# *Understanding Nutrition 14th edition Whitney Solutions Manual*

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# Chapter 2 – Planning a Healthy Diet

## Learning Objectives

After completing Chapter 2, the student will be able to:

2.1 Explain how each of the diet-planning principles can be used to plan a healthy diet.
- a. List and apply the six principles of diet-planning.
- b. Apply the *2010 Dietary Guidelines for Americans* to promote health and prevent chronic disease.

2.2 Use the USDA Food Patterns to develop a meal plan within a specified energy allowance.
- a. Plan a balanced meal using the USDA Food Patterns.
- b. Identify foods that have a high nutrient density.
- c. Explain the uses of the exchange lists.
- d. Use the USDA Food Patterns to put a diet plan into action
- e. Apply the guidelines when shopping for groceries

2.3 Compare and contrast the information on food labels to make selections that meet specific dietary and health goals.
- a. Identify the information required on the food label.
- b. Identify the information required on the Nutrition Facts panel and calculate percent Daily Values.
- c. Recognize reliable health claims on food labels.

H2 Develop a well-balanced vegetarian meal plan.
- a. List the benefits of a vegetarian diet.
- b. Plan a balanced vegetarian diet using the USDA Food Patterns and MyPlate.

## Assignments and Other Instructional Materials

The following ready-to-use assignments are available in this chapter of the instructor's manual:
- **New!** Case Study 2-1: DASH on the Menu at a Quick-Serve Restaurant
- **Updated!** Case Study 2-2: Lacto-ovovegetarian Diet Planning
- Worksheet 2-1: Daily Calorie Evaluation[1]
- Worksheet 2-2: Compare Your Food Intake to Recommended Daily Amounts from Each Group
- Worksheet 2-3: Supermarket Worksheet
- Worksheet 2-4: Chapter 2 Crossword Puzzle[2]
- **Updated!** Worksheet 2-5: Interpreting Food Labels (Internet Exercise)
- Critical thinking questions with answers
- **New!** Key Terms and Definitions

Other instructional materials in this chapter of the instructor's manual include:
- Answer key for How To activities and study card questions
- Classroom activities, featuring meal comparison activity (2-13)
- Worksheet answer keys (as appropriate)
- Handout 2-1: Health Claims and Structure-Function Claims

Visit the book's instructor companion website to download:
- Handout 2-2: *Dietary Guidelines for Americans*, 1990 to 2010
- Handout 2-3: A World Tour of Dietary Guidelines[3]
- Handout 2-4: Healthy Eating Index (HEI-2005) Components

[1] Worksheets 2-1, 2-2, and 2-5 contributed by Daryle Wane.

[2] Contributed by Carrie King.

[3] Handouts 2-1 and 2-3 contributed by Sharon Rady Rolfes.

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## Glossary

### Chapter Key Terms

- **added sugars:** sugars and other kcaloric sweeteners that are added to foods during processing, preparation, or at the table. Added sugars do not include the naturally occurring sugars found in fruits and milk products.
- **adequacy** (dietary): providing all the essential nutrients, fiber, and energy in amounts sufficient to maintain health.
- **balance** (dietary): providing foods in proportion to one another and in proportion to the body's needs.
- **Daily Values** (DV): reference values developed by the FDA specifically for use on food labels.
- **discretionary kcalories:** the kcalories remaining in a person's energy allowance after consuming enough nutrient-dense foods to meet all nutrient needs for a day.
- **eating pattern:** customary intake of foods and beverages over time.
- **empty-kcalorie foods:** a popular term used to denote foods that contribute energy but lack protein, vitamins, and minerals.
- **enriched:** the addition to a food of specific nutrients to replace losses that occur during processing so that the food will meet a specified standard.
- **exchange lists:** diet-planning tools that organize foods by their proportions of carbohydrate, fat, and protein. Foods on any single list can be used interchangeably.
- **food group plans:** diet-planning tools that sort foods into groups based on nutrient content and then specify that people should eat certain amounts of foods from each group.
- **food substitutes:** foods that are designed to replace other foods.
- **fortified:** the addition to a food of nutrients that were either not originally present or present in insignificant amounts. Fortification can be used to correct or prevent a widespread nutrient deficiency or to balance the total nutrient profile of a food.
- **health claims:** statements that characterize the relationship between a nutrient or other substance in a food and a disease or health-related condition.
- **Healthy Eating Index:** a measure that assesses how well a diet meets the recommendations of the *Dietary Guidelines for Americans.*
- **imitation foods:** foods that substitute for and resemble another food, but are nutritionally inferior to it with respect to vitamin, mineral, or protein content. If the substitute is not inferior to the food it resembles and if its name provides an accurate description of the product, it need not be labeled "imitation."
- **kcalorie** (energy) **control:** management of food energy intake.
- **legumes** (lay-GYOOMS or LEG yooms): plants of the bean and pea family, with seeds that are rich in protein compared with other plant-derived foods.
- **moderation** (dietary): providing enough but not too much of a substance.
- **nutrient claims:** statements that characterize the quantity of a nutrient in a food.
- **nutrient density:** a measure of the nutrients a food provides relative to the energy it provides. The more nutrients and the fewer kcalories, the higher the nutrient density.
- **nutrient profiling:** ranking foods based on their nutrient composition.
- **percent Daily Value** (%DV): the percentage of a Daily Value recommendation found in a specified serving of food for key nutrients based on a 2000-kcalorie diet.
- **portion sizes:** the quantity of a food served or eaten at one meal or snack; *not* a standard amount.
- **processed foods:** foods that have been treated to change their physical, chemical, microbiological, or sensory properties.
- **refined:** the process by which the coarse parts of a food are removed. When wheat is refined into flour, the bran, germ, and husk are removed, leaving only the endosperm.
- **serving sizes:** the standardized quantity of a food; such information allows comparisons when reading food labels and consistency when following the *Dietary Guidelines*.
- **solid fats:** fats that are not usually liquid at room temperature; commonly found in most foods derived from animals and vegetable oils that have been hydrogenated. Solid fats typically contain more saturated and *trans* fats than most oils (Chapter 5 provides more details).
- **structure-function claims:** statements that characterize the relationship between a nutrient or other substance in a food and its role in the body.
- **textured vegetable protein:** processed soybean protein used in vegetarian products such as soy burgers.

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- **variety** (dietary): eating a wide selection of foods within and among the major food groups.
- **whole grain:** a grain that maintains the same relative proportions of starchy endosperm, germ, and bran as the original (all but the husk); not refined.

**Terms on Food Labels**

***General Terms***

- **free**: "nutritionally trivial" and unlikely to have a physiological consequence; synonyms include without, no, and zero. A food that does not contain a nutrient naturally may make such a claim, but only as it applies to all similar foods (for example, "applesauce, a fat-free food").
- **gluten-free**: a food that contains less than 20 parts per million of gluten from any source; synonyms include no gluten, free of gluten, or without gluten.
- **good source of**: the product provides between 10 and 19 percent of the Daily Value for a given nutrient per serving.
- **healthy**: a food that is low in fat, saturated fat, cholesterol, and sodium and that contains at least 10 percent of the Daily Values for vitamin A, vitamin C, iron, calcium, protein, or fiber.
- **high**: 20 percent or more of the Daily Value for a given nutrient per serving; synonyms include rich in or excellent source.
- **less**: at least 25 percent less of a given nutrient or kcalories than the comparison food (see individual nutrients); synonyms include fewer and reduced.
- **light** or **lite**: one-third fewer kcalories than the comparison food; 50 percent or less of the fat or sodium than the comparison food; any use of the term other than as defined must specify what it is referring to (for example, "light in color" or "light in texture").
- **low:** an amount that would allow frequent consumption of a food without exceeding the Daily Value for the nutrient. A food that is naturally low in a nutrient may make such a claim, but only as it applies to all similar foods (for example, "fresh cauliflower, a low sodium food"); synonyms include little, few, and low source of.
- **more**: at least 10 percent more of the Daily Value for a given nutrient than the comparison food; synonyms include added and extra.
- **organic**: on food labels, that at least 95 percent of the product's ingredients have been grown and processed according to USDA regulations defining the use of fertilizers, herbicides, insecticides, fungicides, preservatives, and other chemical ingredients (see Chapter 19).

