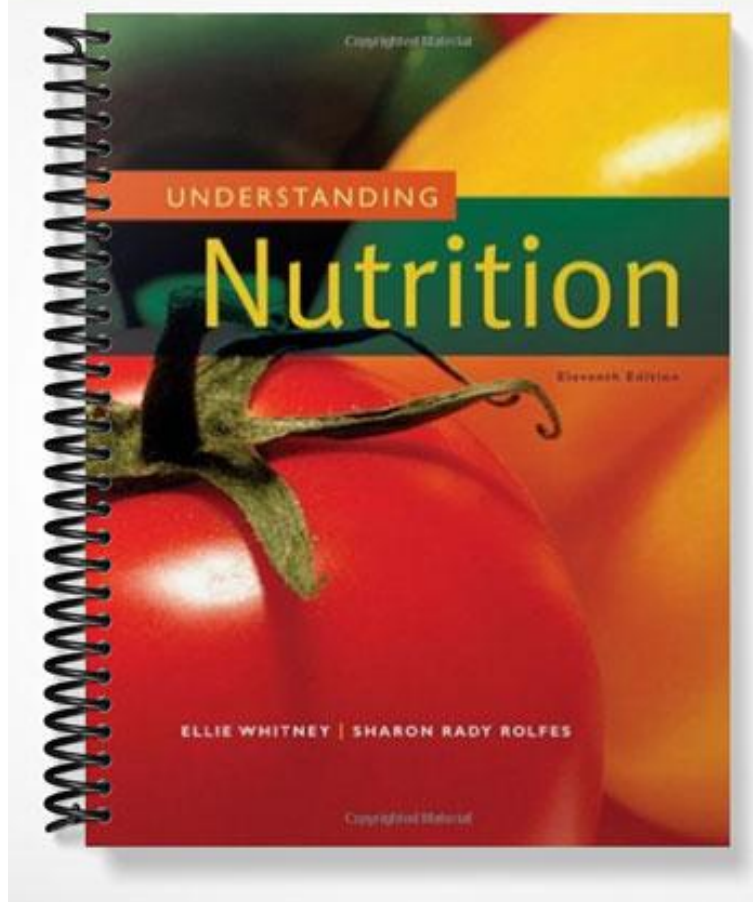


SOLUTIONS MANUAL



Chapter 1 – An Overview of Nutrition

Learning Objectives

After completing Chapter 1, the student will be able to:

1. Discuss the major reasons people make food choices.
2. List the six nutrients contained in food and a major use of each nutrient.
3. Identify the energy-providing nutrients and calculate the energy available from foods.
4. Explain nutritional genomics and its role in the science of nutrition.
5. List the types of research designs and the strengths and weaknesses of each.
6. Discuss Dietary Reference Intakes and the 4 parts of the DRI including the Estimated Average Requirements (EAR), Recommended Dietary Allowances (RDA), Adequate Intakes (AI), and Tolerable Upper Intake Levels (UL).
7. Explain the Estimated Energy Requirement (EER) and how it is used to maintain energy balance.
8. Discuss the Acceptable Macronutrient Distribution Ranges (AMDR) and how they relate to a healthy diet.
9. Utilize the DRI in the assessment of a healthy individual.
10. List the 4 parts of a nutritional assessment and apply them to individuals to detect malnutrition.
11. List the major methods used to survey the nutritional status of populations.
12. Identify the chronic diseases that are linked to diet or alcohol.
13. Identify accurate sources of nutrition information.
14. List the 8 red flags that identify nutrition misinformation.

Lecture Presentation Outline

“Of special interest to...” symbol key:



= Hot Topic



= Health Care Professionals



= Personal Health



= Science Majors

Key to instructor resource annotations (shown to the right of or below outline topics):

- CD = Available on Power Lecture CD-ROM (ISBN 0495116785): AF = animated figure, V = video, PP = practice problems (based on “How To” boxes or nutrition calculations)
- TRA = Transparency acetates: 11e TRA = 11th edition transparencies, 10e TRA = 10th edition
- Website = Available for download from book companion website: LE = lecture enrichment
- IM = Included in this instructor’s manual: WS = worksheet, HN = handout, CA = classroom activity, CI = Canadian information

Introductory/whole chapter resources: CD figure JPEGs; Test Bank; IM WS 1-4, CA 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, 1-8

I. Food Choices

IM WS 1-3

Food and **nutrition** play a significant role in life. An individual’s **diet** over time can affect health in a positive or negative way. **Chronic** and **acute** illness later in life can be affected by food choices throughout life. Many times, choices are made based on emotional, environmental, or peer influences rather than based on good nutrition.

- A. Personal preferences for flavors of food are the main reason people make food choices and choices can be influenced by genetics.
- B. Habits are comforting and food choices are often just a habit.
- C. Ethnic heritage or traditions are strong influences on eating.
- D. Social interactions such as special events, customs, and holidays are shared by groups of people. Food is often involved.
- E. Food availability, convenience, and the economy are affecting many food choices in today’s world.
- F. There are many positive and negative associations with food that affect what food is chosen to eat.

- G. Eating for emotional comfort can be the result of changes in brain chemistry that occur when foods are consumed. While this may be appropriate at times, it can lead to overeating.
- H. Values such as religious beliefs, political views, or environmental concerns may affect food choices.
- I Body weight and image can affect food choices both positively and negatively.
- J. The nutrition and health benefits of **functional foods**, such as whole, modified, or fortified foods, are becoming more popular.

II. The Nutrients

The nutrient classes include carbohydrate, fat, protein, vitamins, minerals and water. Nutrients support the growth, maintenance and repair of body tissues. Essential nutrients are those nutrients that the body cannot make or cannot make in sufficient quantities. Maintaining a healthy body requires the continual replenishment of **energy** and **nutrients** from food.

A. Nutrients in Foods and in the Body

10e TRA 1

1. Composition of foods includes the six nutrient classes of water, carbohydrates, lipids, proteins, vitamins and minerals. Foods can also contain **nonnutrients** and other compounds, such as fibers, **phytochemicals**, pigments, additives, alcohols and others.
2. Composition of the human body is made of chemicals similar to food.
3. Chemical composition of nutrients includes both **organic** (those that contain carbon) and **inorganic** (those that do not contain carbon) compounds.
4. **Essential** nutrients are those the body cannot make or cannot make in sufficient quantities to meet needs. These are also called **indispensable nutrients**.

