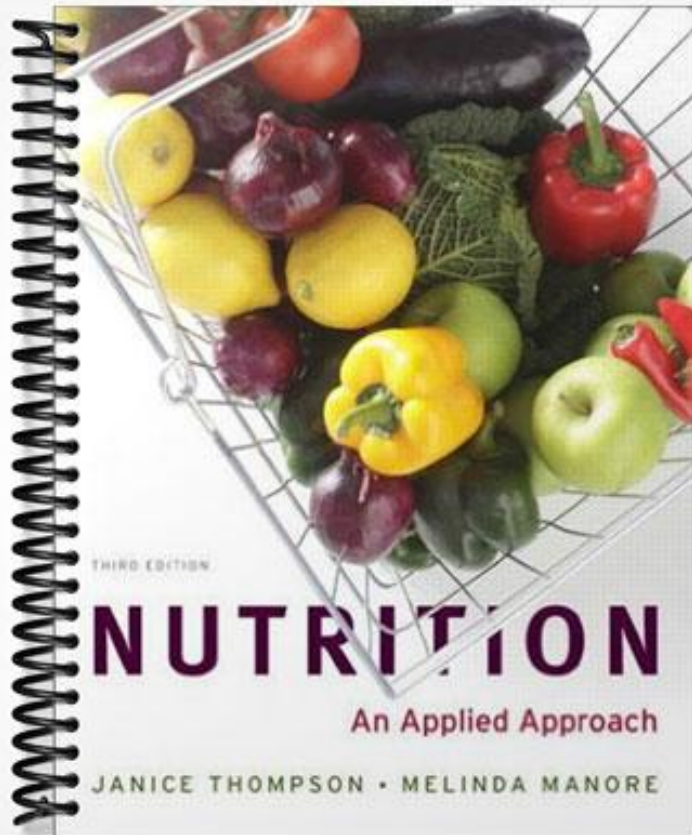


SOLUTIONS MANUAL



THIRD EDITION

NUTRITION

An Applied Approach

JANICE THOMPSON • MELINDA MANORE

Designing a Healthful Diet and In Depth: Phytochemicals

Chapter Summary

A healthful diet provides the proper combination of energy, nutrients, and fiber and has four characteristics: it is adequate, moderate, balanced, and varied. Many tools can be used to help design a healthful diet. The Nutrition Facts Panel on food labels provides valuable information to assist individuals in choosing more healthful foods. The Dietary Guidelines for Americans are a set of principles developed by the U.S. Department of Agriculture (USDA) and the U.S. Department of Health and Human Services (USDHHS) to assist Americans in designing healthful diets and lifestyles. The USDA has also developed a pyramid-based food guidance system called MyPyramid, which can be used to design a healthful diet that meets the goals of adequacy, moderation, balance, variety, as well as nutrient density. Many ethnic and cultural variations of the USDA Food guide allow for flexibility.

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

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

Chapter Objectives

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

1. Identify the characteristics of a healthful diet.
2. Name five components that must be included on food labels, and use the Nutrition Facts Panel to determine the nutritional adequacy of a given food.
3. Describe the Dietary Guidelines for Americans, and discuss how these Guidelines can be used to design a healthful diet.
4. Identify the food groups, number of servings, and serving sizes included in MyPyramid.
5. Explain how MyPyramid can be used to design a healthful diet.
6. List at least four ways to practice moderation and apply healthful dietary guidelines when eating out.

Chapter Outline

I. What Is a Healthful Diet?

- A. A healthful diet is adequate.
 - a. An adequate diet provides enough of the energy, nutrients, and fiber to maintain a person's health.
- B. A healthful diet is moderate.
 - a. Moderation refers to eating any foods in moderate amounts.
- C. A healthful diet is balanced.
 - a. A balanced diet contains the combinations of foods that provide the proper proportions of nutrients.
- D. A healthful diet is varied.
 - a. Variety refers to eating many different foods from the different food groups on a regular basis.