***Energy***

- **kcalorie-free**: fewer than 5 kcalories per serving.
- **low kcalorie**: 40 kcalories or less per serving.
- **reduced kcalorie**: at least 25 percent fewer kcalories per serving than the comparison food.

***Fat and Cholesterol***

- **percent fat-free**: may be used only if the product meets the definition of low fat or fat-free and must reflect the amount of fat in 100 grams (for example, a food that contains 2.5 grams of fat per 50 grams can claim to be "95 percent fat-free").
- **fat-free**: less than 0.5 gram of fat per serving (and no added fat or oil); synonyms include zero-fat, no-fat, and nonfat.
- **low fat**: 3 grams or less of fat per serving.
- **less fat**: 25 percent or less of fat than the comparison food.
- **saturated fat-free**: less than 0.5 gram of saturated fat and 0.5 gram of trans fat per serving.
- **low saturated fat**: 1 gram or less of saturated fat and less than 0.5 gram of trans fat per serving.
- **less saturated fat**: 25 percent or less of saturated fat and trans fat combined than the comparison food.
- **trans fat-free**: less than 0.5 gram of trans fat and less than 0.5 gram of saturated fat per serving.
- **cholesterol-free**: less than 2 milligrams of cholesterol per serving and 2 grams or less of saturated fat and trans fat combined per serving.
- **low cholesterol:** 20 milligrams or less of cholesterol per serving and 2 grams or less of saturated fat and trans fat combined per serving.
- **less cholesterol:** 25 percent or less cholesterol than the comparison food (reflecting a reduction of at least 20 milligrams per serving), and 2 grams or less of saturated fat and trans fat combined per serving.

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- **extra lean:** less than 5 grams of fat, 2 grams of saturated fat and trans fat combined, and 95 milligrams of cholesterol per serving and per 100 grams of meat, poultry, and seafood.
- **lean**: less than 10 grams of fat, 4.5 grams of saturated fat and trans fat combined, and 95 milligrams of cholesterol per serving and per 100 grams of meat, poultry, and seafood. For mixed dishes such as burritos and sandwiches, less than 8 grams of fat, 3.5 grams of saturated fat, and 80 milligrams of cholesterol per reference amount customarily consumed.

***Carbohydrates: Fiber and Sugar***

- **high fiber**: 5 grams or more of fiber per serving. A high-fiber claim made on a food that contains more than 3 grams of fat per serving and per 100 grams of food must also declare total fat.
- **sugar-free**: less than 0.5 gram of sugar per serving.

***Sodium***

- **sodium-free** and **salt-free:** less than 5 milligrams of sodium per serving.
- **low sodium:** 140 milligrams or less per serving.
- **very low sodium:** 35 milligrams or less per serving.

**Highlight Terms**

- **lactovegetarian diet:** an eating pattern that includes milk and milk products, but excludes meat, poultry, seafood, and eggs from the diets.
  - **lacto** = milk
- **lacto-ovo-vegetarian diet:** an eating pattern that includes milk, milk products, and eggs, but excludes meat, poultry, and seafood from the diet.
  - **ovo** = egg
- **macrobiotic diet:** a philosophical eating pattern based on mostly plant foods such as whole grains, legumes, and vegetables, with small amounts of fish, fruits, nuts, and seeds.
  - **macro** = large, great
  - **biotic** = life
- **meat replacements:** products formulated to look and taste like meat, seafood, or poultry; usually made of textured vegetable protein.
- **omnivorous:** an eating pattern that includes foods derived from both animals and plants.
  - **omni** = all
  - **vores** = to eat
- **plant-based diets:** an eating pattern that derives most of its protein from plant products (although some animal products may be included).
- **tempeh** (TEM-pay): a fermented soybean food, rich in protein and fiber.
- **tofu** (TOE-foo): a curd made from soybeans, rich in protein and often fortified with calcium; used in many Asian and vegetarian dishes in place of meat.
- **vegan** (VEE-gan) **diet:** an eating pattern that excludes all animal-derived foods (including meat, poultry, fish, eggs, and dairy products); also called *pure vegetarian, strict vegetarian*, or *total vegetarian.*
- **vegetarian diet:** a general term used to describe an eating pattern that excludes meat, poultry, fish, or other animal-derived foods from the diet.

## Lecture Presentation Outline

**Key to instructor resource annotations (shown to the right of or below outline topics):**
Website = Available for download from book companion website: HN = student handout
IM = Included in this instructor's manual: CS = case study, WS = worksheet, CA = classroom activity

| *Introductory/whole chapter resources:* Test Bank; IM WS 2-4, CA 2-11 |
|---|

I. Principles and Guidelines – Address the factors that influence an individual's eating pattern.

A. Diet-Planning Principles – Discuss the principles of:
1. Adequacy
2. Balance

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3. kCalorie control
4. Nutrient density (Figure 2-1)
   a. Empty kcalories
   b. Nutrition profiling
5. Moderation
6. Variety

B. *Dietary Guidelines for Americans* – Discuss the key recommendations for 2010 including:

Website HN 2-2, CA 2-4

1. Balancing kcalories to manage weight
   a. Improving eating and activity patterns
   b. Controlling kcalorie intake
   c. Increasing physical activity
2. Foods and food components that should be reduced including:
   a. Sodium
   b. Saturated fatty acids (e.g., from solid fats)
   c. Dietary cholesterol
   d. *Trans* fatty acids (e.g., from solid fats)
   e. Added sugars
   f. Refined grains
   g. Alcohol
3. Foods and nutrients that should be consumed including:
   a. Fruits and vegetables
   b. Whole grains
   c. Fat-free or low-fat dairy products
   d. Lean proteins
   e. Seafood
   f. Oils in place of solid fats
   g. Foods containing potassium, dietary fiber, calcium, and vitamin D
4. Building healthy eating patterns
   a. Should meet nutrient needs
   b. Consider how all foods and beverages fit into an individual's eating pattern
   c. Prepare food safely

II. Diet-Planning Guides

Website HN 2-3

A. USDA Food Patterns (Figure 2-2)
   1. Recommended Amounts – Discuss the recommended amounts for each food group including:
      a. Recommendations depend upon how many kcalories are required
      b. The five subgroups of vegetables (dark green, red/orange, legumes, starchy, other)
      c. The importance of varying vegetable choices
      d. The three subgroups of protein foods (seafood, meats/poultry/eggs, nuts/seeds/soy products)
   2. Notable Nutrients – Explain the notable nutrients including:
      a. How each group contributes key nutrients
      b. How the food groups allow for food substitutions
      c. That legumes may be considered a vegetable or a meat alternative
      d. How the typical American diet requires an increased intake of vegetables, fruits, whole grains, seafood, and milk and a decrease in sodium, saturated fat, *trans* fat, cholesterol, and refined grains
   3. Nutrient-Dense Choices – Describe how individuals can make nutrient-dense choices IM CA 2-3
   4. Discretionary kCalories – Define discretionary kcalories and how they are calculated (Figure 2-3)
   5. Serving Equivalents – Discuss serving equivalents including: IM CA 2-5
      a. How cups are used to measure servings of fruits, vegetables, and milk
      b. How ounces are used to measure servings of grains and meats
      c. How visualization can be used to estimate portion sizes