B. Energy-Yielding Nutrients: Carbohydrate, Fat and Protein

1. Macro- vs. micronutrients
 - a. Carbohydrate, fat, and protein are **macronutrients** because the body needs them in large quantities.
 - b. Water, vitamins, and minerals do not provide energy and are known as **micronutrients** because the body needs them in smaller quantities.
2. Energy is measured in Calories (**calories, kilocalories, kcalories, kcal**). CD PP; IM CI 1.1
 - a. Internationally, food energy is measured in **joules**.
3. Energy from food differs in **energy density**. Carbohydrate yields 4 kcalories per gram, protein 4 kcalories per gram, and fat 9 kcalories per gram. CD PP
4. Activity in the body is fueled by food as energy is released from bonds within carbohydrate, fat, and protein as they are broken down. The processes by which food is broken down to yield energy are called **metabolism**.
5. Excess energy is stored in the body as compounds such as body fat.
6. Other roles of energy-yielding nutrients include building body tissues and regulating body processes.

C. **Vitamins** are organic, essential nutrients that allow the body to obtain energy from carbohydrate, fat, and protein.

D. **Minerals** are inorganic, essential nutrients that are found in the bones, teeth, and body fluids.

E. Water is an indispensable and abundant essential nutrient that participates in many life processes.

III. The Science of Nutrition

Website LE 1-1

The science of nutrition studies the nutrients in food and the body's handling of those nutrients. Nutrition research uses different types of scientific studies to answer questions about nutrition. The scientific protocol is used in conducting research. **Nutritional genomics** is a new field of study integrating nutrition, the human **genome**, and molecular biology.



A. Conducting Research

1. Nutrition Research tests **hypotheses** and develops **theories**.
2. Information based on personal experience is known as an **anecdote**.
3. Types of studies
 - a. Epidemiological studies include cross-sectional, case-control, and cohort designs.

10e TRA 2, 3

- b. Laboratory-based studies include animal studies and laboratory-based *in vitro* studies.
- c. Human intervention or clinical trials
- 2. Controls
 - a. **Subjects** are divided into two groups. The **experimental group** receives the treatment being studied and the **control group** does not receive the treatment.
 - b. **Randomization** is used to randomly assign subjects to the experimental or control group.
- 3. Sample sizes must be large to accurately detect differences.
- 4. **Placebos** are used to control the **placebo effect** with subjects in experiments. Subjects in **blind experiments** do not know if they are in the experimental or control group.
- 5. In **double-blind experiments**, the researchers and the subjects do not know their groups to prevent researcher bias.

 B. Analyzing Research Findings IM WS 1-1


- 1. Correlations and causes in experiments involve studying **variables** and **correlations**, or relationships, between variables.
 - a. A **positive correlation** is when the same thing happens to two variables: as one increases the other increases.
 - b. A **negative correlation** if when the opposite things happen to two variables: as one increases the other decreases.
- 2. Cautious conclusions must be drawn when examining or generalizing the results of a study.
- C. Publishing Research IM HN 1-2
 - 1. A **peer review** process is used to evaluate the procedures used and the conclusions drawn from a study.
 - 2. When a study has **validity** it means that the conclusions were supported by the findings.
 - 3. **Replication** is used to confirm or disprove findings.

IV. **Dietary Reference Intakes (DRI)** IM HN 1-1, CI 1.2

Dietary reference intakes are used to plan and evaluate diets for healthy people.

 A. Establishing Nutrient Recommendations 10e TRA 4, 5

- 1. **Estimated Average Requirement (EAR)** defines the **requirement** of a nutrient that supports a specific function in the body for half of the healthy population.
- 2. **Recommended Dietary Allowances (RDA)** use the EAR as a base and include sufficient daily amounts of nutrients to meet the known nutrient needs of practically all healthy populations. This recommendation considers **deficiencies**.
- 3. **Adequate Intakes (AI)** reflect the average daily amount of a nutrient without an established RDA that appears to be sufficient.
- 4. **Tolerable Upper Intake Level (UL)** is a maximum daily amount of a nutrient that appears safe for most healthy people and beyond which there is an increased risk of adverse health effects.


 B. Establishing Energy Recommendations 10e TRA 6


- 1. **Estimated Energy Requirement (EER)** represents the average daily energy intake to maintain energy balance and good health for population groups.
- 2. **Acceptable Macronutrient Distribution Range (AMDR)** represents the range of intakes for energy nutrients that provide adequate energy and nutrients and reduce risk of chronic disease.
- C. Using Nutrient Recommendations
 - 1. Apply to healthy people
 - 2. Recommendations are not minimum requirements and can be adjusted for individuals by **registered dietitians**.
 - 3. Achieved by consuming a variety of foods
 - 4. Apply to average daily intakes
 - 5. Each DRI category serves a unique purpose.
- D. Comparing Nutrient Recommendations
 - 1. Food and Agricultural Organization (FAO)
 - 2. World Health Organization (WHO)

V. Nutrition Assessment

Malnutrition is the deficiency (**undernutrition**) or excess (**overnutrition**) of a nutrient or energy.

IM CA 1-9; Website LE 1-2


-  A. Nutrition Assessment of Individuals - evaluates the many factors that influence or reflect nutritional health.
1. Historical information regarding diet, health status, drug use, and socioeconomic status is gathered.
 2. **Anthropometric** data measure physical characteristics including height and weight.
 3. Physical examinations require skill and reveal possible nutrition imbalances.
 4. Laboratory tests detect early signs of malnutrition.
 5. Stages in Nutrient Deficiency (example is given for iron)
 - a. **Overt** is easy to observe
 - b. **Primary deficiency** is inadequate dietary intake
 - c. **Secondary deficiency** is caused by disease or drugs
 - d. **Subclinical deficiency** is the early stages of deficiency without outward signs
 - e. **Covert** is hidden


-  B. Nutritional Assessment of Populations
1. National Nutrition Surveys IM CI 1.3; Website LE 1-3
 - a. National Nutrition Monitoring Program uses survey research to collect data on foods people eat and people's health status.
 - b. Data collected is used for nutrition policy, food assistance programs and food supply regulation.
 2. National Health Goals
 - a. **Healthy People** is a national public health initiative under the U.S. Department of Health and Human Services that is published every 10 years.
 - b. Identifies the most significant threats to health
 - c. Focuses efforts on eliminating these threats
 3. National Trends show an increased intake of fast food, increased portion sizes, and an increased consumption of energy-dense foods and drinks. This intake is associated with an increased risk for overweight and obesity.