Additional Instructor Tools

PPT slides: 1–6

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

- A. Five components must be included on food labels.
 - 1. A statement of identity clearly tells us what the product is.
 - 2. The net contents statement describes the quantity of food in the entire package.
 - 3. The ingredient list shows all ingredients in descending order by weight.
 - 4. The name and address of the food manufacturer, packer, or distributor is useful to get more detailed information about a product.
 - 5. Nutrition information on the Nutrition Facts Panel is the primary tool to assist an individual in choosing healthful foods.
 - a. Serving size and servings per container are listed.
 - b. Calories and Calories from fat per serving are listed.
 - c. Various nutrients are listed.
 - d. Percent Daily Values (%DV) are included.
 - e. A footnote explains that the %DV is based on a 2,000-calorie diet and that individual needs may vary.
 - 6. Food labels can contain a variety of nutrient claims.
 - a. Nutrition Label Activity: How Do Health Claims on Food Labels Measure Up?
 - b. Nutri-Case: Gustavo.
- B. Dietary Guidelines for Americans are a set of principles developed by the U.S. Department of Agriculture (USDA) and U. S. Department of Health and Human Services (USDHHS) to assist Americans in designing a healthful diet and lifestyle.
 - 1. Consume adequate nutrients to promote health while staying within your energy needs.
 - a. Nutrient-dense foods are foods that give the highest level of nutrients for the least amount of energy.

2. Weight management is important to decrease risk of chronic disease.
 3. Engage in physical activity to promote health, psychological well-being, and a healthy body weight.
 4. Several food groups should be encouraged.
 5. Fat is an important part of a healthful diet, but high amounts should be avoided to prevent overweight and obesity.
 6. Moderate the intake of foods high in sugar and starch.
 7. Consume fewer than 2,300 mg of sodium per day and consume potassium-rich foods such as fruits and vegetables.
 8. Drink sensibly and in moderation if you choose to drink.
 9. Keep food safe to eat.
- C. The USDA Food Guide is another tool that can serve as a guide to design a healthful diet. The graphic representation of the USDA Food Guide is MyPyramid.
1. MyPyramid is intended to help Americans eat in moderation, eat a variety of foods, consume the right proportion of each recommended food group, personalize their eating plan, increase their physical activity, and set goals for gradually improving their food choices and lifestyle.
 2. The food groups emphasized by the USDA Food Guide are grains, vegetables, fruits, milk, and meat and beans; oils are also recommended.
 3. Discretionary Calories represent the extra amount of energy you can consume after you have met all of your essential needs by eating nutrient-dense foods.
 4. The USDA Food Guide also helps you to decide how much of each food you should eat (number of servings).
 5. The USDA Food Guide helps you to understand the proper serving size for different types of food.
 - a. Nutrition Label Activity: How Realistic Are the Serving Sizes Listed on Food Labels?
 - b. You Do the Math: How Much Exercise Is Needed to Combat Increasing Food Portion Sizes?
 6. It is easy to follow the MyPyramid system and still select foods to meet specific ethnic, religious, or other lifestyle preferences.
 - a. Hot Topic: The Mediterranean Diet.
 7. There are some limitations to the USDA Food Guide.
 - a. Serving sizes are relatively small and may be unrealistic.
 - b. Low-fat and low-calorie food choices are not clearly defined in each food category.

Additional Instructor Tools

PPT slides: 7–37

Animation: Reading Labels

Figures and Tables

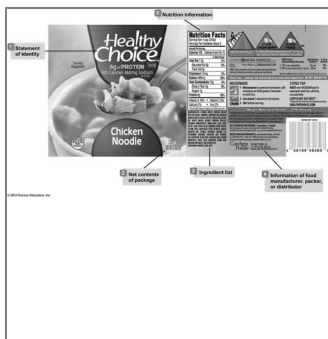


Figure 2.1
The five primary components required for food labels.

Figure 2.2
The Nutrition Facts Panel.

Amount	Class	Meaning
Energy	Calorie	Less than 1 mg sodium per serving
	Low Calorie	All or less than 5 mg sodium per serving
	Reduced Calorie	At least 20% fewer calories than reference food
Fat and Cholesterol	Fat free	Less than 0.5 g of fat per serving
	Low fat	Less than 3 g of fat per serving
	Reduced fat	At least 20% less fat per serving than reference food
	Low saturated fat	Less than 1.5 g of saturated fat per serving AND less than 3 g of total fat per serving
Reduced saturated fat	At least 20% less saturated fat AND saturated fat more than 1 g subtracted for loss of saturated fat compared to reference food	
	At least 20% less saturated fat AND 2 g or less subtracted for loss of saturated fat compared to reference food	
	At least 20% less saturated fat AND 2 g or less subtracted for loss of saturated fat compared to reference food	
	At least 20% less saturated fat AND 2 g or less subtracted for loss of saturated fat compared to reference food	
Fiber and Sugar	Good source of fiber	At least 2 g more fiber per serving than reference food
	Fiber or added fiber	2 g or 8 g fiber per serving
	Sugar free	Less than 0.5 g sugar per serving
	Low sugar	Less than 5 g sugar per serving
Sodium	Reduced sodium	At least 20% less sodium per serving than reference food
	Low sodium	Less than 5 mg sodium per serving
	Very low sodium	Less than 1 mg sodium per serving
	Reduced sodium	At least 20% less sodium per serving than reference food
Relative Claims	Free, reduced, no more	None or a small amount of grams sodium
	Lighter	This is a small amount of grams sodium
	Reduced fat, lower	This is a small amount of grams sodium
	More sodium, no salt	This is a small amount of grams sodium