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6. Ethnic Food Choices – Discuss ethic food choices including: IM CA 2-2
   a. Asian examples
   b. Mediterranean examples
   c. Mexican examples
7. Vegetarian Food Guide – Explain the vegetarian food guide including:
   a. Reliance on plant foods such as grains, vegetables, legumes, fruits, nuts, and seeds
   b. Similar food groups and serving sizes
8. Mixtures of Foods – Explain how foods can fall into two or more food groups
9. MyPlate – Discuss MyPlate and how it is an educational tool created by the USDA to remind consumers to make healthy choices (Figure 2-4) Website HN 2-4, CA 2-7, 2-8
   a. Plate is divided into 4 sections
   b. Circle next to the plate represents the milk group
   c. Web site www.choosemyplate.gov can be used to individualize the plan
10. Recommendations vs. Actual Intakes – Explain the differences between recommendations and actual intakes (Figure 2-5)
    a. Most consumers do not choose nutrient-dense foods
    b. The Healthy Eating Index measures how well an individual's diet meets the *Dietary Guidelines*
11. MyPlate Shortcomings – Discuss MyPlate shortcomings including how the plan:
    a. Fails to provide enough information
    b. Is dependent upon a website for consumer information
    c. Does not distinguish between healthy and unhealthy options within food groups

B. Exchange Lists – Explain how exchange lists help to achieve kcalorie control and moderation:
   1. Foods are sorted by energy-nutrient content
   2. Originally developed for those with diabetes
   3. Portion sizes vary within a group
   4. Food groupings may not be logical

C. Putting the Plan into Action – Discuss how putting the plan into action can be accomplished IM CS 2-1, 2-2, WS 2-1, 2-2, CA 2-6

D. From Guidelines to Groceries IM WS 2-3, CA 2-10
   1. Grains – Discuss the differences among the grains including: (Figure 2-6)
      a. Refined
      b. Enriched
      c. Whole-grain (Figure 2-7)
      d. Fortified
   2. Vegetables – Explain the best methods for choosing vegetables including: IM CA 2-1
      a. Choosing fresh vegetables often
      b. The importance of dark green leafy and yellow-orange vegetables
      c. How they are good sources of vitamins, minerals, and fiber
      d. How to avoid added fat and salt
      e. How and why to choose legumes (Figure 2-8)
   3. Fruit – Discuss the importance of fruit including how:
      a. To choose fresh fruits often
      b. Processed fruits are acceptable alternatives to fresh
      c. Fruit provides vitamins, minerals, fibers, and phytochemicals
      d. Fruit juices lack fiber but are healthy beverages
      e. To watch energy intakes and fruit "drinks" or "ades"
   4. Protein Foods – Address how to choose healthy sources of protein including:
      a. Choosing lean cuts
      b. Using textured vegetable protein in recipes
      c. Weighing to determine portion sizes
      d. Using low-fat cooking methods
   5. Milk and Milk Products – Discuss choosing healthy milk (or soy milk) and milk products
      a. Imitation foods and food substitutes appear in milk and milk products
      b. Lower-fat dairy products are available

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III. Food Labels – Explain the following areas of the food label: IM WS 2-5, CA 2-9

A. The Ingredient List
   1. All ingredients listed
   2. Descending order of predominance by weight
B. Nutrition Facts panel (Figure 2-9)
   1. Serving sizes
   2. Nutrient quantities
   3. The Daily Values
   4. Front-of-Package Labels (Figure 2-10)
C. Claims on Labels
   1. Nutrient claims
   2. Health claims
   3. Structure-function claims (Figure 2-11)
D. Consumer Education
   1. FDA education program

IV. Highlight: Vegetarian Diets

A. Health Benefits of Vegetarian Diets – Discuss the health benefits of vegetarian diets including:
   1. Obesity – Lower rates of obesity
   2. Diabetes – Protection against diabetes
   3. Hypertension – Lowering of blood pressure
   4. Heart Disease – Lower rates of heart disease
   5. Cancer – Decreased risk of certain types of cancer
   6. Other Diseases – Impact on osteoporosis, diverticular disease, gallstones, cataracts, and rheumatoid arthritis
B. Vegetarian Diet Planning IM CA 2-12
   1. Vegans
      a. Legumes, nuts, and seeds can be used as protein sources
      b. Soy, rice, almond, or oat milk can be used in place of cow's milk (Figure H2-1)
   2. Protein
      a. Lacto-ovo-vegetarians consume animal-derived products and thus high-quality protein
      b. Meat replacements and textured vegetable protein can be used
   3. Iron - Iron-rich vegetables and fortified grain products consumed with foods that are high in vitamin C can help vegetarians meet iron needs
   4. Zinc - Consuming legumes, whole grains, and nuts can provide zinc to those who do not consume meat
   5. Calcium
      a. Calcium is not an issue for the lactovegetarian
      b. Calcium-rich foods should be consumed
   6. Vitamin $B_{12}$
      a. Vegans unlikely to receive enough $B_{12}$ from the diet
      b. Consumption of fortified products or supplementation is necessary for vegans
   7. Vitamin D can come from sunlight exposure or fortified foods
   8. Omega-3 Fatty Acids - Food sources include flaxseed, walnuts, soybeans, and their oils
C. Healthy Food Choices
   1. Balance is important
   2. Diet and other lifestyle habits need to be healthy

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## Case Studies

### Case Study 2-1: DASH on the Menu at a Quick-Serve Restaurant

Charles C. is a 65-year-old executive who is very overweight and has recently been diagnosed with high blood pressure. He has just completed a class on the principles of the DASH (Dietary Approaches to Stop Hypertension) diet and has set a goal to lower his intake of fat and sodium and to increase his intake of calcium and potassium-rich foods. Mr. C. has met a friend for lunch at his favorite restaurant that features pizza, salads, soups, and sandwiches.

1. Mr. C. freely admits he enjoys food; lots of food, and mostly rich food, not necessarily "healthy" food. His lunch companion assures him that he can still enjoy food, but just needs to pick foods that deliver the most nutrients for the fewest kcalories. Such foods are termed
   a. nutritionally adequate.
   b. balanced.
   c. nutrient dense.
   d. homeostatic.
   e. glycemic controlling.

2. Mr. C.'s friend points out that there is a very large salad bar with all sorts of foods and suggests that Mr. C. have that. Given his history, which of the following would be the most problematic for Mr. C. if he selects the salad bar?
   a. Variety
   b. Adequacy
   c. Balance
   d. Moderation
   e. Density

3. Mr. C. looks at the fruits, vegetables, toppings, and dressings on the salad bar and wonders which contain which nutrients. Which would provide him with the most potassium?
   a. macaroni salad
   b. white rice
   c. dried apricots
   d. olives
   e. canola oil

4. Mr. C. realizes that if he is going to eat from the salad bar, he will have to estimate portion sizes, and he is not sure what a serving size would be for the various fruits and vegetables. Suppose he is on a 1800 kcalorie diet. What would the serving size be for fresh fruit?
   a. ½ cup
   b. 1 cup
   c. 1 ½ cup
   d. 2 cups
   e. 2 ½ cups

5. How much protein, per day, should Mr. C. consume on his 1800 kcalorie diet?
   a. 2 ounces
   b. 3 ounces
   c. 4 ounces
   d. 5 ounces
   e. 6 ounces

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6. Mr. C decides that the salad bar is probably too tempting, so he looks at the pizza selections. He notices that the "Vegetarian Delight" pizza is made with TVP "sausage." What is TVP made from?
   a. lentils
   b. wheat
   c. mushrooms
   d. casein
   e. soy

7. Mr. C.'s friend points out to him that the restaurant has nutritional information for each selection on the menu, so he asks the wait staff to bring the special menu with the additional details. If the nutrition information on the menu uses the same principles as the nutrition information on food labels, Mr. C. can be certain that
   a. the percent Daily Value for sodium, calcium, potassium, magnesium, and iron will be listed.
   b. saturated, unsaturated, and trans fats amounts will be listed separately.
   c. serving size will not be specified, since USDA serving sizes are assumed.
   d. all ingredients will be listed in descending order of predominance by weight.
   e. carbohydrates will be broken down into simple and complex carbs.

