Chapter 1 – Overview of Nutrition and Health

Chapter Outline

I. Food Choices
   A. Preference
   B. Habit
   C. Associations
   D. Ethnic Heritage and Tradition
   E. Values
   F. Social Interaction
   G. Emotional State
   H. Availability, Convenience, and Economy
   I. Age
   J. Occupation
   K. Body Image
   L. Medical Conditions
   M. Health and Nutrition

II. The Nutrients
   A. Carbohydrates, Fats, and Proteins
   B. Vitamins, Minerals, and Water
   C. kCalories: A Measure of Energy
      1. How to Calculate the Energy Available from Foods
   D. Energy Nutrients in Foods
   E. Energy Storage in the Body
   F. Alcohol, Not a Nutrient

III. Nutrient Recommendations
   A. Dietary Reference Intakes
      1. Setting Nutrient Recommendations: RDA and AI
      2. Facilitating Nutrition Research and Policy: EAR
      3. Establishing Safety Guidelines: UL
      4. Using Nutrient Recommendations
      5. Setting Energy Recommendations
   B. Acceptable Macronutrient Distribution Ranges (AMDR)
   C. Nutrition Surveys
      1. Coordinating Nutrition Survey Data
      2. Healthy People Reports

IV. Dietary Guidelines and Food Guides
   A. Dietary Ideals
   B. Dietary Guidelines for Americans
   C. Fitness Guidelines
   D. The USDA Food Guide
      1. Recommended Daily Food Amounts
      2. Notable Nutrients
      3. Nutrient Density
      4. Discretionary kCalorie Allowance
      5. Portion Control
      6. Mixtures of Foods
      7. Vegetarian Food Guide
      8. Ethnic Food Choices
   E. MyPyramid

V. Food Labels
   A. The Ingredient List
   B. Serving Sizes
VI. Food Safety
A. How to Prevent Foodborne Illnesses

VII. Nutrition in Practice – Finding the Truth about Nutrition
A. Why do nutrition news reports and claims for nutrition news reports seem to contradict each other so often?
B. So how can a person tell what claims to believe?
C. What about nutrition and health information found on the Internet? How does a person know whether the websites are reliable?
D. Everyone seems to be giving advice on nutrition. How can a person tell whom to listen to?
E. What about nurses and other health care professionals?
F. What roles might these other health care professionals play in nutrition care?

Multiple Choice
Circle the letter for the best response to each question.

1. Broccoli, cabbage, brussel sprouts and grapefruit juice all contain _____ which may help reduce the risk of cancer.
   a. fiber c. potassium  
   b. lycopene d. phytochemicals

2. Margarine made with plant sterol and stanol esters which may lower blood cholesterol is considered a(n):
   a. functional food. c. non-nutritive food  
   b. organic food. d. processed.

3. Which nutrient is not a source of energy, but important in the body’s production of energy?
   a. fat c. protein  
   b. carbohydrate d. vitamins

4. _____ is not classified as a nutrient.
   a. Water c. Fat  
   b. Protein d. Alcohol

5. The American College of Sports Medicine recommends that people spend at least _____ minutes each day exercising to maintain body weight.
   a. 30 c. 60  
   b. 90 d. 120

6. A portion of grain, which is equivalent to one ounce, is equal to:
   a. 1 English muffin. c. 1 bagel.  
   b. 1 slice of bread. d. 1 cup of rice.

7. An example of a poor life choice that could increase a person's risk of developing disease is:
   a. moderate alcohol consumption. c. poor food choices.  
   b. exercising sixty minutes per day. d. not taking nutrient supplements.