VI. Diet and Health

11e TRA 1


Diet plays a vital role in supporting health. Current research focuses on the development of **chronic disease** due to nutrient and energy excesses.



-  A. Chronic Diseases
1. Research indicates that behavior and certain conditions are related to disease.
 2. Five of six leading causes of death have a relationship with diet or alcohol.
 3. Many leading causes of death have a relationship with obesity.

-  B. Risk Factors for Chronic Diseases
1. **Risk factors** persist over time.
 2. Risk factors cluster and focusing on one factor may improve another.
 3. Risk factors in perspective: The most prominent are tobacco use, diet and activity patterns and alcohol use.

VII. Highlight: Nutrition Information and Misinformation—On the Net and in the News IM HN 1-3, CI Highlight

There is both potential and danger in relying on the Internet and media for nutrition information. It is important to be able to identify reliable sources of nutrition information. Nutrition experts and other health care professionals are reliable sources.

-  A. Nutrition on the Net (**Internet, World Wide Web, www, cyberspace, websites**) IM WS 1-2, CA 1-10
1. **Internet** information can be published by ANYONE.
 2. May be high-quality information: National Library of Medicine's PubMed
 3. May be misleading, incomplete, and inaccurate

- B. Nutrition in the News
 1. Can be misleading and contradictory
 2. May report scientific findings prematurely
-  C. Identifying Nutrition Experts
 1. Consumers listen to many people except dietitians.
 2. Qualifications of the speaker must be evaluated.
 3. **Dietitians** have been educated and trained in nutrition.
 4. Physicians and Other Health Care Professionals
 - a. **American Dietetic Association (ADA)** recommends nutrition education be a part of all health care professionals' curricula.
 - b. A qualified nutrition expert is a **registered dietitian (RD)**.
 5. Registered Dietitians (RD)
 - a. Maintain up-to-date **registration**
 - b. May use the title **nutritionist**
 - c. Many states require a **license to practice**. These are **licensed dietitians (LD)**.
 - d. **Certified nutritionists, certified nutritional consultants, and certified nutritional therapists** do not have the same credentials as an RD.
 - e. **Public health dietitians** work for government-funded agencies.
 6. Other Dietary Employees
 - a. **Dietetic Technicians** assist RDs
 - b. **Dietetic Technicians Registered (DTR)** are dietetic technicians that have passed a national exam.
- D. Identifying Fake Credentials
 1. Look for a degree from an **accredited** college or university.
 2. Be careful of **correspondence schools**.
 3. **Fraudulent** businesses may provide false credentials.
-  E. Red Flags of Nutritional **Quackery**
 1. Nutritional **misinformation** can be identified by using the following eight red flags:
 - a. Satisfaction guaranteed
 - b. Quick and easy fixes
 - c. Natural
 - d. One product does all
 - e. Time tested
 - f. Paranoid accusations
 - g. Personal testimonials
 - h. Meaningless medical jargon

Q & As for Discussion

1. **Give several reasons (and examples) why people make the food choices that they do.**
 Personal preference, habit, ethnic heritage or tradition, social interactions, availability, convenience, economy, positive and negative associations, emotional comfort, values, image, nutrition.
2. **What is a nutrient? Name the six classes of nutrients found in foods. What is an essential nutrient?**
 A substance obtained from food and used in the body to promote growth, maintenance, and repair.
 Carbohydrate, fat, protein, vitamins, minerals, and water. Essential: must be obtained from an outside source.
3. **Which nutrients are inorganic and which are organic? Discuss the significance of that distinction.**
 Organic nutrients: carbohydrates, fats, proteins, vitamins. Inorganic nutrients: minerals, water. Organic means all carbon compounds, not necessarily living things.
4. **Which nutrients yield energy and how much energy do they yield per gram? How is energy measured?**
 Energy-yielding nutrients: carbohydrate (4 kcal/g), fat (9 kcal/g), protein (4 kcal/g). Measured in calories or kilocalories.

5. Describe how alcohol resembles nutrients. Why is alcohol not considered a nutrient?

Alcohol yields energy (7 kcal per gram) when metabolized, but alcohol is not considered a nutrient because it does not support the growth, maintenance, or repair of the body.

6. What is the science of nutrition? Describe the types of research studies and methods used in acquiring nutrition information.

The science of nutrition is the study of the nutrients in foods and the body's handling of those nutrients. Epidemiological studies, case-control studies, animal studies, and human intervention (or clinical) trials are all used to acquire information.

7. Explain how variables might be correlational but not causal.

Correlational variables are associated with each other; causal variables require a mechanism and indicate that one causes the other.

8. What are the DRI? Who develops the DRI? To whom do they apply? How are they used? In your description, identify the four categories of DRI and indicate how they are related.

The DRI are the Dietary Reference Intakes. They are a set of four nutrient intake values that can be used to plan and evaluate diets for healthy people. They are developed by the DRI Committee. Members of the committee are selected from the Food and Nutrition Board of the Institute of Medicine, the National Academy of Sciences, and Health Canada. The four categories include the Estimated Average Requirement (defines the amount of a nutrient that supports a specific function in the body for half of the population); the Recommended Dietary Allowance (uses Estimated Average Requirement to establish a goal for dietary intake that will meet the needs of almost all healthy people); an Adequate Intake (serve a similar purpose when an RDA cannot be determined); and Tolerable Upper Intake Level (establishes the highest amount that appears safe for regular consumption).

9. What judgment factors are involved in setting the energy and nutrient intake recommendations?

How much of a nutrient a person needs, which is determined by studying deficiency states, nutrient stores, and depletion, and by measuring the body's intake and excretion of the nutrient; that different individuals have different requirements; at what dividing line the bulk of the population is covered.

10. What happens when people either get too little or too much energy or nutrients? Define malnutrition, undernutrition, and overnutrition. Describe the four methods used to detect energy and nutrient deficiencies and excesses.

They get sick and show signs of deficiencies. Malnutrition is poor nutrition status, undernutrition is underconsumption of food energy or nutrients severe enough to cause disease or increased susceptibility to disease, and overnutrition is overconsumption of food energy or nutrients severe enough to cause disease or to cause increased susceptibility to disease. They are detected through nutrition assessment techniques (anthropometric measures, lab tests, physical findings, and diet history).