**Answer Key**

1. c
2. d
3. c
4. c
5. d
6. e
7. d

**Case Study 2-2: Lacto-ovovegetarian Diet Planning**

Sarah T. is a 20-year-old college student who does not eat meat, fish, or poultry. She is 5 feet 7 inches tall, weighs 140 pounds, and is physically active most days, riding her bike to school from her apartment off campus. Although her weight has been stable for the past year, Sarah's mother is concerned she is not getting the nutrients she needs for optimal health. Sarah's usual daily diet includes a toaster pastry and juice for breakfast, peanut butter sandwich for lunch, and pasta or vegetable pizza for dinner. She snacks frequently on chips or cookies and drinks one or two diet sodas each day.

1. Using the glossary in Highlight 2 of this chapter, how would you categorize Sarah's diet?
2. What key nutrients are likely to be inadequate in Sarah's current diet?
3. What changes or additions to her diet would you recommend to include sources of these nutrients?
4. What is a reasonable estimate of Sarah's daily kcalorie needs? Based on this estimate, what is the daily amount of protein foods (in ounces) that you would recommend for Sarah?
5. Using Table H2-1 as your guide, set up a 7-day plan to show how Sarah can meet her recommended daily protein needs.

**Answer Key**

1. Lacto-ovo vegetarian.
2. Protein, iron, zinc, calcium, vitamin $B_{12}$, vitamin D, and omega-3 fatty acids.
3. Answers will vary, but should be consistent with recommendations in Table H2-2.
4. Estimated daily kcalorie needs (Table 2-3): 2400. Daily protein foods amount: 6 ½ ounces (Table H2-1).
5. Answers will vary but should include eggs, legumes, dairy, nuts, or seeds in recommended amounts for a 2400-kcalorie diet. I.e., the sample plan should provide 6 ½ ounce equivalents of protein foods each day, to total 5 oz.

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eggs, 11 oz. legumes, 14 oz. soy products, and 16 oz. nuts and seeds over the 7 days; as well as 3 cup equivalents of dairy products per day.

## Suggested Classroom Activities

The material presented in this chapter provides a great opportunity for classroom discussion. Applying the principles presented in meal planning can be a valuable teaching tool.

**Classroom Activity 2-1: Exotic Fruit and Vegetable Tasting**[4]
Key concepts: Identification of healthy foods, food habits Class size: Any
Materials needed: Assorted fruits/vegetables, cut into small pieces; information about cultivation of these foods
Instructions: Offer bite-size samples of common and unusual fruits and vegetables. You may include kiwi, star fruit, and other less common selections. Set up a display featuring information about where the foods are grown and how they are prepared.

**Classroom Activity 2-2: An International Luncheon**[5]
Key concept: Cultural influences on food habits Class size: Any
Instructions: Try an international luncheon to teach students about food habits of populations outside the United States. Have students research the food habits of a foreign country of particular interest to them and present an oral report to the class. In addition, students should bring a food prepared at home to a potluck luncheon. This activity introduces native foods and traditional customs of countries around the world. Everyone is encouraged to sample all foods.

**Classroom Activity 2-3: Discuss Nutrient Density**
Key concept: Nutrient density Class size: Any
Instructions: Reinforce the concept of nutrient density by comparing selected nutrients in amounts of orange juice and oranges providing equal kcalories. There is considerably more fiber, calcium, vitamin C, and riboflavin in oranges than in orange juice.

| | | | | | |
|---|---|---|---|---|---|
| 200 g orange: | 98 kcal | 4.4 g fiber | 86 mg Ca | 118.2 mg vitamin C | 0.102 mg riboflavin |
| 200 g juice: | 98 kcal | 0.6 g fiber | 22 mg Ca | 67.2 mg vitamin C | 0.078 mg riboflavin |

**Classroom Activity 2-4: A Nutrition Fair to Promote the *Dietary Guidelines***[6]
Key concepts: application of *Dietary Guidelines for Americans*, USDA Food Patterns, and MyPlate system
Class size: Any
Materials needed: Tables/chairs for booths, large public space in which to present the "fair"
Instructions: Most effective nutrition educational presentations are those that involve active participation. According to Confucius: "I hear and I forget, I see and I remember, I do and I understand." Have students develop a nutrition fair using the *Dietary Guidelines* as a theme. Select a date and location and instruct students to organize activities and materials for different booths that teach each guideline. Each booth must have an activity. Some suggestions for activities include: an exercise quiz, a healthy eating quiz board, a MyPlate puzzle, an alcohol trivia quiz, and a saturated or *trans* fat reduction program. This activity is beneficial in that it incorporates active participation, self-assessment, and intention to change.

**Classroom Activity 2-5: Estimation of Food Portions and Serving Sizes**[7]
Key concept: Estimation of portion sizes Class size: Any
Materials needed: Pre-measured portions of assorted foods; bowls, cups, and plates of various sizes

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[4] Activity provided by: Preventure: Innovative Health Solutions

[5] Activity provided by: Ruth Thornley of West Shore Community College

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

[7] Activity provided by: Caroline Roberts, Nutrition Education Specialist, California Department of Education, and Instructor, Sierra College, Rocklin

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Instructions: Students often have difficulty with accurately estimating portion sizes of foods. To overcome this, have students estimate actual food portions in class. Bring pre-measured portions of commonly consumed foods and various-sized bowls, cups, plates, etc. Examples of foods to bring: cooked beef patty, salad, various vegetables, pasta, rice, ready-to-eat cereal, chips, popcorn, margarine, peanut butter, jam. Place these around the room and have students walk around the room and try to estimate the portion sizes. At the same time, discuss how to record food portions, i.e. ounces versus cups, weight versus volume, etc. Then discuss the portion sizes.

Since so many students lack education in food preparation or practical cooking experience, this activity seems to help them estimate portions more accurately.

**Classroom Activity 2-6: Compare Your Food Intake to Recommended Daily Amounts of Each Food Group**
Key concepts: Estimation of portion sizes; food groups Class size: Any
Materials needed: 1 copy of Worksheet 2-3 per student
Instructions: Provide students with a copy of Worksheet 2-3. Instruct them to calculate their estimated energy requirement (EER). Instruct them to record everything they ate on the previous day, including beverages and snacks. Assist them with estimating food portions and translating their food selections into food groups. Have them complete their total food group intakes for the entire day and compare this to the recommended daily amounts of each food group based on their EER (see text Table 2-3 for recommendations). Discuss ways that they can improve their dietary habits.

**Classroom Activity 2-7: Using ChooseMyPlate.gov**
Key concept: Application of diet planning principles using a food group eating plan
Class size: Any
Instructions: Instruct students to go online to ChooseMyPlate.gov. Have them enter their age, gender, and activity level and receive their recommended kcalorie intake and food group intakes. Instruct them to access the meal tracking section and use the form to monitor their food intake for 1 to 3 days. You may instruct them to write a 1-2 page discussion regarding what they learned about their food behaviors and any changes they intend to make.