8. The USDA Food Guide recommends that people do all except which of the following? Consume:
   a. more refined grains. c. more dark-green vegetables.  
   b. more whole grains. d. less sugar.
9. Legumes are found in which food group?
   a. vegetables c. grains
   b. meat and beans d. other

10. Which food is an example of one which provides discretionary kcalories?
    a. pudding made from low-fat milk c. fried chicken
    b. fresh fruit cup d. oven-baked french fries

11. In the vegetarian diet, which food should be consumed with meat alternatives to supply the iron which meat usually provides?
    a. dark green vegetables c. soy milk
    b. citrus fruit d. nuts

12. A canned soup label for ingredients reads: “water, broccoli, cheddar cheese, phosphate and salt.” Which ingredient is the most predominant by weight?
    a. water c. cheddar cheese
    b. broccoli d. salt

13. The FDA requires that food labels provide information on Daily Values (DV) for all of the following nutrients except:
    a. total fat (grams and % of DV). c. food energy from fat (kcalories).
    b. saturated fat (grams and % of DV). d. monounsaturated fat (grams and % of DV).

14. For a label to claim that it is a good source of vitamin C, it must contain _____ of the Daily Value for that nutrient.
    a. 5-10% c. 25-30%
    b. 10-19% d. 50%

15. Under the new FDA health claims ranking system, assigning a B ranking to a claim means that there is a:
    a. high level of scientific evidence. c. low level of scientific evidence.
    b. moderate level of scientific evidence. d. very low level of scientific evidence.

16. Which statement is an example of a structure-function claim?
    a. Prevents cancer c. Cures heart disease

17. Which food is rarely unsafe or a risk for being a source of food borne illness?
    a. raw sprouts or scallions c. high-sugar foods
    b. soft cheeses d. sandwiches

18. If a portion of macaroni contains 42 grams of carbohydrate, how many kcalories from carbohydrate does it contain?
    a. 42 c. 292
    b. 168 d. 378

19. Grits, macaroni, rice, biscuits and cornbread are examples of grains typically consumed by which group?
    a. Asians c. Mediterranean
    b. Mexicans d. Deep South (West African influence)

20. Examples of typical milk products that Asians consumer include:
    a. soy milk. c. cheese and flan.
    b. buttermilk and cheddar cheese. d. ricotta and yogurt.
21. To help maintain physical flexibility one can:
   a. swim. c. lift weights.
   b. do yoga. d. play tennis.

22. Which of the following is not a benefit of regular exercise?
   a. improved decision making c. improved body composition
   b. more restful sleep d. lower risk of type 2 diabetes

23. Which food group’s recommended intake does not increase as kcalorie intake increases?
   a. fruit c. vegetables
   b. grains d. milk

24. Which food label health claim is on the “A” list?
   a. Vitamin C will prevent a cold.
   b. Increased intake of vitamin B12 will reduce the risk of heart disease.
   c. Lowering sodium intake can reduce the risk of hypertension.
   d. Ginseng will increase one's energy level.

25. An example of cross-contamination is:
   a. re-freezing chicken.
   b. serving hot foods at 125º F.
   c. marinating meats at room temperature.
   d. cutting raw meat and vegetables on the same cutting board.

26. Coronary heart disease, liver disease and diabetes are examples of:
   a. genetic disorders. c. diet-related diseases.
   b. viral infections requiring antibiotics. d. bacterial infections requiring antibiotics.

27. The USDA’s “My Pyramid” for a 2,200-kcalorie diet recommends how many cups of vegetables per day?
   a. 2 c. 5
   b. 3 d. 6

28. From the 1970s to present, the chief nutritional concern has been:
   a. lack of food. c. nutrient deficiency.
   b. prevention of infectious disease. d. nutrient excess.

29. Eating a variety of food:
   a. provides adequate amounts of vitamins and minerals.
   b. promotes weight loss.
   c. promotes low fat intake.
   d. prevents cancer.

30. If you were researching information on the web regarding vitamins, which website would not be a good choice?
   a. myvitamins.gov c. myvitamins.com
   b. myvitamins.edu d. myvitmains.net

Fill-in-the-Blank Exercises

A. Try to fill in the missing words/phrases from memory to complete the chapter summary.
   
   A person selects 1.____________________ for many different reasons. Food choices influence
   2.____________________—both positively and negatively. Individual food selections neither make nor break a
diet's healthfulness, but the 3.____________________ of foods selected over 4.____________________ can make
an important difference to health. In the interest of health, people are wise to think “5.____________________” when making their food choices.

