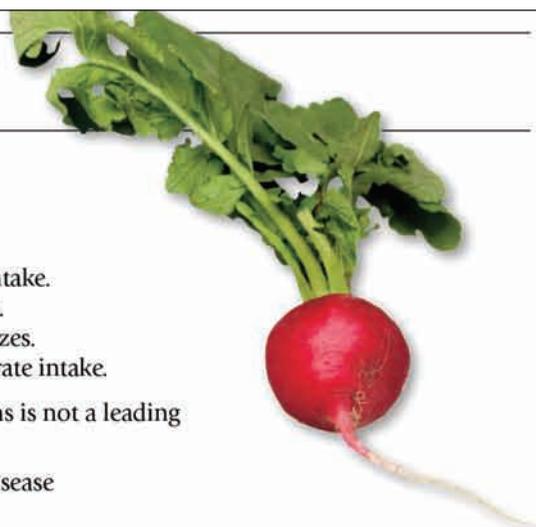
1. Identify at least three of the ten leading causes of death that are diet related.
2. List the six major classes of nutrients.
3. What is the smallest functional structural unit in the body?
4. What are three key factors that determine whether a substance is an essential nutrient?
5. What is a phytochemical?
6. Define dietary supplement.
7. Which Canadian agency regulates drug and dietary supplement manufacturers?
8. Identify at least four factors that influence your eating habits.

PRACTICE TEST

Select the best answer.

1. Diet is a
 - a. practice of restricting energy intake.
 - b. typical pattern of food choices.
 - c. method of reducing portion sizes.
 - d. technique to reduce carbohydrate intake.
2. Which of the following conditions is not a leading cause of death in Canada?

a. tuberculosis	c. heart disease
b. cancer	d. stroke
3. The nutrients that provide energy are
 - a. carbohydrates, vitamins, and lipids.
 - b. lipids, proteins, and minerals.
 - c. vitamins, minerals, and proteins.
 - d. proteins, fats, and carbohydrates.



- **Practice Test:** Each chapter ends with a series of ten or more multiple-choice questions that test students' comprehension and recall of information presented in the chapter. Students can access these same tests in an online format with automatic grading within *Connect* at www.mcgrawhillconnect.ca. The multiple-choice questions prepare students for classroom exams because they are similar in type and format to those provided in the test bank for *Nutrition for Healthy Living, Canadian Edition*. In many instances, the test questions are correlated to the course-wide Student Learning Outcomes and Chapter Learning Outcomes.

kilocalorie or **Calorie** heat energy needed to raise the temperature of 1 litre of water 1° Celsius; measure of food energy

macronutrients nutrients needed in gram amounts daily and that provide energy; carbohydrates, proteins, and fats

micronutrients vitamins and minerals

- **End-of-Chapter Content:** In addition to the aforementioned Practice Tests, the chapter is summarized with a brief recap of the chapter's main points.
- **References:** *Nutrition for Healthy Living*, Canadian Edition, includes in-text citations and extensive lists of references in Appendix E. References provide readers with access to sources of information for more in-depth understanding or for topics of particular interest.

Chapter 4

1. Saladin KS: *Anatomy & physiology* 4th ed. Boston: McGraw-Hill Publishing Company, 2007.
2. Seeley RR and others: *Essentials of anatomy & physiology* 6th ed. Boston: McGraw-Hill Publishing Company, 2007.
3. Widmaier E and others: *Vander's human physiology* 10th ed. Boston: McGraw-Hill Publishing Company, 2006.
4. Prescott LM and others: *Microbiology* 6th ed. Boston: McGraw-Hill Publishing Company, 2005.
5. Reid G and others: Potential uses of probiotics in clinical practice. *Clinical Microbiology Reviews* 16(4):658, 2003.
6. Adolfsson O and others: Yogurt and gut function. *American Journal of Clinical Nutrition* 80(2):245, 2004.

- **Personal Dietary Analysis:** Many chapters include an end-of-chapter activity for analyzing personal eating habits. Most of these activities require the use of a dietary analysis software program, such as McGraw-Hill Ryerson's NutritionCalc Plus. Students can gain insight into their eating behaviours by completing this activity.

- **Key Terms and Pronunciation Guide:** Key terms are indicated throughout the chapters using bold font, with definitions provided in the margins. Many terms also have pronunciations provided within the text where the term is first introduced. A full glossary of key terms is provided at the end of the book.



SUMMARY

Lifestyle choices, including poor eating habits and lack of physical activity, contribute to the development of leading causes of premature deaths for Canadian adults—heart disease, cancer, and stroke. You may be able to extend your lifespan and improve your quality of life by applying what you learn about nutrition and the role of diet and health.