Table 2.1
United States FDA–Approved Nutrient Terms and Definitions

Disorder/Health Concern	Claim	Example of Approved Claim Statement
Obesity	Calorie	High calorie or low calorie (low calorie claim only when serving size is 100 kcal or less)
Cardiovascular disease	Saturated fat and cholesterol	Trans fats, saturated fats and products that contain them, particularly visible fats, include trans fats which are partially used fats, and low-fat products that have low total fat, total cholesterol, and sodium
Cancer	White grain flour	White grain flour is low in fiber containing grain products, fruits, and vegetables may reduce the risk for some types of cancer, a claim associated with many factors
Hypertension and stroke	Sodium	Low sodium products that are a good source of potassium and fiber to reduce the risk of hypertension and stroke
Neurologic defects	Folate	Highly fortified products may reduce the risk of neural tube defects, a claim associated with many factors
Dental health	Sugar alcohols	Low sugar products that are a good source of potassium and fiber to reduce the risk of hypertension and stroke

Table 2.2
United States FDA–Approved Health Claims on Labels

FDA category	Health Claims Report Card	Required disclaimer
A	High Significant scientific agreement	Applies to claims listed in Table 2.2 No disclaimer needed
B	Moderate Evidence is not conclusive	*, although there is scientific evidence supporting the claim, the evidence is not conclusive.
C	Low Evidence is limited and not conclusive	"Some scientific evidence suggests... however, FDA has determined that this evidence is limited and not conclusive."
D	Extremely Low Little scientific evidence supporting this claim	"Very limited and preliminary scientific research suggests... FDA concludes that there is little scientific evidence supporting this claim."

Figure 2.3
United State's FDA Health Claims Report Card.

How to Incorporate the Dietary Guidelines for Americans into Your Daily Life	Key Points
Choose a variety of grains every day	Choose whole grains over refined grains
Choose a variety of vegetables every day	Choose dark green, red, and orange vegetables
Choose a variety of fruits every day	Choose whole fruits over fruit and juice
Choose a variety of protein sources every day	Choose lean meats, poultry, fish, eggs, tofu, nuts, and seeds
Choose a variety of dairy products every day	Choose low-fat or fat-free dairy products
Limit alcohol consumption	Limit alcohol to moderate amounts
Limit sodium intake	Limit sodium to less than 2,300 mg per day
Limit added sugars	Limit added sugars to less than 10% of calories
Limit saturated fats	Limit saturated fats to less than 10% of calories
Limit trans fats	Limit trans fats to less than 1% of calories

Table 2.3
Incorporating the Dietary Guidelines for Americans into Daily Life

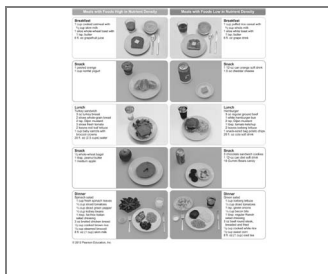


Figure 2.4
Comparing meals high in nutrient density to meals low in nutrient density.

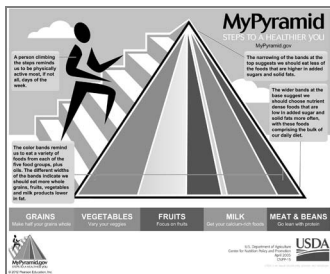


Figure 2.5
The USDA MyPyramid.

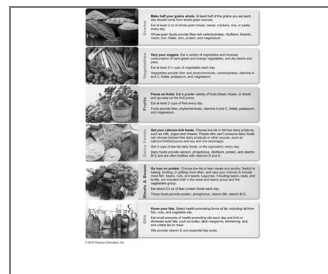


Figure 2.6
Food groups of the USDA Food Guide.