Foods provide 6.____________________—substances that support the growth, 7.____________________, and repair of the body's tissues. The six classes of nutrients are 8.____________________, carbohydrates, fats, proteins, vitamins, and minerals. Vitamins, 9.____________________, and water facilitate a variety of activities in the body. Foods rich in the 10.____________________ nutrients (carbohydrates, fats, and proteins) provide the major materials for building the body's tissues and yield 11.____________________ the body can use or 12.____________________. Energy is measured in 13.____________________.

The 14.____________________ are a set of nutrient intake values that can be used to plan and evaluate dietary intakes for healthy people. The 15.____________________ defines the energy intake level needed to maintain energy balance in a healthy adult of a defined age, gender, weight, height, and 16.____________________ level. The 17.____________________ define the proportions contributed by carbohydrate, fat, and 18.____________________ to a healthy diet. Nutrition surveys measure people’s food 19.____________________ and evaluate the nutrition 20.____________________ of populations. Information gathered from nutrition surveys serves as the basis for many major diet and nutrition reports, including 21.____________________.

A well-planned 22.____________________ delivers adequate nutrients, a balanced array of 23.____________________, and an appropriate amount of 24.____________________. A well-planned diet is based on 25.____________________ foods, moderate in substances that can be detrimental to 26.____________________, and 27.____________________ in its selections. The Dietary Guidelines apply these principles, offering practical advice on how to 28.____________________ for good health.

Regular 29.____________________ promotes health and reduces risk of 30.____________________ disease. The ACSM, the Dietary Guidelines for Americans 2005, and the DRI committee recommend at least 31.____________________ of physical activity each 32.____________________ for health benefits and 33.____________________ or more for maintaining 34.____________________. The ACSM has issued recommendations for physical activity to develop and maintain 35.____________________.

Food group plans such as the USDA 36.____________________ serve as the basis for planning 37.____________________, balanced, and varied diets. Each 38.____________________ contributes key nutrients, a feature that provides 39.____________________ in diet planning. The USDA 40.____________________ emphasizes 41.____________________ foods within each group. The 42.____________________ is the difference between the 43.____________________ needed to meet nutrient needs and those needed for energy. 44.____________________ is an educational tool used to illustrate the concepts presented in the 45.____________________ and the USDA 46.____________________.
47. ________________ provide consumers with information they need to select foods that will help them meet their nutrition and health ________________. 49. ________________ are a set of nutrient standards created by the 50. ____________ for use on food labels. 51. ________________ that are graded “A” are backed by the highest standards of 52. ________________. 53. ________________ with a “B,” “C,” or “D” grade are supported by 54. ________________ scientific 55. ________________ than those graded with an “A.”

B. Complete the table to identify four high-fat foods and an appropriate low-fat substitute for each.

<table>
<thead>
<tr>
<th>High-fat item</th>
<th>Low-fat substitute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkey cold cut</td>
<td></td>
</tr>
<tr>
<td>Commercial blue cheese salad dressing</td>
<td></td>
</tr>
<tr>
<td>Commercial cream of broccoli soup</td>
<td></td>
</tr>
<tr>
<td>Grilled Rueben sandwich</td>
<td></td>
</tr>
</tbody>
</table>

Word Problems

Try to solve the following problems. See the answer key for solutions and explanations.

1. Calculate the kcalories from carbohydrate in the following meal.

   1 cup skim milk
   3 ounces grilled chicken breast, boneless
   1 medium roll
   1 teaspoon mayonnaise
   ½ cup apple sauce

2. How many serving equivalents of grain and vegetables does this dinner have?

   1 cup tossed salad
   1 cup of chili
   ½ cup rice
   ½ cup steamed spinach
   1 piece of corn bread

3. On a 1500-kcalorie diet, how many grams of carbohydrate should you consume in order to meet the DRI recommendations for percent of total energy?
Matching

