Instructor's Manual for Unit 2 – The Inside Story about Nutrition and Health

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Learning Objectives

After completing Unit 2, the student should be able to:

2.1 Identify characteristics of diets related to the development of specific diseases.

2.2 Explain how differences in diets of early versus modern humans may promote the development of certain diseases.

2.3 List the types of food that are core components of healthful diets.

Brief Chapter Outline

I. Nutrition in the Context of Overall Health
   A. The Nutritional State of the Nation
      1. Shared Dietary Risk Factors
      2. Inflammation and Oxidative Stress
      3. Nutrient–Gene Interactions and Health
   B. The Importance of Food Choices
II. Diet and Diseases of Western Civilization
   A. Our Bodies Haven't Changed
      1. Then...
      2. ...and Now
   B. Different Diets, Different Disease Rates
   C. The Power of Prevention
III. Improving the American diet
   A. What Should We Eat?
   B. Nutrition Surveys: Tracking the American Diet

Answers to Global Nutrition Watch Activities

1. b
2. e
3. are adapted to specific diets

Critical Thinking Questions/Answers

1. How are the results of nutrition surveys used? Give an example of a national survey.

   Results of nutrition surveys are used to identify problem areas within the food supply, characteristics of diets consumed by the public, and the prevalence of nutrition-related health disorders. The surveys provide information ranging from the amount of lead and pesticides in certain foods to the adequacy of diets of low income families. Together with the results of studies conducted by university researchers and others, they provide the information needed to give direction to food and nutrition programs and to policies aimed at improving the availability and quality of the food supply. See Table 2.6. (LO 2.3)

2. Identify the dietary pattern and the types of foods that are associated with decreased inflammation, oxidative stress, or both.

   A dietary pattern high in whole grains, vegetables, fruit, poultry, and fish and low in refined grains, added sugars, red and processed meat, high-fat dairy products, and sweetened beverages is associated with lower levels of inflammation compared to other dietary patterns. Foods associated with decreased inflammation, oxidative stress, or both include colorful fruits and vegetables, dried beans, whole grains, fish and seafood, red wines, dark chocolates, olive oil, nuts, and coffee (Table 2.2). (LO 2.1)

3. Which behaviors constitute our lifestyle?

   Behaviors that constitute our lifestyle include diet, smoking habits, illicit drug use or excessive drinking, level of physical activity or psychological stress, and the amount of sleep we get. (LO 2.1)

4. What are the negative health consequences associated with adopting a Western-type diet? Is a Western-type diet only seen in the United States? Justify your answer.

   People who consume Western-type diets are at higher risk of developing obesity, diabetes, cancer, heart disease, and hypertension. No, for example, dietary habits in Japan are rapidly becoming similar to those in the United States. Hamburgers, fries, steak, ice cream, and other high-fat foods are gaining in popularity. Rates of diabetes, heart disease, and cancer of the breast and colon are on the rise in Japan. Similarly, the "diseases of Western civilization" are occurring at increasing rates in Russia, Greece, Israel, and other countries adopting the Western diet. (LO 2.1) (LO 2.2)

Classroom Activities

Activity 2-1: Putting Together a Family Tree Health History[1]

Introduction: Many common diseases and disorders run in families, primarily due to shared genetic traits and health-related habits. This activity asks students to identify common diseases and disorders among relatives and to participate in a class discussion about nutritional approaches students can use to reduce their own risk.

As an alternative to the instructor-lead in-class activity described here, you can simply assign students the family tree health history assignment card (Activity 1) provided in the back of the textbook.

Activity Overview: Form completion followed by class discussion.

Purpose:
- To expand students' awareness of common diseases and disorders that "run in the family."
- To familiarize students with the concept that dietary intake and weight status can help prevent or postpone the development of a number of common diseases and disorders.

Preparation:
1. Handout 2-1, "Family Tree Health History" (or the Activity 1 card from the back of the textbook) should be used by students.
2. Prepare visual aid if needed using Transparency Master 2, "Dietary and Weight Status Characteristics."