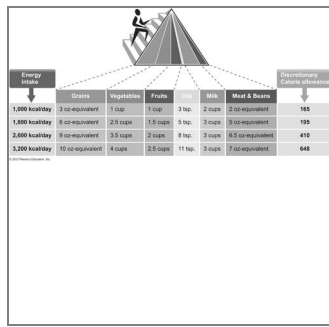


Figure 2.7
Sample diets from MyPyramid at four different energy intakes.

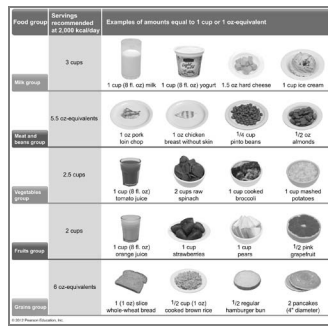


Figure 2.8
Example serving sizes for each MyPyramid food group for 2,000 kcals.

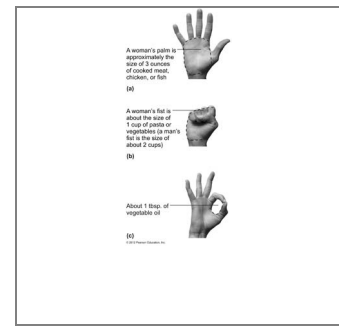


Figure 2.9
Using your hand to estimate food serving sizes.

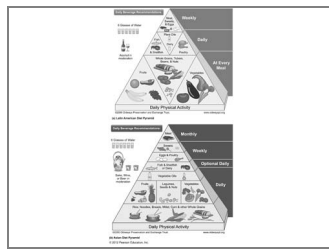


Figure 2.10
(a) The Latin American Diet Pyramid. (b) The Asian Diet Pyramid.

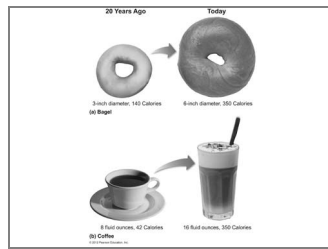


Figure 2.11
Examples of increases in food portion sizes over the past 20 years.

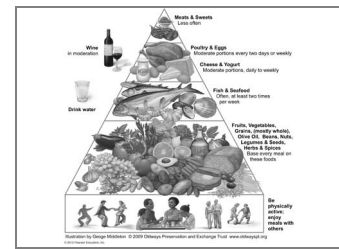


Figure 2.12
The Mediterranean Diet Pyramid.

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

- A. The hidden costs of eating out.
 1. Many restaurants serve large portions.
 2. Many meals are high in sodium and fat, as well as calories.
- B. The healthful way to eat out.
 1. Choose smaller portions.
 2. Avoid fried foods.
 3. Choose items with steamed vegetables.
 4. Avoid energy-rich appetizers and desserts.
 5. Eat less than half of the food you are served.
 - a. Quick Tips: Eating Right When You're Eating Out.

Additional Instructor Tools

PPT slides: 38–39

Figure and Tables

Menu Item	kcal	Fat (g)	Fat (% kcal)	Sodium (mg)
McDonald's				
Hamburger	250	9	32	520
Cheeseburger	300	12	37	750
Quarter Pounder	410	19	41	730
Quarter Pounder with Cheese	510	26	45	1,190
Big Mac	540	29	48	1,040
French fries, small	250	13	48	140
French fries, medium	380	20	47	220
French fries, large	570	30	47	330
Burger King				
Hamburger	260	16	38	520
Cheeseburger	310	20	42	740
Whopper	670	40	54	1,020
Double Whopper	920	58	57	1,090
Bacon Double Cheeseburger	510	30	53	1,160
French fries, small	340	17	47	530
French fries, medium	440	22	45	670
French fries, large	540	27	44	830

Table 2.4
Nutritional Value of Selected
Fast Foods

Item	Energy Density (kcal/g)
McDonald's Big Mac Hamburger French fries, extra large Big Mac Apple pie	~1.430 kcal
Subway 6 inch 6" sub Deli meat Deli meat, hot, with cheese sauce 1 cup (16 oz) 1 fresh medium apple	~610 kcal

Figure 2.13
Energy density of two fast
food meals.