11. What methods are used in nutrition surveys? What kinds of information can these surveys provide?

Administering questionnaires, conducting interviews, collecting anthropometric measurements, and physical examinations on groups of people are methods used in nutrition surveys. Food consumption surveys and nutrition status surveys can provide information regarding amounts and kinds of foods people consume as well as evaluate people's nutrition status.

12. Describe risk factors and their relationships to disease.

Factors that increase the risk of developing chronic diseases are called risk factors. A strong association between a risk factor and a disease means that when the factor is present, the likelihood of developing the disease increases.

Handouts/Assignment Worksheets

The following handouts/worksheets for Chapter 1 are included in this manual (at the end of this chapter):

- Worksheet 1-1: Evaluation of Published Nutrition Information
- Worksheet 1-2: Research Project Using the Internet
- Worksheet 1-3: Influences on Food Choices¹
- Worksheet 1-4: Chapter 1 Crossword Puzzle
- Handout 1-1: DRI Terms and Nutrients¹
- Handout 1-2: Parts of a Research Article¹
- Handout 1-3: Sources of Reliable Nutrition Information¹

Worksheet Answer Key

Worksheets 1-1, 1-2, and 1-3 – Answers will vary.

Worksheet 1-4: Chapter 1 Crossword Puzzle

- | | | | |
|--------------|-----------------|-------------------|-------------------------|
| 1. foods | 4. vitamins | 7. malnutrition | 10. essential nutrients |
| 2. organic | 5. risk factors | 8. compounds | |
| 3. nutrition | 6. diet | 9. phytochemicals | |

Classroom Activities

A nutrition course should begin on a note of excitement. The best classes involve students and help them to see nutrition’s importance to them. Once they are hooked on nutrition because they feel personally involved with it, they will be motivated to learn about nutrition topics.

Classroom Activity 1-1: Students’ Burning Questions²

Objective: Introduction to nutrition

Class size: All sizes

Materials needed: Post-It notes (3 per student), 20 sheets construction paper, tape

Instructions: The first day of class, give each student three “Post-It” notes. On each note, students are to write down a “burning” question they have about nutrition. While they are doing this, tape twenty large pieces of construction paper around the room, each with a title that roughly corresponds to chapters of the text.

When they finish writing their questions, have them categorize their Post-It notes according to the twenty topics by placing their Post-It on the piece of construction paper that relates to their question. When they finish, ask them to take turns reading the questions that they have generated. Before the next class, check the categorization of their questions and rearrange the Post-It notes if necessary. As you begin a new chapter, bring the corresponding piece of construction paper to class, and read the questions aloud.

This activity helps reassure students, early on, that you will (or won’t) be covering some of their “burning” questions. It also helps show students the relevance of the information you’re covering in class, and helps show instructors the interests of the students.

Classroom Activity 1-2: “Find a Person Who” Introduction Activity

Objective: Enhancing emotional classroom environment

Class size: All sizes

Materials needed: Copy of form described below (developed by instructor) for each student

Instructions: Students sometimes enjoy classes more when they are acquainted with other students. One way to assist this process is by providing students with a “Find a Person Who” form. Develop a form several columns wide and several rows long that lists a variety of traits in each square such as: enjoys cooking, recycles, has a pet, is a

¹ Contributed by Sharon Rady Rolfes.

² Activity provided by: Caroline Roberts, R.D., M.P.H.—Nutrition Education Specialist for California Department of Education and Instructor at Sierra College

nutrition major, etc. Instruct students to walk around the class, introduce themselves to each other, and try to find a person who fits the categories described on the sheet. When they find someone who fits a category, have them write person's first name in that category. The goal is to complete the sheet. You may also suggest that they exchange e-mail addresses or phone numbers and form study groups. This activity works best for small to medium size classes.

Classroom Activity 1-3: Brown-Bag Introduction Activity

Objective: Establishing positive classroom environment

Class size: Small to medium

Instructions: In the class period preceding this introduction activity, read the following list of categories: a hobby or interest that students enjoy, something that is a favorite (color, book, music, food), future plans or goals, something they would like to do better, a place they'd like to visit, something special about family or friends, the best part of their last vacation, a healthy activity they like to do, and a talent or special ability they have. From this list, students are to select one item that represents each of 3 categories and bring these 3 items to class in a small brown bag. They should try to select items that are 3 dimensional and unique. During class they will share the contents of their brown bags with the class. This is a good way for students to become acquainted with others. This activity works best with small classes.

Classroom Activity 1-4: Getting Acquainted Activity

Objective: Establishing positive classroom environment

Class size: Small to medium

Instructions: This activity allows students to learn more about each other and can provide an environment in which people practice listening skills. Instruct students to pair off with someone that they do not know very well. Give the students 10-15 minutes to converse and ask some general questions about each other. Bring the group back together in a large circle with each student sitting next to his or her partner. Ask each student to introduce and speak about his or her new friend. This activity works best for small and medium sized classes.

Classroom Activity 1-5: "How Is Your Day Going?" Activity

Objective: Enhancing positive classroom environment

Class size: Small to medium

Instructor: An instructor who displays sincere caring about students is likely to be effective at gaining student trust. At the beginning of class, tell students you want to find out how they are doing. Instruct students to individually introduce themselves to the class by stating their name, where they are from, and what type of day they are having (either A, B, or C day). Then they are to share why they are having that type of day. The next person repeats the process sharing information about themselves and their day, then repeats what the other students shared. This can be a challenging activity, especially in larger classes. This activity is most appropriate for small to medium size classes.

Classroom Activity 1-6: Who Are You? Introduction Activity

Objective: Establishing rapport

Class size: Any

Materials needed: 1 index card per student

Instructions: Instructors who know their students and can refer to them by name are better equipped to gain trust and be effective in the classroom. Distribute index cards to each student and instruct students to record information about themselves on each card. Write on the board the information you are interested in obtaining. Some suggestions include: name, address, phone, e-mail, major, year in college, home town, employment, professional goals, hobbies, what they hope to learn from the class, reason for taking the class, and something interesting and/or unique about themselves. After students have recorded this information, you may ask them to introduce themselves to the class or you may simply collect the cards to help you learn more about your students. Instructors may want to use the cards to learn student names.