Personal Dietary Analysis

1. Refer to the three-day food log from the Personal Dietary Analysis feature in Chapter 3. Calculate your average protein intake by adding the grams of protein eaten each day, dividing the total by three, and rounding the figure to the nearest whole number.

Sample Calculation:

Day 1 76 g

Day 2 55 g

Day 3 103 g

Total grams 234 g ÷ 3 days = **78** g of protein/day

Your Calculation:

Day 1 _____ g

Day 2 _____ g

Day 3 _____ g

Total grams _____ ÷ 3 days = _____ g/day

My average daily protein intake was _____ g.

2. The RDA for protein is based on body weight. Using the RDA of 0.8 g of protein/kg of body weight, calculate the amount of protein that you need to consume daily to meet the recommendation. To determine your body weight in kilograms, divide your weight (pounds) by 2.2, multiply this number by 0.8 to obtain your RDA for protein, and then round the figure to the nearest whole number.

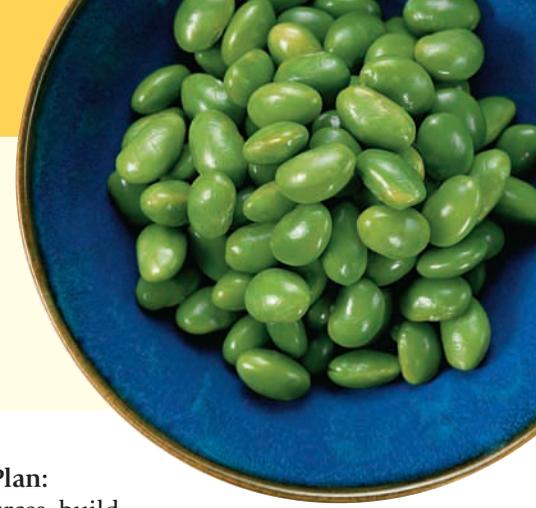
My weight in pounds _____ ÷ 2.2 = _____ kg

My weight in kg _____ × 0.8 = _____ g

My RDA for protein = _____ g

- a. Did your average intake of protein meet or exceed your RDA level that was calculated in step 1? _____ yes _____ no
- b. If your answer to 2a is "yes," which foods contributed the most to your protein intake?

Teaching and Learning Supplements



McGraw-Hill Ryerson *Connect*[™] (www.mcgrawhillconnect.ca) is an online teaching and learning platform developed and supported in Canada for Canadian institutions, their faculty, and students. *Connect* was inspired by multiple student and instructor research initiatives, including a quantitative usage and attitude study that captured insights from more than 1400 students across Canada.

Connect embraces diverse study behaviours and preferences with breakthrough features that help students master course content and achieve better results. The powerful course management tool in *Connect* also offers a wide range of exclusive features that help instructors spend less time managing and more time teaching.

For the Student

Connect features:

- **An Interactive and Searchable eBook:** Seamless view—includes digital tool box with highlighting and sticky note features.
- **Flexible Study Plan Options:** Self-assessment quizzes identify knowledge gaps and suggest study exercises and resources. Students can also access and customize content to create their own study plan within *Connect*.
- **Accessibility:** *Connect* with eBook is included with all new *Connect* textbooks at no extra charge.

Within *Connect*, students can access and/or add the following resources to their study plan:

- Practice multiple-choice and true/false quizzes
- Health- and nutrition-related Web links
- Animations illustrating nutrition and biological processes
- Answers to Concept Checkpoint and Practice Test questions from the textbook
- Bonus Appendices: Amino Acids, Vitamins Involved in Energy Metabolism, Body Mass Index-for-Age Percentiles

For the Instructor

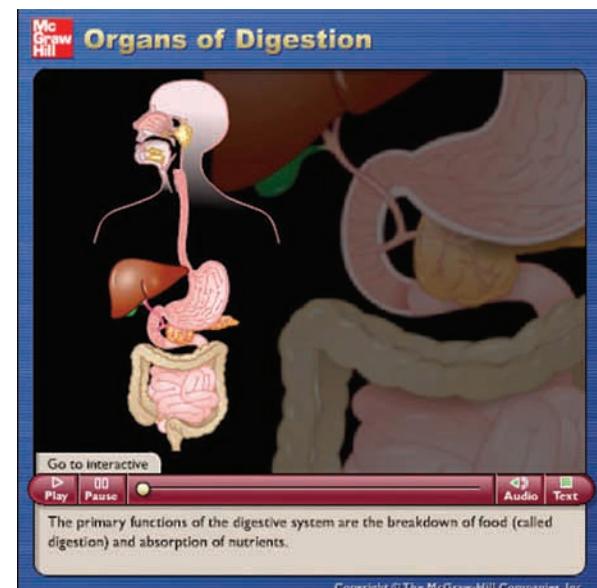
Connect features:

- **An Interactive and Searchable eBook:** Seamless view—includes digital tool box with highlighting and sticky note features.
- **A Step-by-Step Assignment Builder:** Instructors can easily create assignments with a range of questions, including end-of-chapter questions and Test Bank material.