**Classroom Activity 2-8: MyPlate Jeopardy![8]**
Key concepts: Food groups from MyPlate/the USDA Food Patterns
Class size: Any
Materials needed: Jeopardy! game board; cards with questions prepared by instructor
Instructions: Create a Jeopardy! game board with six category columns. Each column should have a category name (i.e. grains, empty kcalories, etc.). Under each category name have 5 game cards, each with a different question that is relevant to the particular category of interest. Have the game cards increase in "point" value. Each game card should contain an answer. The students are required to state their answer in the form of a question. If this process is too involved for your class, you can write the questions on the cards and allow the students to provide the simple answer. This activity can be conducted in large classes in which teams compete or in small groups. This activity can also be adapted for other nutrition, wellness, and activity topics. It creates an atmosphere for application and fun!

**Classroom Activity 2-9: Label Analysis[9]**
Key concept: Reading/interpreting food labels Class size: Any
Instructions: Have students bring in boxes, cans, or any package with a label. Examine and discuss the Nutrition Facts panel and ingredients. This activity helps students become more aware of the terms on labels. For example, on the label for Breyers Mint Chocolate Chip Double Churned ice cream, the ingredients are:

> Milk, skim milk, sugar, chocolate flavored chips (sugar, coconut oil, cocoa (processed with alkali), milk fat, soy lecithin (as an emulsifier), natural flavor), cream, corn syrup, natural flavor, cellulose gel, mono & diglycerides, guar gum, carob bean gum, cellulose gum, carrageenan, vitamin A palmitate.

You can talk about guar gum being made up of non-ionic polydisperse rod-shaped polymers. Guar gum is an economical thickener and stabilizer.

[8] Activity provided by: Don Simpson, University of Arkansas, Fayetteville

[9] Activity provided by: Pat Rogers, Allan Hancock College

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When students bring in the labels, they usually become more involved in learning. Also, many times they bring in new products that the instructor may not have seen yet, which facilitates learning for the instructor as well as the student.

**Classroom Activity 2-10: Discuss How Advertisements Influence Food Choices**
Key concept: Media influences on food habits Class size: any
Instructions: The campaign to enhance the public image of milk (Got Milk, the milk mustache) is an example of a successful image campaign. Encourage students to name other food campaigns and discuss their nutrition merits.

**Classroom Activity 2-11: Newspaper Articles[10]**
Key concept: Evaluation of nutrition information from the media Class size: Any
Instructions: Have students collect current newspaper articles about nutrition and post them on the classroom bulletin board. This activity encourages discussion of current nutrition topics, which helps bring the lectures and readings into the students' lives.

**Classroom Activity 2-12: Vegetarian Meal Planning (Meal Comparison)[11]**
Key concept: Vegetarian diet planning Class size: Any
Instructions: Present the three vegetarian meal plans below to students and use the discussion questions to prompt them to evaluate the plans.

| ***Lacto-ovo-vegetarian*** | ***Lactovegetarian*** | ***Vegan*** |
|---|---|---|
| Black-eyed pea & lentil soup, 1 cup | Black-eyed pea & lentil soup, 1 cup | Black-eyed pea & lentil soup, 1 cup |
| Hard-boiled egg, 1 | Walnuts, 1 oz | Walnuts, 1 oz |
| Dinner roll, whole-wheat, 1 roll | Dinner roll, whole-wheat, 1 roll | Dinner roll, whole-wheat, 1 roll |
| Fresh orange, 1 medium | Fresh orange, 1 medium | Fresh orange, 1 medium |
| Spinach, steamed, ½ cup | Spinach, steamed, ½ cup | Spinach, steamed, ½ cup |
| 1% milk, 1 cup | 1% milk, 1 cup | Soy milk, original, 1 cup (fortified) |

***Discussion questions:***
1. What are the DRIs for a 25-year-old male for iron, zinc, vitamin $B_{12}$, and vitamin D? (Hint: Use the chart inside the front cover of your textbook and see chapter 13 for special considerations for iron for vegetarians.)
2. For which meal plan would it be the most challenging to meet vitamin $B_{12}$ requirements? Why?
3. What other foods could be included in the vegetarian meal plans to meet the weekly recommendation of 7-11 grams of omega-3 fatty acids each **week**?
4. What food items in the meal plans are supplying the most iron?
5. What other foods could the meal plans include to increase the vitamin D content?

Answer key:
1. Iron: (DRI for males [8 mg] × 1.8) = 14.4 mg Zinc: 9.4 mg Vitamin $B_{12}$: 2.0 µg
   Vitamin D: 600 IU (vitamin D: 15 micrograms/day × [1 microgram cholecalciferol = 40 IU vitamin D] = 600 IU)
2. Vegan diet meal plan because there are no animal-based foods included in vegan diets.
3. Answers will vary. Possible answers include: flax seeds, soybeans, tofu, and products (e.g., soy milk) fortified with omega-3 fats such as algae-derived DHA.
4. Lentils, black-eyed peas, and spinach.
5. Fortified cereals, juices, or yogurt.

Nutrient composition of meals for instructor reference:

| **Lacto-ovo-vegetarian Menu Item** | **Cal** | **Pro** | **Fe** | **Zinc** | **$B_{12}$** | **Vit D** | **Ω 3** |
|---|---|---|---|---|---|---|---|
| Black-eyed pea and lentil soup, 1 cup | 157 | 11 | 3.9 | 1.78 | 0 | 0 | 0 |
| Hard-boiled egg, 1 | 78 | 6.3 | 0.60 | 0.52 | 0.56 | 44 | 0.5 |
| Dinner roll, whole-wheat, 1 roll | 74 | 2.4 | 0.68 | 0.56 | 0 | 0 | 0 |
| Fresh orange, 1 medium | 69 | 1.3 | 0.18 | 0.11 | 0 | 0 | 0 |

[10] Activity provided by: Cathy M. Pippin of Northeast Mississippi Junior College

[11] Contributed by Carrie King

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| Lacto-ovo-vegetarian Menu Item | Cal | Pro | Fe | Zinc | $B_{12}$ | Vit D | Ω 3 |
|---|---|---|---|---|---|---|---|
| Spinach, steamed, ½ cup | 20 | 2.7 | 3.2 | 0.69 | 0 | 0 | 0.1 |
| 1% milk, 1 cup | 102 | 8 | 0.07 | 1.02 | 1.15 | 117 | 0 |
| **Totals** | 500 | 31.7 | 8.63 | 4.68 | 1.71 | 161 | 0.6 |

| Lactovegetarian Menu Item | Cal | Pro | Fe | Zinc | $B_{12}$ | Vit D | Ω 3 |
|---|---|---|---|---|---|---|---|
| Black-eyed pea and lentil soup, 1 cup | 157 | 11 | 3.9 | 1.78 | 0 | 0 | 0 |
| Walnuts, 1 oz | 185 | 4.3 | 0.8 | 0.85 | 0 | 0 | 2.6 |
| Dinner roll, whole-wheat, 1 roll | 74 | 2.4 | 0.68 | 0.56 | 0 | 0 | 0 |
| Fresh orange, 1 medium | 69 | 1.3 | 0.18 | 0.11 | 0 | 0 | 0 |
| Spinach, steamed, ½ cup | 20 | 2.7 | 3.2 | 0.69 | 0 | 0 | 0.1 |
| 1% milk, 1 cup | 102 | 8 | 0.07 | 1.02 | 1.15 | 117 | 0 |
| **Totals** | 607 | 29.7 | 8.83 | 5.01 | 1.15 | 117 | 2.7 |

| Vegan Menu Item | Cal | Pro | Fe | Zinc | $B_{12}$ | Vit D | Ω 3 |
|---|---|---|---|---|---|---|---|
| Black-eyed pea and lentil soup, 1 cup | 157 | 11 | 3.9 | 1.78 | 0 | 0 | 0 |
| Walnuts, 1 oz | 185 | 4.3 | 0.8 | 0.85 | 0 | 0 | 2.6 |
| Dinner roll, whole-wheat, 1 roll | 74 | 2.4 | 0.68 | 0.56 | 0 | 0 | 0 |
| Fresh orange, 1 medium | 69 | 1.3 | 0.18 | 0.11 | 0 | 0 | 0 |
| Spinach, steamed, ½ cup | 20 | 2.7 | 3.2 | 0.69 | 0 | 0 | 0.1 |
| Soy milk, original, 1 cup (fortified) | 104 | 6.3 | 0.42 | 0.26 | 0.85 | 43 | 0 |
| **Totals** | 609 | 28 | 9.18 | 4.25 | 0.85 | 43 | 2.7 |

Key: Cal = kcalories, Pro = protein (grams), Fe = iron (milligrams), Zinc = zinc (milligrams), $B_{12}$ = vitamin $B_{12}$ (micrograms), Vit D = vitamin D (International Units), Ω 3 = omega-3 fatty acids (grams)

## How To "Try It!" Activities Answer Key

**How to Compare Foods Based on Nutrient Density**
The steak has a nutrient density of only 0.000517 mg thiamin per kcal, whereas the broccoli has a nutrient density of 0.00185 mg thiamin per kcal, making it 3 ½ times as nutrient dense with respect to thiamin.