A. Write the letter for the appropriate definition beside each term.

1. _____ adequacy
2. _____ balance
3. _____ chronic diseases
4. _____ foodborne illness
5. _____ kcalorie control
6. _____ malnutrition
7. _____ moderation
8. _____ nutrient density
9. _____ undernutrition
10. _____ variety

a. any condition caused by deficient or excess energy or nutrient intake or by an imbalance of nutrients.
b. underconsumption of food energy or nutrients severe enough to cause disease or increased susceptibility to disease.
c. degenerative diseases characterized by deterioration of the body organs.
d. the characteristic of a diet that provides all the essential nutrients, fiber, and energy necessary to maintain health and body weight.
e. the dietary characteristic of providing foods of a number of types in proportion to each other.
f. management of food energy intake.
g. a measure of the nutrients a food provides relative to the energy it provides.
h. providing enough, but not too much, of a substance.
i. eating a wide selection of foods within and among the major food groups.
j. illness transmitted to human beings through food and water, caused either by an infectious agent or a poisonous substance.

B. Write the letter for the appropriate definition beside each term.

1. _____ Daily Values
2. _____ discretionary kcalorie allowance
3. _____ food group plan
4. _____ health claims
5. _____ legumes
6. _____ structure-function claims
7. _____ USDA Food Guide

a. dietary planning tool that sorts foods into groups based on nutrient content and then specifies that people should eat certain amounts of food from each group.
b. the USDA’s food group plan for ensuring dietary adequacy that assigns foods to five major food groups.
c. plants of the bean and pea family.
d. the kcalories remaining in a person’s energy allowance after consuming enough nutrient-dense foods to meet all nutrient needs for a day.
e. reference values developed by the FDA specifically for use on food labels.
f. statements that characterize the relationship between a nutrient or other substance in food and a disease or health-related condition.
g. statements that describe how a product may affect a structure or function of the body.

Discussion

Answer the following questions on a separate sheet of paper. See the answer key for correct responses or examples.

1. A friend has told you that they drink two glasses of orange juice a day, and therefore they are adequately meeting the My Pyramid guidelines. What should your reaction be?
2. Stephanie is a 40-year-old divorced working mother with 2 elementary-age children who attend after-school care until she picks them up at 5:00. She admits to using a lot of convenience foods and take-out. She has noticed that both her children have recently gained more weight than they should. Identify some lifestyle factors that may account for their weight gain and some possible options to help the family eat healthier.

3. Compare a regular commercial bakery product, such as brownies, with a commercial low-fat variety. What are the differences?

4. Identify three things that are different on the USDA “My Pyramid” in comparison to the 1992 Food Guide Pyramid.
Answer Key

Multiple Choice

1. d (p. 3)  9.  b (p. 21)  17.  c (p. 30)  25.  d (p. 30)
2. a (p. 6)  10.  c (p. 22)  18.  b (p. 7)  26.  c (p. 12)
3. d (p. 7)  11.  a (p. 23)  19.  d (p. 4)  27.  b (p. 20)
4. d (p. 8)  12.  a (p. 24)  20.  a (p. 4)  28.  d (p. 12)
5. a (p. 14)  13.  d (p. 26)  21.  b (p. 16)  29.  a (p. 13)
6. b (pp. 18, 20)  14.  b (p. 27)  22.  a (p. 17)  30.  c (p. 36)
7. c (p. 12)  15.  b (p. 29)  23.  d (p. 20)
8. a (p. 21)  16.  d (p. 29)  24.  c (p. 29)

Fill-in-the-Blank Exercises

A. Fill-in summary

1. foods
2. health (AMDR)
3. balance
4. time
5. nutrition
6. nutrients
7. maintenance
8. water
9. minerals
10. energy-yielding
11. energy
12. store
13. kcalories
14. Dietary Reference Intakes (DRI)
15. Estimating Energy Requirements (EER)
16. physical activity
17. Acceptable Macronutrient Distribution Ranges
18. protein
19. consumption
20. status
21. Healthy People 2010
22. diet
23. nutrients
24. energy
25. nutrient-dense
26. health
27. varied
28. eat
29. physical activity
30. chronic
31. 30 minutes
32. day
33. 60 minutes
34. body weight
35. physical fitness
36. Food Guide
37. adequate
38. food group
39. flexibility
40. Food Guide
41. nutrient-dense
42. discretionary kcalorie allowance
43. kcalories
44. MyPyramid
45. Dietary Guidelines
46. Food Guide
47. Food labels
48. goals
49. Daily Values
50. FDA
51. Health claims
52. scientific evidence
53. Health claims
54. less conclusive
55. evidence