- **A Personalized Teaching Plan:** Instructors can access resources, build their teaching plan, and share with associates all within *Connect*.
- **An At-a-Glance Grade Book:** Instructors can monitor student or group performance, and easily export grade reports into Blackboard, Desire2Learn, Moodle, and WebCT.
- **Turn-Key Instructor Set-Up:** Support programs are available to help instructors easily set up their course with ongoing support.

Within *Connect*, instructors can access, download, or add the following resources to their teaching plan:

- **Instructor's Manual:** The Instructor's Manual includes an Overview, detailed Chapter Outline, and various teaching ideas for each chapter.
- **Microsoft® PowerPoint® Presentations:** Detailed PowerPoint® slides begin with Learning Outcomes and present the key points for each chapter, integrating many of the illustrations and tables from the textbook.
- **Computerized Test Bank:** The Test Bank contains approximately 780 multiple-choice questions, each aligned with a Learning Outcome and page reference from the text. Test items are also available in Word format (rich text format). For secure online testing, exams created in EZ Test can be exported to WebCT and Blackboard.
- **Image Bank:** The Image Bank contains a digital copy of each photo, illustration, and table from the textbook. These jpeg files can be used to create customized lectures, visually enhance tests and quizzes, or design compelling course Web sites.



NutritionCalc Plus™

NutritionCalc Plus™ is a suite of powerful dietary self-assessment tools available on CD and online. This newest release features approximately 27 000 foods from the ESHA Research Nutrient Database and a new user-friendly interface that makes creating a

personal diet analysis even easier. Users now have the ability to add up to three profiles and to create their own recipes. The program functions are supported by detailed Help documents and helpful cautionary notes that warn the user of possible entry errors.

Please contact your *i*Learning Sales Specialist for more information.

NutritionCalc Plus 3.0
McGraw Hill Higher Education

home Logout help

Profile: Chris Fittenwell

Profiles Intakes Activities Reports My Database

1. Use the calendar to select the appropriate day to record your intakes (foods).
2. Type the name of the food item you wish to add and click "Find."
3. Choose the Meal and Amount, and click Save Intake after each entry.

Find Fast Entry

Search Tips Common Abbreviations

Delete	Meal	Amount	Items	Calories
<input type="checkbox"/>	Breakfast	1 cup	Cereal, bran flakes, w/raisins	187
<input type="checkbox"/>	Breakfast	1 cup	Milk, 1%, w/add vit A & D	102
<input type="checkbox"/>	Breakfast	1 each	Banana, fresh, med, 7" to 7 7/8" long	105
<input type="checkbox"/>	Lunch	1 each	Sandwich, veggie delite, w/white, 6"	230
<input type="checkbox"/>	Lunch	2 ounce	Chips, potato, bkd	266
<input type="checkbox"/>	Lunch	12 fluid ounce	Soda, Pepsi, diet	0
<input type="checkbox"/>	Snack	1 each	Crackers, animal, 2oz box	253
<input type="checkbox"/>	Dinner	4 ounce	Fish, halibut, Atlantic/Pacific, fillet, bkd/brd	159
<input type="checkbox"/>	Dinner	1 cup	Squash, zucchini, slices, stmd	25
<input type="checkbox"/>	Dinner	1 each	Potatoes, russet, w/skin, baked, med 2 1/4"-3 1/4"	168
<input type="checkbox"/>	Dinner	1.5 teaspoon	Margarine, soft, safflower oil	50
<input type="checkbox"/>	Dinner	1.5 cup	Coffee, latte, w/lowfat milk, decaf, tall	170
<input type="checkbox"/>	Snack	1.5 cup	Frozen Yogurt, vanilla, soft serve	352
Total Calories				2,067

Save Intake

Intakes Info

Calendar

October 2007

Su	Mo	Tu	We	Th	Fr	Sa
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Today
 Selected Day
 Day with Items

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Matthew Durant