**How to Calculate Personal Daily Values**
% DV for food label (p. 54) based on 1800-kcal diet: total fat = 2% (1.67%), saturated fat = 0%, *trans* fat = 0%, cholesterol = 0%, sodium = 10%, total carbohydrate = 9% (8.52%), and dietary fiber = 7% (7.25%).

## Study Card 2 Answer Key

1. In general, the *DGA* recommend that consumers balance kcalories to manage a healthy body weight by improving eating habits and engaging in regular physical activity; reduce their intakes of such foods and food components as sodium, solid fats (with their saturated fats, *trans* fats, and cholesterol), added sugars, refined grain products, and alcoholic beverages (for those who partake); eat a variety of fruits and vegetables, whole grains, and low-fat milk products and protein foods (including seafood); and build healthy eating patterns that meet energy and nutrient needs while reducing the risk of foodborne illnesses. (See Table 2-1.)

2. c 3. b 4. b

5. To meet the *DGA*, one should select mostly whole or minimally processed foods—primarily plant foods—without added salt, sugars, or solid fats and choose non- or low-fat versions of animal-derived foods where available. Grocery selections should include whole grains and whole-grain products without added sugars or fats; a variety of mainly fresh or frozen vegetables, especially brightly colored ones, without added solid fats or salt; fresh or frozen fruits without added sugars; legumes and nuts; seafood (for non-vegetarians); and non-fat or soy milk and milk products without added sugars.

6. c 7. c 8. a 9. c

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10. Food labels for processed foods include a list of ingredients in descending order by weight and the Nutrition Facts panel, which displays the amounts of food energy (kcalories), total fat, saturated fat, *trans* fat, cholesterol, sodium, total carbohydrate, dietary fiber, sugars, protein, vitamin A, vitamin C, iron, and calcium in one "serving" of the product (also defined in the panel). Sometimes values for additional nutrients are provided as well. The panel also lists the % Daily Value for total fat, saturated fat, cholesterol, sodium, total carbohydrate, dietary fiber, and the micronutrients provided by 1 serving. Because the FDA sets serving sizes for common foods, you can compare 2 different brands or forms of a food by comparing their labels. Comparing the kcalories, sugar, saturated fat, and %DV for calcium for 2 different brands of yogurt, for example, can help you choose the one that is most nutrient dense.
11. Daily Values (DV) are reference values developed by the FDA specifically for use on food labels that reflect dietary recommendations for nutrients and dietary components that have important relationships with health. The "% Daily Value" column on a label provides a ballpark estimate of how individual foods contribute to the total diet. DV help consumers readily see whether a food contributes "a little" or "a lot" of a nutrient and aid them in comparing similar foods to select the ones with less unhealthful components and more healthful ones.
12. Nutrient claims characterize the quantity of a nutrient in a food—i.e., whether the food is a good/excellent source of a health-promoting nutrient or low/free of a component that should be limited or avoided. Health claims go beyond simply describing the food's contents to characterize the relationship between a nutrient or other substance in a food and a disease or health-related condition. Health claims are supported by scientific evidence (and must state the nature of this evidence if it is less than strong). Structure-function claims characterize the relationship between a nutrient or other substance in a food and its role in the body. Unlike health claims, they do not indicate that research has shown a benefit for the food or its contents in preventing or relieving a disease or condition.

13. c 14. d 15. b 16. d

## Critical Thinking Questions[12]

1. The concept of "nutrient profiling" provides an interesting basis of comparison for food items. How might nutrient profiling contribute to improving dietary choice for the general population?
2. Evidence supports that effective use of dietary principles (adequacy, balance, kcalorie control, nutrient density, moderation, and variety) will lead to healthier food choices, and yet people still make poor food choices. Is there a difference in responsibility between individuals and families regarding whether they follow recommended diet-planning principles?
3. The USDA Food Patterns encourage Americans to "eat more foods such as vegetables, fruits, whole grains, seafood, milk, and milk products." This is easy enough to do if one includes these foods in the diet. Harder to follow is the USDA recommendation to decrease high-sodium foods; high-saturated fat, -*trans* fat, and -cholesterol foods; refined grain foods; and foods with solid fats and added sugars. Why is this latter recommendation so hard to achieve in the American diet?
4. How can visualization of portion sizes help individuals make better health choices? Construct a chart that identifies common serving equivalents for basic food groups. Based on your understanding of this concept, how do your favorite restaurant's portion sizes compare to realistic portions? What measures do you think should be taken to get restaurants to utilize portion size control?
5. The promotion of the My Plate icon has led to an increased awareness of the impact that dietary intake has on overall health. Comparing the new MyPlate icon to the prior MyPyramid graphic (see http://www.choosemyplate.gov/print-materials-ordering/mypyramid-archive.html), how would you explain the differences? A lot of attention has been placed on this transformation from MyPyramid to MyPlate. Do you think that MyPlate will fare any better in the world of consumer preference?
6. With regard to required Nutrition Facts food labels, why can there still be a difference between the nutrition information obtained and the actual nutrients received with consumption of the identified food?

[12] Contributed by Daryle Wane.

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**Answer Key**

1. Nutrient profiling examines the overall nutrient constituents in an individual food product. While many foods in basic nutritional science are ranked as high or low in individual nutrients, the concept of nutrient profiling addresses the combined effects of individual nutrients. According to the World Health Organization (WHO), nutrient profiling can be potentially used as a criterion identification source for nutritionally generated terms such as "high fat, low fat, reduced, etc." (http://www.who.int/nutrition/topics/profiling/en/index.html). Standardizing criterion descriptors would contribute to promotion of healthier eating habits based on factual evidence rather than manufacturer-generated results.

2. This issue is two fold: one must consider (1) how it affects the individual and (2) how it affects the family. With regard to the individual perspective, present society attributes responsibility for one's actions to the person. An adult is assumed to be able to make individual choices based on his/her beliefs in the context of mediating variables such as preference and economics. "You are what you eat" is a common adage that identifies the individual with his/her food choices. With regard to families, society considers parents responsible for providing and offering healthy food choices to their children. This additional responsibility focuses more attention on behavioral actions. Unfortunately, even when they know about these recognized diet-planning principles, both individuals and families still tend to make poor food choices. The behavioral burden of choice may be mediated by other variables as noted above both for individuals and families. The key concept here is how to successfully incorporate these diet-planning principles in making food decisions for both individuals and families. The successful application of these principles will help enable healthier diet outcomes.