Instructions:
1. Students should have access to Handout 2-1, "Family Tree Health History" (or the Activity 1 card).
2. Before students complete the form, present information related to the activity, for example:
   a. A number of common diseases and disorders, such as hypertension, diabetes, and heart disease, tend to run in families.
   b. Similar disease occurrence among family members is primarily related to shared genetic traits and health-related habits.
   c. Family history of a particular disease or disorder does not mean that other members of the family are destined to develop the same disease or disorder.
   d. Knowledge of your family health history can help you take actions that may prevent or delay the onset of diseases and disorders that tend to run in families.

[1] contributed by Judith Brown, University of Minnesota; this activity also complements Units 10, 13, and 19

e. Diet and weight status represent two important areas where individuals can modify their risk of developing disorders that run in their family.

3. Ask students to complete Handout 2-1.

4. When the forms have been completed, begin a class discussion centered on matching diseases and disorders to examples of dietary and weight status characteristics (presented as a visual aid in class, Transparency Master 2) that can help prevent or postpone the development of the diseases and disorders listed.

5. Answers to the matching in Transparency Master 2:
   A. osteoporosis
   B. hypertension, heart disease, cancer, diabetes, osteoporosis
   C. heart disease, diabetes
   D. heart disease
   E. hypertension, heart disease, cancer, diabetes
   F. hypertension, heart disease
   G. tooth decay, diabetes, heart disease

Activity 2-2: Comparison of Early Human and Present-Day Diets—Discussion
Compare, in detail, the foods pictured in the two photographs in textbook Illustration 2.6. Ask student volunteers to list items from each photograph in two columns on the board, with food groups (e.g., protein) from each basket paralleling each other. For example:

Hunter-Gatherer Diet (Left)	Modern, Western-Type Diet (Right)
birds' eggs	hot dogs, bologna
wild cucumbers	nothing—no vegetables

Discuss the two sets of food choices relative to:
   a. the *2015-2020 Dietary Guidelines for Americans* (see http://health.gov/dietaryguidelines/2015/guidelines/executive-summary/
   b. MyPlate (textbook Table 2.5)

Feedback: Almost every guideline recommendation is violated by the selections in the basket on the right. For example, the basket on the right contains high-fat, high-salt, and high-sugar and low-fiber choices. The hunter-gatherer diet on the left includes only unprocessed, whole foods such as fresh vegetables, nuts, and berries.

Activity 2-3: The Modern Western-Type Diet—Calculation, Computer Exercise
Have students individually, or in groups, calculate the nutrient content of the items in the basket on the right in Illustration 2.6. Calculations may be made manually (Appendix A) or with a computer. Use *Diet Analysis Plus* or go to a Web database site (e.g., http://ndb.nal.usda.gov/ndb/foods/list).

Feedback: See feedback for Activity 2-2.

Activity 2-4: Chronic and Deficiency Diseases—Individual or Group Library or Web Activity
Ask the students to find and print or photocopy current pictures of people with severe *deficiency* diseases. Some pictures of severe deficiency diseases are in the text. The challenge is to find timely, current examples of deficiencies. Students should be prepared to describe the disease and its causes, and to discuss any contributing circumstances (e.g., war, poverty and limited access to foods, geographic limitations). Pictures of currently prevalent diseases, such as marasmus, may be found in news magazines or on the Web. Pictures of uncommon diseases, such as pellagra, may be found in dictionaries, encyclopedias (available on the Web through many university library sites), or basic nutrition texts. Students may find pictures of deficiencies at www.icrc.org (International Committee of the Red Cross). Students could also try the United Nations site and the World Health Organization site.

Provide the class with pictures of people who have *chronic* diseases including heart disease, high blood pressure, cancer, diabetes, obesity, and dental disease. Ask students to describe these diseases and their causes.

Feedback: The comparison of the pictures and the discussion of causes should provide a graphic reminder that:

a. Severe deficiency diseases usually are visible while chronic diseases frequently are not. You cannot always tell by looking at someone if they suffer from a chronic disease. Chronic diseases are almost always related to diet and lifestyle, but they are usually associated with dietary excess rather than dietary deficiency (iron-deficiency anemia and osteoporosis are two examples of exceptions).
b. Deficiency diseases have been largely eliminated in the U.S.; however, chronic diseases are prevalent.