Classroom Activity 1-7: Chapter Opening Quiz³

Objective: Introducing new material

Class size: Any

Instructions: As a way of introducing any new chapter, give a "quiz" to the class. The students will moan initially, but they will enjoy the activity once you get underway and they realize that it is taken as a class and does not count towards their grade. The "quiz" asks ten true/false or multiple-choice questions projected on the overhead from a transparency. The students are not allowed to talk during the quiz, and must show their choice of answer by raising hands. Mark the answer chosen by the majority of hands on the transparency. Then go over the correct answers

³ Activity provided by: Lin Brown, Shasta College, Redding, CA

(their curiosity is piqued!) and seize the “teachable moment.” Generally, they score about 55% and realize there is a lot to learn.

This “pretest” is valuable because it creates interest in the subject matter, challenges students’ erroneously-held beliefs, and introduces new terms and concepts. It is valuable to instructors in assessing the level of knowledge and attitudes in the subject area and identifying the needs and the focus for the unit.

Classroom Activity 1-8: Using FAQs For Class Information⁴

Objective: Disseminating class information

Class size: Any

Instructions: As many people know, a Frequently Asked Questions page is worthwhile to examine. The questions asked and answered are the type of questions a student may have about the class but may not have thought about until reading them. These questions should be designed carefully based on questions that are often received so they will be of high interest to students. These could be the top ten questions for surviving the nutrition class. A sample question is: “What is the best way for a student to learn nutrition well enough to ace this course?” If you can cover questions that students really have about the course, you’ll be showing them early on that you understand their concerns and can also provide some good advice.

Classroom Activity 1-9: Exploration of “MyPyramid.Gov” Web Site⁵

Key concepts: MyPyramid diet planning tools, Internet skills

Class size: Any

Objective: The purpose of this assignment to help the student become familiar with the available resources offered on the My Pyramid web site provided by the United States Department of Agriculture (USDA). Since the majority of people have computer access (24/7), this activity will help the student to see what is available to both the health professional and health consumer on a daily basis.

Instructions:

1. Divide the students in the class into 5 equal groups. This can be accomplished either through a lottery ticket mechanism or use of a student roster list.
2. Secure online access and have each of the student groups go to the following URL address:
<http://mypyramid.gov/>.
3. Assign each group to one of the following areas: (1) My Pyramid for kids, (2) Tour My Pyramid, (3) Inside the pyramid, (4) Tips & Resources and (5) My Pyramid Plan.
4. For each group assignment, have the student group enter into the assigned area and ascertain the following information:
 - a. Describe the content area of the link.
 - b. Identify the resources available from the link.
 - c. Describe how many steps are required to get to all of the information and the length of time involved in accessing the information.
5. If the class is Web enhanced, post a My Pyramid Discussion Board to the course site. Have the student groups post their critical appraisal of each of the assigned links prior to coming to the next class session. If the course is not Web enhanced, then have the groups do a write-up of the assignment.
6. At the next class session, review the information posted on the Web, or in the case of the course not being Web enhanced, have the groups bring their written information to class and discuss the groups’ findings in terms of these criteria:
 - a. Was the information easy to access? (Yes or no.)
 - b. If the information was not easy to access for you as a “college student,” then how do you think that others who have less experience with either the subject matter or computer competency would be able to access the information?

⁴ Activity provided by: Dr. Neil Allison, University of Arkansas

⁵ Contributed by Daryle Wane.

- c. Do you think that the information was representative across cultural lines?
- d. Overall, who do you think would be most likely to benefit from the information on this Web site?

Classroom Activity 1-10: Using the Internet as a Research Tool

Key concept: Research process

Class size: Any

Instructions: The Internet can be used as a valuable research tool in nutrition. The student can become familiar with the diversity of Internet resources and can learn to participate in online discussions about nutrition topics in class-based and listserv groups. Worksheet 1-2 provides assignments to help students acquire Internet skills.

Lecture Enrichments

The following lecture enrichment materials are included on the Multimedia Manager and available for download from the instructor companion website for *Understanding Nutrition* 11th edition:

- 1-1: The Science of Nutrition
- 1-2: Physician/Client versus Doctor/Patient
- 1-3: Early Nutrition Surveys

Canadian Information

Introduction

Nutrition instructors in Canada are challenged to provide current and accurate Canadian information to their students about: food labelling; nutrition and physical activity guidelines and recommendations; nutrition, health and social programs; and nutrition and physical activity education resources. Prior to and since the release of the first set of Dietary Reference Intakes in 1997, effort has been taken to harmonize many nutrition-related policies and standards of Canada and the United States. Canadian nutrition educators and colleagues in the United States use a common research base for describing how nutrients function in the body and for planning nutrition interventions. However, differences in food intake patterns, health statistics, and health policy affect the content and format of nutrition programs.

Canadian instructors and students now have Internet access to much of the Canadian information, along with similar information for other countries of the world. Students often feel challenged to discern unreliable from reliable and credible web-based Canadian nutrition information and resources. This Canadian Information section identifies Canadian regulations, standards, programs, research and resources to help instructors locate and use Canadian information in their courses. Canadian information is provided according to the topics discussed in each chapter or highlight in *Understanding Nutrition*, Eleventh Edition.

1.1 How to Calculate the Energy Available from Foods in Kilocalories

Energy values found in food composition tables and on food labels in Canada are expressed as Calories (kilocalories). To become more familiar with kilocalories, students could calculate the energy available in foods using the example in “How to Calculate the Energy Available from Foods” and the energy conversion factors for the macronutrients found in Chapter 1 of the textbook.

1.2 Dietary Reference Intakes

As Chapter 1 of the textbook indicates, Canada has participated in the development and implementation of the Dietary Reference Intakes (DRI). The DRI provide a set of nutrient and energy recommendations for both Canada and the United States, and support harmonization of trade-related issues and freer trade of food. Health Canada provides current information about the DRI on its web site (www.hc-sc.gc.ca/fn-an/nutrition/reference/index_e.html). Nutrition instructors will find the Question and Answers paper particularly helpful for planning lectures on the DRI. Instructors who want to increase their understanding of DRI and their application can take an on-line course through the Dietitians of Canada web site at www.dietitians.ca.

These two journal articles explain how to apply the DRI to assess and plan diets.

Murphy SP, Barr SI, and Poos MI. 2002. Using the New Dietary Reference Intakes to Assess Diets: A Map to the Maze. *Nutrition Reviews*, 60(9):267-275.

Murphy SP, and Barr SI. 2005. Challenges in Using the Dietary Reference Intakes to Plan Diets for Groups. *Nutrition Reviews*, 63(8):267-271.