3. The reason that it is harder to achieve the latter recommendation is that the majority of the typical American diet is composed of processed foods in which sodium is found in large amounts, as it functions as a preservative. Additionally, the American diet is rich in saturated fats and cholesterol. And while *trans* fats have been removed from many foods as a result of legal pressure brought on by many consumer groups, the general public still consumes too much saturated fat. Now, we are seeing an increase in serum triglyceride levels, which are beginning to be associated with adverse health effects for a large majority of the American public. As noted, processed foods are often refined-grain foods; thus, nutrient concentrations are affected. Certain foods have their nutrients enriched as a result of this manufacturing process whereas other foods now have been fortified with additional nutrients such that they appear to be healthy food choices when in fact they are poor food substitutes. Many convenience foods also contain solid fats and sugars. It is extremely important for consumers to read food labels for all food purchases of processed foods so as to be aware of potential food additives. While convenience foods may help an individual with time management issues, an increased proportion of processed foods in the diet can potentially lead to health problems. These convenience foods are widely distributed to the American consumer, making a healthy food choice at times difficult.

4. Visualization of portion sizes allows the individual to manage serving equivalents by utilizing common objects to provide reliable estimates. If an individual understands that a deck of cards represents a 3-ounce serving of meat, then this will allow her/him to make healthier food choices. Visual displays help to reinforce these concepts.

   Most restaurants promote the philosophy of quality food at a good cost. The consumer environment is focused on getting the best value and quantity for the money. Therefore, more is considered not only better for its economic strength but for its ability to feed individuals. Thus, the restaurant atmosphere encourages individuals to want more, get more, and eat more. This is in opposition to the concept of visualization of portion sizes. Due to the advertising push to get more, the general public falsely perceives that a 16-ounce piece of meat literally hanging off the plate is a realistic portion. This poses a delicate controversy whereby consumers may have to petition for government regulation to persuade restaurants to conform to realistic portion sizes for identified foods. Legal regulation is one option, but that may prove not to be realistic given constitutional rights and liberties. Thus, the responsibility and accountability for personal choice must be based on education and evidenced-based practice. Changing how individuals understand their food consumption patterns may lead to better health outcomes. Evidenced-based practice may influence how foods are formulated and how restaurants market their products for the general public's consumption.

5. The former MyPyramid graphic provided detailed information about the combined importance of diet and exercise. It highlighted individual food groups and correlated this information with individual aspects such as age, gender, and calorie consumption. The new MyPlate icon provides a more simplistic graphic focusing on visualization of proportional portion sizes for the five food groups. Additional information previously identified

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in the MyPyramid graphic can be obtained within the specified government web site. The MyPlate icon focuses on food portion sizes as being the critical element.

The response to the second part of this question will vary dependent on the individual student's perception of the graphic. The discussion will facilitate a conversation that will help to identify differences and promote a consensus of opinion. Variables presented may include (but are not limited to): personal choice/preference, ease of accessing information, interest in health promotion concerns, and/or pertinent health history/family associations that may warrant additional interest and knowledge acquisition.

6. Nutrition Facts labels are based on individual servings, whereas individuals often eat portions equal to several "servings," especially if the food is not packaged as an individual serving. For example, if the package contains 2 servings and an individual eats the entire package, then the nutrient and caloric values are doubled. Additionally, certain foods such as cereals and cake mixes have food labels indicating differences in nutrient values based on preparation methods. The food item first lists the information for the item as is, in the box, and then for food item in the prepared state. Thus, these nutrient and calorie values will differ. It is therefore very important to not only read the food label but understand how many servings are contained in the product as well as how the preparation of the item will affect its nutrient value.

## IM Worksheet Answer Key

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

**Worksheet 2-4: Chapter 2 Crossword Puzzle**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | discretionary calories | 4. | variety | 7. | energy | 10. | food |
| 2. | nutrients | 5. | lactovegetarian | 8. | nutrient density | 11. | heaviest |
| 3. | nutrient claims | 6. | balance | 9. | adequacy | 12. | moderation |

**Worksheet 2-5: Interpreting Food Labels (Internet Exercise)**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. | a | 3. | a | 5. | b | 7. | a |
| 2. | b | 4. | b | 6. | b | 8. | c |

8. a. 570 calories; b. low calorie food source; c. moderate calorie food source; d. high calorie food source; e. low nutrient food source; f. high nutrient food source; g. high fiber content; h. low in saturated fat content; i. high in calcium content; j. 420 calories; k. low in calories, saturated fat, high in fiber and calcium compared with meatloaf

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# Worksheet 2-1: Daily Calorie Evaluation

With respect to each of the following food groups, identify the weight portion that you ate over a 24-hour period (teaspoons, ounces, or cups) in the first row and the amount of kilocalories that you consumed from those foods in the second row.

| **Food Groups** | **Fruits** | **Vegetables** | **Grains** | **Protein Foods** | **Milk** | **Oils** | **Discretionary** |
|---|---|---|---|---|---|---|---|
| Weight portion | | | | | | | |
| Kcal portion | | | | | | | |

24-hour total kilocalories consumed: _____

Once you have finished this chart comparison, please complete the following information in the table below.

| | |
|---|---|
| Age | |
| Gender | |
| Weight (kilograms) | |
| Height (cm) | |
| Exercise level (Sedentary, moderately active, etc.) | |

Now for some calculations:

1. Calculate your BMI: _____
2. Determine your daily kcal needs using both of the following formulas:

**Harris-Benedict Formula:**

Male 66.5 + (13.7 × weight in kg) + (5 × height in cm) – (6.8 × age in years)
Female 655 + (9.6 × weight in kg) + (1.8 × height in cm) – (4.7 × age in years)

- If sedentary multiply your BMR by the activity factor of ×1.2
- If active multiply your BMR by the activity factor of ×1.55

- Kilocalorie Needs: _____

**Mifflin-St. Jeor Formula:**

Male 10 × weight (kg) + 6.25 × height (cm) – 5 × age (years) + 5
Female 10 × weight (kg) + 6.25 × height (cm) – 5 × age (years) – 161

- Kilocalorie Needs: _____

3. Compare and reflect on your obtained results.

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# Worksheet 2-2: Compare Your Food Intake to Recommended Daily Amounts from Each Group

| List food item and amount. | Indicate amount consumed from each food group, using the appropriate unit of measurement (in parentheses). | | | | | | Estimate values. |
|---|---|---|---|---|---|---|---|
| **Food Item** | **Fruits (cups)** | **Vegetables (cups)** | **Grains (oz.)** | **Protein foods (oz.)** | **Milk (cups)** | **Oils (tsp.)** | **Discretionary kcalories** |
| *Breakfast:* | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| *Snack:* | | | | | | | |
| | | | | | | | |
| *Lunch:* | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| *Snack:* | | | | | | | |
| | | | | | | | |
| *Dinner:* | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| *Snack:* | | | | | | | |
| | | | | | | | |
| **Total consumed** | | | | | | | |
| **Recommended based on EER** | | | | | | | |

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# Worksheet 2-3: Supermarket Worksheet

For the following list of food items, please go to your local supermarket and fill in the information requested in the table below.

| Food product | Aisle location | What items are on the opposite side of the aisle? | Shelf location | Is the price readily available? |
|---|---|---|---|---|
| Vanilla ice cream cups | | | | |
| Hot dog rolls | | | | |
| Fresh broccoli | | | | |
| Canned fruit cocktail | | | | |
| Infant formula | | | | |
| Elbow noodles | | | | |
| Canned soup | | | | |
| Frozen pizza | | | | |
| Soda | | | | |
| Bottled water | | | | |