Activity 2-5: Nutrition Knowledge Survey—Individual Assignment Followed by Group Discussion
Have students take the "Nutrition Knowledge Survey" (Handout 2-2). Then have each student administer the test to three classmates not enrolled in the course. Grade and compile results for the class and for students not taking the class.

Feedback: Discuss the relationship between diet and health. Emphasize the role of diet in the development of chronic diseases (refer to Activity 2-3 above). These diseases are the leading causes of death in this country *and* among the leading causes of reduced quality of life as we age.

Answer Key for Handout 2-2: Nutrition Knowledge Survey

1. e
2. d
3. a
4. b
5. e
6. c
7. b
8. d
9. c
10. a
11. a
12. See textbook Table 2.4.

Handout 2-1: Family Tree Health History

Fill in the table to the extent you can by placing a check mark under any of your relatives (biological or adoptive) who have a history of the disease or disorder listed.

Disease or Disorder	Maternal Grandparents	Paternal Grandparents	Mother	Father	Brother or Sister
Hypertension					
Heart disease/heart attack					
Cancer					
Diabetes					
Osteoporosis					
Tooth decay					

In general, the greater the number of relatives with a specific disease or disorder, the greater the likelihood that other family members may develop the same disease or disorder. It should be remembered that family history is only one of many indicators of disease risk among family members. Adoptive persons with unknown family history may have genetic characteristics that increase or decrease disease risk in ways that cannot be estimated by this activity.

Handout 2-2: Nutrition Knowledge Survey

1. What is the leading cause of death in the United States?
   a. cancer
   b. diabetes
   c. accidents
   d. kidney disease
   e. heart disease

2. Which vitamins function as antioxidants?
   a. A and B_6
   b. folate and niacin
   c. B_{12} and D
   d. C and E
   e. thiamin and K

3. Which disease or disorder is most likely caused by excessive alcohol consumption and a poor overall diet?
   a. cirrhosis of the liver
   b. Alzheimer's disease
   c. osteoporosis
   d. diabetes
   e. heart disease

4. Which disease or disorder is characterized by abnormal utilization of glucose by the body and elevated blood glucose levels?
   a. iron-deficiency anemia
   b. diabetes
   c. hypertension
   d. cancer
   e. Alzheimer's disease

5. According to ChooseMyPlate.gov individuals should drink _____ instead of sugary drinks.
   a. milk
   b. tea
   c. juice
   d. coffee
   e. water

6. According to ChooseMyPlate.gov, you should make at least _____% half of your grains whole grains.
   a. 20
   b. 30

c. 50
d. 80
e. 100

7. Which country has the highest life expectancy?
   a. Denmark
   b. Japan
   c. Belgium
   d. Ireland
   e. Canada

8. Which factor exerts the strongest overall influence on health and longevity?
   a. access to quality health care
   b. genetics
   c. stress
   d. lifestyle
   e. exposure to environmental toxins

9. Hypertension is associated with excessive _____ and low potassium intake.
   a. iron
   b. calcium
   c. sodium
   d. zinc
   e. magnesium

10. Free radicals can damage lipids, proteins, cells, DNA, and eventually tissues by altering their chemical structure and functions.
    a. true
    b. false

11. Hypertension is defined as blood pressure exerted inside of blood vessel walls that typically exceeds 140/90 mm Hg.
    a. true
    b. false

12. List one *Healthy People 2020* objective.

Transparency Master 2: Dietary and Weight Status Characteristics

Which dietary or weight status characteristic can help prevent or postpone the development of hypertension, heart disease, cancer, diabetes (type 2), osteoporosis, or tooth decay (dental caries)?

For each characteristic on the right, place a check mark under the condition or conditions it can help to prevent.

Hypertension	Heart disease	Cancer	Diabetes	Osteoporosis	Tooth decay	
						A. Adequate intake of calcium and vitamin D
						B. Regular consumption of vegetables and fruits
						C. Regular consumption of whole grains
						D. Limited *trans* fat intake
						E. Maintenance of a healthy body fat percentage
						F. Limited salt intake
						G. Limited intake of sugar and added sugar