1.3 Nutrition Assessment of the Canadian Population

Canada does not have a formal, systematic program of national food and nutrition surveillance, such as HANES (Health and Nutrition Examination Survey), NFCS (Nationwide Food Consumption Survey) and NHANES (National Health and Nutrition Examination Survey). Canada's first comprehensive national nutrition survey, the Nutrition Canada Survey, was conducted in 1970-72. During the 1990s, several provincial surveys were completed under the Canadian Heart Health Initiative. Methods of data collection varied with the different surveys; hence, the results of these studies have not been compiled nationally or used for comparisons between regions. To date, New Brunswick, Nova Scotia, Prince Edward Island, Québec, Saskatchewan, Ontario, British Columbia and Newfoundland and Labrador have published reports on dietary intake patterns in their provinces. Refer to Health Canada's guide to provincial contacts (www.hc-sc.gc.ca/fn-an/surveill/nutrition/prov/pns_contacts_e.html) for survey-specific information.

Published in 2001, the Canadian food intake survey, "Food Habits of Canadians," used data collected between August 1997 and July 1998 from five regions of Canada (Atlantic, Québec, Ontario, Prairies and British Columbia).⁶ The results of this survey showed that the percent of energy from fat was 29 to 31%, close to the recommended 30%. The mean intakes of milk products and vegetables and fruit were below the minimum recommended servings. A workbook, *Food Habits of Canadians*, has been prepared by the Beef Information Centre and is available for nutrition educators. Check their website for ordering information (www.beefinfo.org/OrderCentre_eng/default.aspx).

"Improving the Health of Canadians" (2004) provides a broad look at the health of Canadians and the impact of the determinants of health. Information from this report can be used when discussing issues of low income or food insecurity (Chapter 20), or during the appropriate stage of the life cycle. The report, produced by the Canadian Population Health Initiative, is available from the Canadian Institute of Health Information web site, www.cihi.ca.

During 2004, the Canadian Community Health Survey (CCHS), Cycle 2.2: Nutrition, collected 24-hour dietary recall data, nutrient supplement use data, and related data on Canadians at a provincial level. This collaborative initiative between Health Canada and Statistics Canada represents the largest and most comprehensive survey ever conducted of what Canadians eat. Trained interviewers directly measured height and weight data of a nationally representative sample of Canadians. The measured data differ from self-reported data used in previous surveys. Other data collected included: physical activities, chronic health conditions, smoking, alcohol use, food insecurity and socio-demographic characteristics. In July 2005, reports on adult obesity and childhood overweight were released from the General Health Component. In July 2006, a report titled "Overview of Canadians' Eating Habits" was released using data from the General Health and 24-Hour Dietary Recall Components. These reports are available at www.hc-sc.gc.ca/fn-an/surveill/nutrition/commun/cchs_focus-volet_esc_e.html#2.

The National Population Health Survey (NPHS) is a 20-year longitudinal survey started in 1993/1994 and is conducted by Statistics Canada. The survey collects data on the same individuals every two years.⁷ The original sample was selected to be representative of the Canadian population. The 1999 report, "Toward a Healthy Future: Second Report on the Health of Canadians," used findings from the NPHS and is available at the Public Health Agency of Canada's web site: www.phac-aspc.gc.ca/ph-sp/phdd/report/toward/index.html. Two recent reports published in 2005 also used data from the NPHS: Healthy Aging (available at:

⁶ Gray-Donald K, Jacobs-Starkey L, Johnson-Down L. 2000. Food habits of Canadians: Reduction in fat intake over a generation. *Can J Public Health* 91:381-385.

⁷ Health Canada. *Canadians and Healthy Eating: How Are We Doing? Nutrition Highlights, National Population Health Survey, 1994-95*. Ottawa: Health Canada, 1998.

www.statcan.ca/bsolc/english/bsolc?catno=82-005-X20050018439) and Obesity: A Growing Concern (available at: www.statcan.ca/bsolc/english/bsolc?catno=82-618-M2005003).

Highlight 1: Nutrition Information and Misinformation—On the Net and in the News

Dietitians' Credentials in Canada

The qualifications for admission to Dietitians of Canada (formerly The Canadian Dietetic Association) are similar to those for the American Dietetic Association. Dietitians of Canada (www.dietitians.ca) accredits university undergraduate programs and dietetic internship programs which qualify dietitians to practice. There is no single designation of title or initials for Canadian dietitians.

Provincial Regulatory Bodies

Provincial government legislation determines the professional designation for health professionals who practice in the province. Many provinces have established colleges under their health professions legislation to ensure that the public receives quality care from dietitians. Dietitians are registered to practice through a college or provincial dietetic regulatory body. The public can take any complaints about dietetic practice to the college or regulatory body. Provincial colleges and regulatory bodies exist for public safety. These regulatory bodies:

- monitor the competence of members, e.g. mandatory continuing education;
- protect the public from unsafe or unethical dietetic practice;
- protect the use of regulated title designation and initials, e.g. R.D.; and
- review the professional conduct of members based on complaints, and discipline members where appropriate.

All provinces include the word “dietitian” or “diététiste” in the title and protect these titles from use by unqualified individuals. The following list provides the designation for dietitians in each of the provinces and the respective contact information for each provincial college or regulatory body. For the most current contact information, go to the “Find a Nutrition Professional” section of the Dietitians of Canada web site (www.dietitians.ca), select “Qualifications of a Dietitian” then choose “Provincial Regulatory Bodies.”

Province	Designation	Contact Information
Alberta	R.D. (Registered Dietitian)	www.collegeofdietitians.ab.ca
British Columbia	R.D. (Registered Dietitian)	www.collegeofdietitiansbc.org
Manitoba	R.D. (Registered Dietitian)	College of Dietitians of Manitoba 36-1313 Border Street, Winnipeg, MB R3H 0X4 Phone: (204) 694-0532
New Brunswick	RD (Registered Dietitian) or RDN (Registered Dietitian-Nutritionist) or P.Dt. (Professional Dietitian)	www.adnb-nbad.com
Newfoundland	R.Dt. (Registered Dietitian)	Newfoundland and Labrador College of Dietitians PO Box 1756, Postal Station C, St. John's, NL A1C 5P5 Toll free: 1-877-753-4040
Nova Scotia	P.Dt. (Professional Dietitian)	www.nsdassoc.ca
Ontario	R.D. (Registered Dietitian) or Dt.P. (diététiste professionnelle)	www.cdo.on.ca
Prince Edward Island	P.Dt. (Professional Dietitian)	PEI Dietitians Registration Board 153 Spring Street Summerside, PE/C1N 3G2 Phone: (902) 436-2438
Québec	Dt.P. (diététiste professionnelle) or P.Dt. (Professional Dietitian) or R.D. (Registered Dietitian)	www.opdq.org
Saskatchewan	P.Dt. (Professional Dietitian) or R.D. (Registered Dietitian)	www.saskdietitians.org