B. Fill-in table

<table>
<thead>
<tr>
<th>High-fat item</th>
<th>Low-fat substitute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkey cold cut</td>
<td>Roasted turkey breast</td>
</tr>
<tr>
<td>Commercial blue cheese salad dressing</td>
<td>Homemade version with low-fat mayonnaise and sour cream</td>
</tr>
<tr>
<td>Commercial cream of broccoli soup</td>
<td>Homemade version with evaporated skim milk thickened with water and flour</td>
</tr>
<tr>
<td>Grilled Rueben sandwich</td>
<td>Broiled, open-faced Rueben, made with lean corned beef</td>
</tr>
</tbody>
</table>

Word Problems

1. 1 cup skim milk = 11.88 g CHO x 4 kcal/g = 48 kcal
   3 ounces grilled chicken breast, boneless = 0.00 g x 4 = 0
   1 medium roll = 43.00 g x 4 = 172
   1 teaspoon mayonnaise = 3.51 g x 4 = 14
   ½ cup apple sauce = 27.55 g x 4 = 110
   Total kcal from carbohydrates = 48 + 0 + 172 + 14 + 110 = 344 kcal
2. 1 cup tossed salad = 2 vegetables; 1 cup of chili = 1 vegetable; ½ cup rice = 1 grain; 
½ cup steamed spinach = 1 vegetable; 1 piece of corn bread = 1 grain

3. AMDR for CHO = 45-65% of kcal; CHO contains 4 kcal/g
   \[1500 \text{ kcal} \times .45 = 675 \text{ kcal} / 4 = 168.75 \text{ g}\]
   \[1500 \text{ kcal} \times .65 = 975 \text{ kcal} / 4 = 243.75 \text{ g}\]
   You should consume 169-244 grams carbohydrate.

Matching

<table>
<thead>
<tr>
<th>Set A</th>
<th>4. j</th>
<th>8. g</th>
<th>5. f</th>
<th>9. b</th>
<th>1. e</th>
<th>6. a</th>
<th>10. i</th>
<th>2. d</th>
<th>7. h</th>
<th>3. c</th>
</tr>
</thead>
</table>

Discussion

1. Although they are getting their two cups per day, they need to vary their sources and only half or less of the fruit they consume should be from juice. So a cup of orange juice and a banana would be a better choice.

2. **Stephanie:** lack of time or knowledge, possible lack of interest in cooking
   **Children:** lack of activity, consuming too many high-fat and high-kcalorie foods
   **Solutions:** Find an in-house child care provider who can start meals and keep the children active. Plan meals, shop and do some preparation of meals on weekends, making this a family activity. Find out what the snacks and exercise activities are like at after-school care, ensuring that they are health promoting.

3. **Sample answer:** regular brownies vs. low-fat brownies
   Fat: regular = 2.5 g, low-fat = 0 g
   Sugar: regular = 23 g, low-fat = 27 g
   Kcal: regular = 170 kcal, low-fat = 110 kcal
   Sodium: regular = 170 g, low-fat = 140 g
   **Conclusion:** There really are no significant differences between the two brownies.

4. **Sample answer:**
   1. **Activity guidelines:** MyPyramid recommends 30 minutes/day, minimum; Food Guide Pyramid made no recommendation
   2. **Fruit intake:** MyPyramid recommends 2 cups (for a 2000-kcal diet), variety, less than half juice; Food Guide Pyramid recommended 1.5 cups, eat whole fruit more than juice
   3. **Fats/oils:** MyPyramid recommends 6 teaspoons of oil, choose most from nuts, fish and vegetables, solid fats count as discretionary kcal; Food Guide Pyramid recommended that the person limit fats and oils; use unsaturated vegetable oils and margarines that list liquid vegetable oils as first ingredients on label