Appetizers	Salads	Breads	Entrees	Fast	Beverages
Homemade soup	House salad, small portion	Whole-grain rolls	Steak, grilled, with vegetables and fresh vegetables	Low-fat yogurt	Fruit juice
Chicken wrap with vegetables	House salad, large portion	Corn tortillas	Grilled chicken, with vegetables and fresh vegetables	Low-fat milk	Fruit smoothie
Roast turkey and Swiss cheese sandwich	Apple or pear with cinnamon, low-sugar syrup, and walnuts	Whole wheat or quinoa-based bread	Grilled fish, with vegetables and fresh vegetables	Low-fat ice cream or yogurt	Low-fat yogurt

Table 2.5
Low-Fat Food Choices
Available in Restaurants

IV. Nutrition Debate: Can Functional Foods Improve Our Health?

- A. A functional food “provides a health benefit beyond basic nutrition.”
- B. Are functional foods safe?
 1. The FDA has no official definition or regulatory category for functional foods.
 2. The FDA is currently considering a new regulatory system for any product bearing health claims.
- C. Are functional foods effective?
 1. Yogurt and other fermented milk products contain probiotics.
 - a. Probiotics may be beneficial for some conditions in the GI tract.
 - b. To be effective, foods containing probiotics must provide an adequate number of bacteria, thought to be 1 to 10 billion.

V. In Depth: Phytochemicals

- A. What Are Phytochemicals?
 1. Phytochemicals are plant chemicals that protect plants.
 2. Phytochemicals are not considered nutrients, but have been shown to reduce the risk of many chronic diseases.
- B. How do phytochemicals reduce our risk of disease?
 1. Phytochemicals have antioxidant properties.
 2. Phytochemicals reduce inflammation.
 3. Phytochemicals enhance the activity of certain detoxifying enzymes.
 4. Phytochemicals slow tumor cell growth.
 5. Phytochemicals protect against infections.
 6. Phytochemicals reduce the risk of cardiovascular disease.
 7. Nutri-Case: Hannah.
- C. Is there an RDA for phytochemicals?
 1. Phytochemicals interact with each other to produce a synergistic effect.
 2. Phytochemicals interact with macronutrients, vitamins, and minerals.
 3. Phytochemicals can act in different ways under different circumstances in the body.

4. No recommendation for precise amounts of phytochemicals can be given; phytochemical supplements should be avoided.
5. Hot Topic: Will a PB&J Keep the Doctor Away?

Additional Instructor Tools

PPT slides: 40–42

Figure

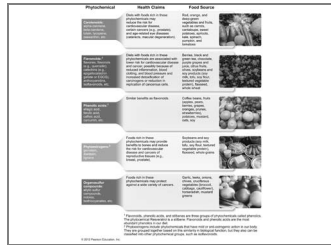


Figure 1
Health claims and food sources of phytochemicals.

Key Terms

adequate diet	healthful diet	ounce equivalent
balanced diet	metabolites	(oz-equivalent)
Dietary Guidelines for Americans	moderation	percent Daily Values (% DV)
discretionary calories	MyPyramid	phytochemicals
diseases of aging	nutrient density	variety
functional food	nutrient-dense foods	
	Nutrition Facts Panel	

In-Class Discussion Questions

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

7. Discuss some health-promoting functions of phytochemicals. Give specific examples of foods that can provide us with these chemicals.
8. Explain how antioxidants can lower the risk of many diseases of aging.

In-Class Activities

1. Students should use the food intake journal they previously completed to determine whether their intake conforms to the Dietary Guidelines. Refer to the inside front cover of the text for a summary of the Guidelines. Students should answer the following questions:
 - a. How many Dietary Guidelines do you meet?
 - b. How might you change your diet or lifestyle to more closely meet the recommendations?
2. Have students bring to class three food products that contain a food label. Instruct them to examine and discuss the ingredients list and the Nutrition Facts Panel in small groups. Have them answer the following questions for each label:
 - a. What is the ingredient present in the largest amount?
 - b. What is the serving size for the product?
 - c. Is the stated serving size the amount you would normally eat?
 - d. What is the number of calories per serving?
 - e. What is the amount of fat (in grams) per serving?
 - f. For each food product, discuss whether this would be considered a nutrient-dense food. Students should give reasons for their answer.
3. Have students visit a restaurant that provides nutrition facts for its meals. As an alternative, this information can be accessed online for many restaurants. Students should try to plan a healthful meal from the restaurant's menu. Discussion in class can address whether or not it was possible to find healthy options. Students should also state if they would order the healthy option if they were eating at this restaurant. Why or why not?
4. Have an "international feast" with groups of students using the variations of the previous USDA Food Guide Pyramid to plan the meals. Variations mentioned in the text include the African American Diet Pyramid, Latin American Diet Pyramid, Asian Diet Pyramid, Native American Pyramid, and Mediterranean Diet Pyramid.
5. MyPyramid is the most recent attempt by the USDA to promote a healthy diet and lifestyle. Although it has addressed some criticisms of the previous Food Guide Pyramid, experts have expressed concerns about this newest version, as well. Instruct students to read about the limitations of MyPyramid in Chapter 2 and identify some additional problems that they observe. Then, working in small groups, ask students to design a food guide of their own that they believe can improve on the current version. Have each group present their food guide to the class.
6. Have students work in groups and give them each one of the following meals to improve:
 - Breakfast: bagel and coffee
 - Lunch: cheese burger and diet soda
 - Dinner: pasta with sauce and diet soda