Canadian Web-based Resources

1. Most university libraries have on-line resources to help students critically assess the reliability and credibility of information provided on web sites. Direct your students to these resources.
2. An excellent web-based source of reliable nutrition information is the Canadian Health Network (www.canadian-health-network.ca). This network consists of affiliates (e.g. Dietitians of Canada), hundreds of health-related organizations and the Canadian Health Network division of the Public Health Agency of Canada.
3. The Canada Health Portal (http://chp-pcs.gc.ca/CHP/index_e.jsp) is also a web-based resource that provides links to credible and reliable health information sites.
4. The Nutrition Resource Centre (www.nutritionrc.ca) is part of the Ontario Public Health Association. The centre provides important resources for nutrition professionals in Ontario, and many resources that can apply to other areas of Canada.
5. Canadian Council of Food and Nutrition (www.ccfm.ca) offers a listing of reliable food and nutrition links in its Action section.

Worksheet 1-1: Evaluation of Published Nutrition Information

Literature Critique: Critical Evaluation of Published Nutrition Information— “Should I Believe What I Just Read?”

Assignment for discussion: Carefully read a journal article and answer the following questions on a separate sheet of paper.

1. Summarize the basic idea of the article in a short paragraph.
2.
 - a. What are the credentials of the author(s)? What do the abbreviations after the name(s) mean? Do they enhance the authors' credibility? Explain.
 - b. Is the author affiliated with an organization or institution? Does the affiliation with the organization or institution enhance the authors' credibility? Briefly explain.
 - c. Does the periodical have an editorial board? Do the editors' credentials enhance the article's credibility? Where does one look in a periodical for the editorial board?
3.
 - a. Is scientific research being presented or discussed? Is the research current?
 - b. If so, what specific kinds of research or data are presented or cited to support the ideas?
 - c. Were references listed to allow readers to investigate the information's original source? Were full citations provided?
4.
 - a. What is the underlying hypothesis (if/then, cause/effect, etc.)?
 - b. What are the article's conclusions/recommendations?
 - c. Are the conclusions or recommendations supported by the research discussion? Explain briefly why or why not.
5.
 - a. Design and describe in depth additional research that could more decisively test the hypothesis identified. Pay particular attention to details and controls.
 - b. Indicate what will be measured.
 - c. State the type of experimental design and type of experiment.
6. Identify the statements in the article that you believe and those that you do not believe, and discuss why or why not for each.
7. What sources other than those listed in the periodical would you refer to if you were to research the article's topic further?

Source: Adapted with permission of: Deborah Fleurant, MOE Thesis, University of New Hampshire, 1989 (Thesis Advisor Sam Smith)

Worksheet 1-2: Research Project Using the Internet

This research project will employ the use of the Internet as a research tool. The student will be expected to become familiar with the diversity of Internet resources. The purpose of this project is to develop research skills using the Internet.

1. Access the world wide web. Access several search engines for locating publications in peer-reviewed journals.
2. Select a topic such as vitamin A, osteoporosis prevention, or obesity among children.

Topic chosen:

3. Search for articles using key words related to your topic.

Key words you used:

4. Print out the references of articles that you found.
5. Print out abstracts from selected articles that are most interesting.
6. Obtain entire articles for selected articles.
7. Discuss your findings (1-2 pages, typed).

Worksheet 1-3: Influences on Food Choices

We decide what to eat, when to eat, and even whether to eat for a variety of reasons. Examine the factors that influence your food choices by keeping a food diary for 24 hours. Record the times and places of meals and snacks, the types and amounts of foods eaten, and a description of your thoughts and feelings when eating. Now examine your food record and consider your choices.

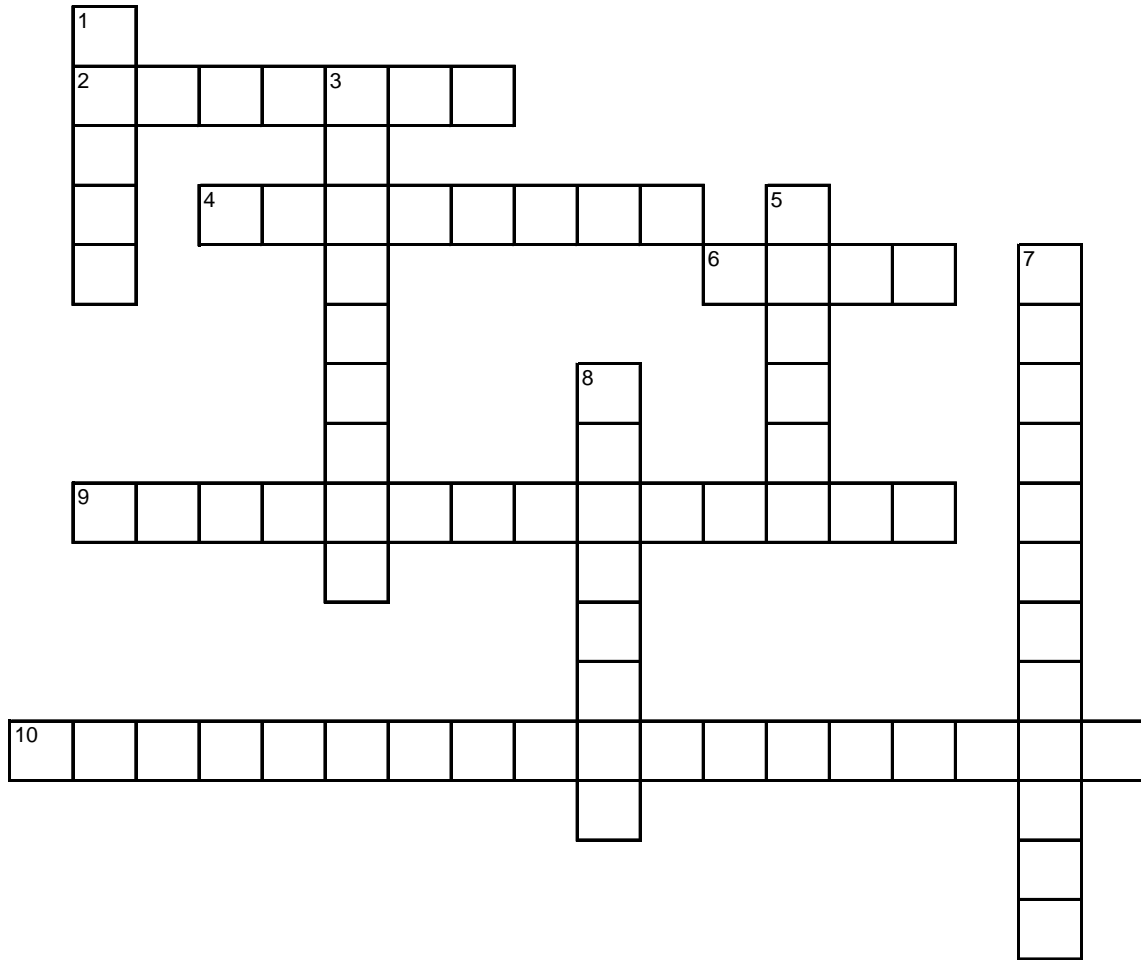
1. Which, if any, of your food choices were influenced by emotions (happiness, boredom, or disappointment, for example)?
2. Was social pressure a factor in any food decisions?
3. Which if any, of your food choices were influenced by marketing strategies or food advertisements?
4. How large a role do availability, convenience, and economy play in your food choices?
5. Do your age, ethnicity, or health concerns influence your food choices?
6. How many times did you eat because you were truly hungry? How often did you think of health and nutrition when making food choices? Were those food choices different from others made during the day?