Name of supermarket: _____ Total # of aisles: _____

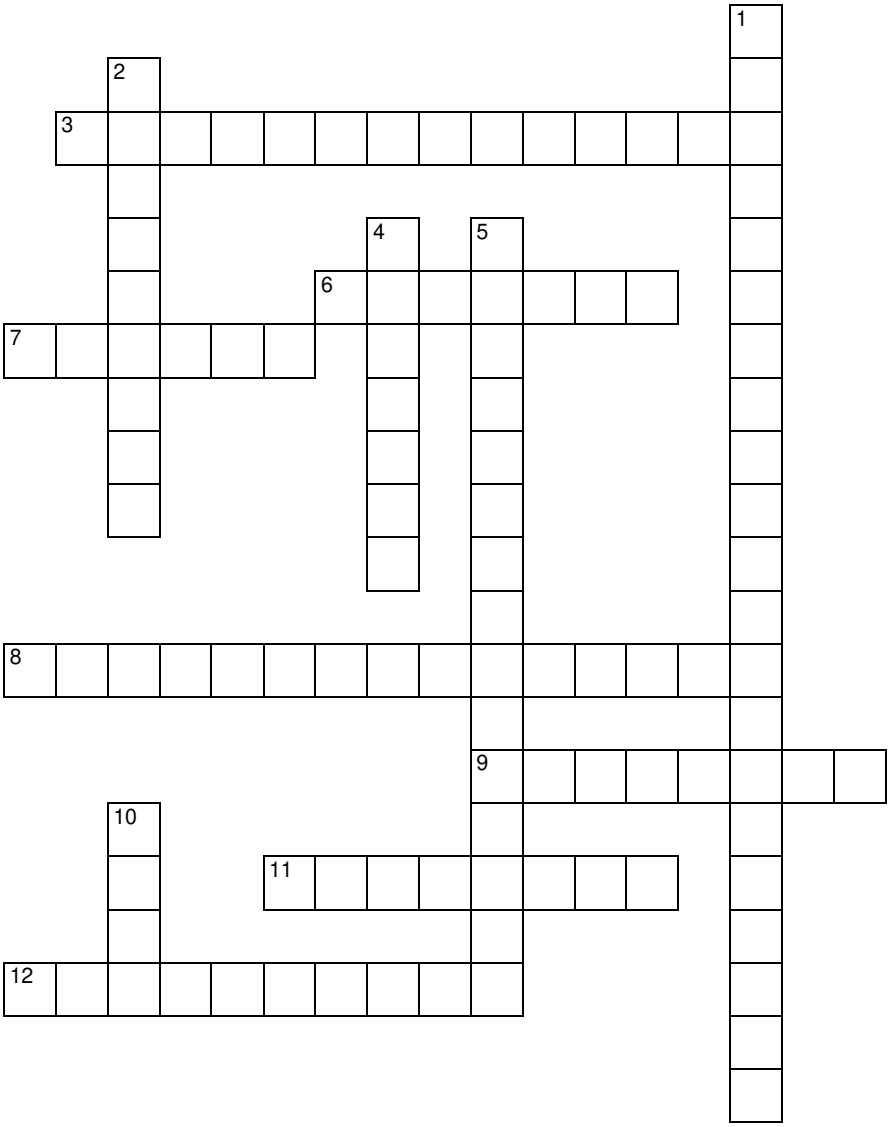
**Come prepared to class to discuss your findings. Questions for discussion:**

1. How is "food placement" determined in the supermarket setting?
2. Do most consumers compare unit pricing between similar food products?
3. Is there a difference in pricing between low-nutrient-density vs. high-nutrient-density foods?

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# Worksheet 2-4: Chapter 2 Crossword Puzzle




| Across | Down |
|---|---|
| 3. FDA-approved statements about food components on food labels<br>6. Eating some food from each food group<br>7. USDA Food Guides help individuals meet nutrient needs within an _____ allowance.<br>8. Indicator of which food provides the most nutrients for the least kcalories<br>9. Situation when enough calories and nutrients are provided in the diet<br>11. First item in an ingredient list is present in the food in the _____ amount<br>12. Occasionally eating foods high in added sugars and solid fats | 1. Energy used to maintain weight balance after nutrient needs are met<br>2. Food groups in the USDA Food Guides are arranged by similar _____.<br>4. Eating different foods from within each food group<br>5. A type of vegetarian diet that includes dairy foods<br>10. *Dietary Guidelines for Americans* translate the DRI into _____ recommendations |

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# Worksheet 2-5: Interpreting Food Labels (Internet Exercise)

Go to the following website to answer questions 1-8:
http://www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm20026097.htm.

Scroll down the page to **Understanding & Using the Nutrition Facts Label** and click on "Eating Healthier & Feeling Better Using the Nutrition Facts Label" to answer questions 1-7. Then click on "Proposed Changes to the Nutrition Facts Label" and answer question 8.

1. The information on the Nutrition Facts label is based on one serving of a food item.
   a. True
   b. False

2. On each food label there is a % DV for sugar.
   a. True
   b. False

3. In order to maximize your protein intake, you should eat foods that are considered to be lean protein sources.
   a. True
   b. False

4. Foods that are labeled "fat free" do not contain any fat.
   a. True
   b. False

5. % Daily Value is based on a 2,500-kilocalorie diet.
   a. True
   b. False

6. The representative food label indicates that the serving size for the item is 2 cups.
   a. True
   b. False

7. The amount of *trans* fat on the label is equal to the amount of saturated fat.
   a. True
   b. False

8. The Percent Daily Value of what item will be required if the proposed changes take place?
   a. hidden sugars
   b. total fat
   c. vitamin D
   d. vitamin A
   e. folate

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# Handout 2-1: Health Claims and Structure-Function Claims

**Reliable Health Claims on Food Labels—The "A" List**

- Diets adequate in calcium may reduce the risk of osteoporosis.
- Diets low in sodium may reduce the risk of high blood pressure.
- Diets low in saturated fat and cholesterol, and as low as possible in *trans* fat, may reduce the risk of heart disease.
- Diets low in total fat may reduce the risk of some cancers.
- Low-fat diets rich in fiber-containing grain products, fruits, and vegetables may reduce the risk of some cancers.
- Diets low in saturated fat and cholesterol and rich in fruits, vegetables, and grain products that contain fiber, particularly soluble fiber, may reduce the risk of heart disease.
- Low-fat diets rich in fruits and vegetables may reduce the risk of some cancers.
- Diets adequate in folate may reduce a woman's risk of having a child with a neural tube defect.
- Sugar alcohols do not promote tooth decay.
- Diets low in saturated fat and cholesterol that include soluble fiber from foods may reduce the risk of heart disease.
- Diets low in saturated fat and cholesterol that include 25 grams of soy protein may reduce the risk of heart disease.
- Diets rich in whole grain foods and other plant foods and low in total fat, saturated fat, and cholesterol may reduce the risk of heart disease and some cancers.
- Diets low in saturated fat and cholesterol that include 3.4 grams of plant stanol esters may reduce the risk of heart disease.
- Diets containing foods that are rich in potassium and low in sodium may reduce the risk of high blood pressure and stroke.
- Drinking fluoridated water may reduce the risk of tooth decay.

**The FDA's Health Claims Report Card**

| Grade | Level of Confidence in Health Claim | Required Label Disclaimers |
|---|---|---|
| A | High: Significant scientific agreement | These health claims do not require disclaimers; see list above for examples. |
| B | Moderate: Evidence is supportive but not conclusive | "[Health claim.] Although there is scientific evidence supporting this claim, the evidence is not conclusive." |
| C | Low: Evidence is limited and not conclusive | "Some scientific evidence suggests [health claim]. However, FDA has determined that this evidence is limited and not conclusive." |
| D | Very low: Little scientific evidence supporting this claim | "Very limited and preliminary scientific research suggests [health claim]. FDA concludes that there is little scientific evidence supporting this claim." |

**Examples of Structure-Function Claims**

- Builds strong bones
- Promotes relaxation
- Improves memory
- Boosts the immune system
- Supports heart health
- Defends health
- Slows aging
- Guards against colds
- Lifts spirits

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