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

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

MyDiet Analysis Activity

8. Using the nutritional assessment previously completed, students should note the MyPyramid information provided by their diet analysis software and answer the following questions:
 - a. Do your intakes meet recommendations for each food group?
 - b. What food groups are you high in?
 - c. What food groups are you low in?
 - d. What changes can you make in your diet to more closely meet the recommendations of MyPyramid?

Nutrition Debate Activity

9. Have students do a Web search or a search in a supermarket for a “functional” food. Ask students to analyze whether or not they believe the health claim of the manufacturer is a valid one. Discuss in class what type of evidence is used to support the health claims for the various products.

Lecture Launcher Video Discussion Questions

These discussion questions are designed to promote critical thinking after viewing the following ABC News video clips.

Crackdown on Food Labels: Many Not as “Healthy” as Claimed?

1. Why did the FDA recently crack down on food manufacturers about information on food labels?
2. Why do you think food manufacturers include misleading information on food packaging?
3. What can you do as a consumer to ensure that you are buying healthy packaged foods?

Miscounting Calories: Surprising New Diet Food Report

1. What is a common misconception about the number of calories reported on the labels of some popular diet foods?
2. Why is more than one sample of a particular food tested to determine the correct calorie count?
3. Why does the FDA allow a wide range of labeling of calories on prepared foods?

“The Blue Zones” Sardinian Diet

1. What are the health benefits of eating the two types of traditional bread that are part of the Sardinian diet?
2. Why is it important to make meat a “side show”?
3. Why is eating cheese produced from grass-fed sheep more beneficial than cheese produced from other sources?

Web Resources

Main Chapter

www.fda.gov

U.S. Food and Drug Administration (FDA)

Learn more about the government agency that regulates our food and first established regulations for nutrition information on food labels.

www.nccam.nih.gov/health/probiotics

National Center for Complementary and Alternative Medicine

This brochure, called “An Introduction to Probiotics,” provides additional information on probiotics.

www.healthierus.gov/dietaryguidelines

Dietary Guidelines for Americans

Use these guidelines to make changes in your food choices and physical activity habits to help reduce your risk for chronic disease.

www.MyPyramid.gov

USDA MyPyramid Steps to a Healthier You

Use the MyPyramid Tracker on this Web site to assess the overall quality of your diet based on the USDA MyPyramid.

www.oldwayspt.org

Oldways Preservation and Exchange Trust

Find different variations of ethnic and cultural food pyramids.

<http://hp2010.nhlbihin.net/portion>

The National Institutes of Health (NIH) Portion Distortion Quiz

Take this fun quiz to see if you know how today’s food portions compare to those of 20 years ago.

www.eatright.org

The American Dietetic Association

Visit the food and nutrition information section of this Web site for additional resources to help you achieve a healthy lifestyle.

www.hsph.harvard.edu

The Harvard School of Public Health

Search this site to learn more about the Healthy Eating Pyramid, an alternative to the USDA Food Guide Pyramid.

In Depth: Phytochemicals

www.aicr.org

American Institute for Cancer Research

Search for “phytochemicals” to learn about the AICR’s stance and recommendations about phytochemicals and their roles in cancer prevention.

<http://lpi.oregonstate.edu>

Linus Pauling Institute

This extensive Web site covers not only phytochemicals but also nutrients and other cutting-edge health and nutrition topics.

Digital Transparency Masters

To enhance instruction in your class, we have provided the following transparency masters in PDF format on the Instructor Resource DVD for this chapter. This selection of images and tables can be downloaded and printed to create transparency acetates.

Figures: 2.1–2.13; In Depth FIGURE 1

Tables: 2.1–2.5