Compare the choices you made in your 24-hour food diary to the USDA Food Guide recommendations. To obtain a set of personalized recommendations, you can enter your age, sex and activity level under “My Pyramid Plan” at the MyPyramid website, www.mypyramid.gov.

Food Groups	Suggested Amounts	Amounts Consumed
Grains		
Vegetables		
Fruit		
Milk		
Meat and beans		

7. Do you eat the suggested amounts from each of the five food groups daily?
8. Do you try to vary your choices within each food group from day to day?
9. What dietary changes could you make to improve your chances of enjoying good health?

Worksheet 1-4: Chapter 1 Crossword Puzzle



<u>Across</u>	<u>Down</u>
2. a substance or a molecule containing carbon-carbon bonds or carbon-hydrogen bonds	1. products derived from plants or animals that can be taken into the body to yield nutrients for the maintenance of life and the growth and repair of tissues
4. organic, essential nutrients required in small amounts by the body for health	3. the science of foods and the nutrients and other substances they contain, and of their actions within the body
6. the foods and beverages a person consumes	5. factors associated with an elevated frequency of a disease but not proven to be causal
9. nonnutritive compounds found in plant-derived foods that have biological activity in the body.	7. any condition caused by excess or deficient food energy or nutrient intake or by an imbalance of nutrients
10. nutrients a person must obtain from food because the body cannot make them for itself in sufficient quantity to meet physiological needs	8. a substance composed of two or more different atoms; for example, H ₂ O

Handout 1-1: DRI Terms and Nutrients

Term	Definition	Nutrients
Dietary Reference Intakes (DRI)	A set of values for the dietary nutrient intakes of healthy people in the United States and Canada.	
Estimated Average Requirement (EAR)	The average daily amount of a nutrient that will maintain a specific biochemical or physiological function in half the healthy people of a given age and gender group.	Note: All nutrients with an RDA have an EAR.
Recommended Dietary Allowance (RDA)	The average daily amount of a nutrient considered adequate to meet the known nutrient needs of practically all healthy people; a goal for dietary intake by individuals.	Carbohydrate, protein Vitamins: Thiamin, riboflavin, niacin, vitamin B ₆ , folate, vitamin B ₁₂ , vitamin C, vitamin A, vitamin E Minerals: Phosphorus, magnesium, iron, zinc, iodine, selenium, copper, molybdenum
Adequate Intake (AI)	The average daily amount of a nutrient that appears sufficient to maintain a specified criterion; a value used as a guide for nutrient intake when an RDA cannot be determined.	Water, total fiber, total fat, linoleic acid, linolenic acid Vitamins: Biotin, pantothenic acid, choline, vitamin D, vitamin K Minerals: Sodium, chloride, potassium, calcium, manganese, fluoride, chromium
Tolerable Upper Intake Level (UL)	The maximum daily amount of a nutrient that appears safe for most healthy people and beyond which there is an increased risk of adverse health effects.	Vitamins: Niacin, vitamin B ₆ , folate, choline, vitamin C, vitamin A, vitamin D, vitamin E Minerals: Sodium, chloride, calcium, phosphorus, magnesium, iron, zinc, iodine, selenium, copper, manganese, fluoride, molybdenum, boron, nickel, vanadium

Handout 1-2: Parts of a Research Article

- **Abstract.** The abstract provides a brief overview of the article.
- **Introduction.** The introduction clearly states the purpose of the current study by proposing a hypothesis.
- **Review of literature.** A comprehensive review of the literature reveals all that science has uncovered on the subject to date.
- **Methodology.** The methodology section defines key terms and describes the instruments and procedures used in conducting the study.
- **Results.** The results report the findings and may include tables and figures that summarize the information.
- **Conclusions.** The conclusions drawn are those supported by the data and reflect the original purpose as stated in the introduction. Usually, they answer a few questions and raise several more.
- **References.** The references reflect the investigator's knowledge of the subject and should include an extensive list of relevant studies (including key studies several years old as well as current ones).

Handout 1-3: Sources of Reliable Nutrition Information

REVIEWS

Articles that examine all the major work on a subject are published in review journals like *Nutrition Reviews*. These articles provide references to all of the original work reviewed.



JOURNALS

Articles that present all the details of the methods, results, and conclusions of a particular study are published in journals like the *American Journal of Clinical Nutrition*.

INDEXES

Indexes provide a listing of research articles on a given subject. Several online indexes are available, but one of the best for nutrition research is PubMed, a service of the National Library of Medicine. For free access, visit www.pubmed.gov



WEBSITES

Websites on the Internet developed by credible sources, such as those listed on p. 34, can provide valuable nutrition information and direct users to other resources. A quick link to many of these nutrition resources is available when you visit www.wadsworth.com/nutrition