Chapter 02 - Carbohydrates

True / False

1. When carbohydrates are plentiful, the human brain depends almost exclusively on them as an energy source.

a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

2. Most fiber-rich foods are kcalorie-free.

a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

3. A person consumes 2600 kcalories per day and 50 grams of carbohydrate from concentrated sweets. According to the USDA Food Patterns recommendations, this person's sugar intake is within the guidelines.

a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 Health Effects of Sugars and Alternative Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

4. Experts agree that moderate amounts of sugar in the diet may pose a number of major health risks.

a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Alternative Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

5. A person consumes 2000 kcalories per day and 200 grams of carbohydrate. This person meets the current dietary recommendations for carbohydrate intake.

a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Health Effects of Starch and Dietary Fiber

LEARNING OBJECTIVES: NUTR.DEBR. 16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

6. Cindy consumed 2 servings of vegetables, 2 servings of fruit, 5 servings of whole grains, and 2 servings of legumes during the day. Cindy meets the DV recommendation for fiber for the day.

a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

7. There are no health consequences associated with consuming excess fiber.

a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

8. All plant foods have attributes that may reduce the risks of colon and rectal cancers.

a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

9. Carbohydrate-rich foods are equal in the degree to which they elevate both blood glucose and insulin concentrations.

a. True
b. False

ANSWER: False
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.5. The Glycemic Index in Nutrition Practice
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.5 - Describe the glycemic index and explain why its use in disease prevention is controversial.

10. Sugar consumption is a major cause of tooth decay.

a. True
b. False

ANSWER: True
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 Health Effects of Sugars and Alternative Sweeteners

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

Multiple Choice

11. The main function of carbohydrates in the body is to _____.
    a. furnish the body with energy
    b. provide material for synthesizing cell walls
    c. synthesize fat
    d. insulate the body to prevent heat loss
    e. build mitochondria

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

12. Which carbohydrate is composed of a single sugar unit?
    a. starch
    b. glycogen
    c. sucrose
    d. some fibers
    e. fructose

ANSWER: e
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

13. The _____ are the basic units of all carbohydrates.
    a. monosaccharides
    b. disaccharides
    c. polysaccharides
    d. sucrose molecules
    e. insoluble fibers

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

14. Three monosaccharides important in nutrition are _____.
    a. glucose, lactose, and fructose
    b. fructose, glucose, and sucrose
    c. maltose, fructose, and lactose

d. galactose, sucrose, and lactose
e. fructose, glucose, and galactose

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

15. The primary source of energy for most cells in the body under normal conditions is _____.
a. sucrose
b. amino acids
c. fructose
d. glucose
e. fatty acids

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

16. The hormone that moves glucose from the blood into the cells is _____.
a. glucagon
b. insulin
c. testosterone
d. sucrose
e. glycogen

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 2.2 Regulation of Blood Glucose
LEARNING OBJECTIVES: NUTR.DEBR.16.02. 2.2 - Explain how hormones control blood glucose concentrations.

17. Which of the following does not come exclusively from plants?
a. glucose
b. maltose
c. fructose
d. galactose
e. sucrose

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

18. Fructose is _____.
a. the sweetest of the sugars

b. known as milk sugar
c. abundant in whole grains
d. also known as dextrose
e. a starch

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

19. Fructose occurs naturally in _____.

a. bread
b. milk
c. meats
d. fruits
e. fiber

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

20. Which monosaccharide is typically found as a part of a disaccharide?

a. glucose
b. fructose
c. maltose
d. galactose
e. starch

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

21. Which compound is a disaccharide?

a. glucose
b. fructose
c. lactose
d. galactose
e. glycogen

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

22. Sucrose is never referred to as _____.

a. white sugar
b. milk sugar
c. table sugar
d. cane sugar
e. beet sugar

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

23. The most familiar source of sucrose is _____.

a. bread
b. table sugar
c. fiber
d. meat
e. honey

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

24. The principle sweetener in cakes and cookies is _____.

a. fructose
b. galactose
c. maltose
d. sucrose
e. starch

ANSWER: d
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

25. One molecule of sucrose contains _____ molecule(s) of glucose.

a. one
b. two
c. three
d. four
e. five

ANSWER: a
DIFFICULTY: Bloom's: Understand

REFERENCES: 2.1 The Chemist's View of Carbohydrates

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

26. Which of the following is the principal carbohydrate in milk?

a. maltose
b. fructose
c. sucrose
d. lactose
e. glucose

ANSWER: d

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.1 The Chemist's View of Carbohydrates

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

27. Chemically, lactose is a _____.

a. monosaccharide
b. disaccharide
c. dextrose
d. polysaccharide
e. starch

ANSWER: b

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.1 The Chemist's View of Carbohydrates

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

28. An example of a polysaccharide is _____.

a. starch
b. lactose
c. simple carbohydrates
d. protein
e. fat

ANSWER: a

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.1 The Chemist's View of Carbohydrates

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

29. Which of the following carbohydrates is a monosaccharide?

a. maltose
b. fructose
c. sucrose
d. lactose

e. glycogen

ANSWER: b

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.1 The Chemist's View of Carbohydrates

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

30. The stored form of glucose in the body is called _____.

a. glycogen
b. insulin
c. fat
d. muscle
e. mitochondria

ANSWER: a

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.1 The Chemist's View of Carbohydrates

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

31. Polysaccharides are composed almost entirely of _____ units.

a. sucrose
b. fructose
c. maltose
d. glucose
e. galactose

ANSWER: d

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.1 The Chemist's View of Carbohydrates

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

32. Excess glucose in the blood is converted into glycogen and stored primarily in the _____.

a. brain and liver
b. liver and muscles
c. blood cells and brain
d. pancreas and brain
e. brain and muscles

ANSWER: b

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.1 The Chemist's View of Carbohydrates

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

33. The richest sources of starch are _____.

a. fruits

b. grains
c. vegetables
d. soybeans
e. meat

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

34. Whole grains, vegetables, legumes, and fruits are rich sources of _____.
a. sucrose
b. dietary fiber
c. fat
d. glycogen
e. glucagon

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

35. Cellulose, pectin, hemicellulose, and gums are all considered _____.
a. artificial sweeteners
b. sugar alcohols
c. dietary fibers
d. simple carbohydrates
e. resistant starches

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

36. Which dietary fiber is found in all vegetables, fruits, and legumes?
a. hemicellulose
b. pectin
c. mucilage
d. cellulose
e. gum

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

37. Which fiber is a nonpolysaccharide?

a. cellulose
b. lignin
c. pectin
d. gum
e. lignite

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

38. The _____are not used by the food industry as additives or stabilizers because they are the tough, woody parts of plants.

a. pectins
b. gums
c. lignins
d. mucilages
e. resistant starches

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

39. Fibers that escape digestion and absorption in the small intestine are known as _____.

a. resistant starches
b. monosaccharides
c. soluble fibers
d. disaccharides
e. viscous gels

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

40. Fibers are categorized by _____.

a. the number of chemical bonds that hold them together
b. their chemical and physical properties
c. the number of hydrogen molecules they contain
d. their ability to be digested by human enzymes
e. their kcaloric density

ANSWER: b

DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

41. Sugars in fruits, vegetables, grains, and milk _____.
    a. are not related to one another chemically
    b. are considered discretionary kcalories
    c. occur naturally
    d. are usually resistant to digestion
    e. must be added to make the foods palatable

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

42. The steady upward trend in sugar consumption among Americans can be attributed to _____.
    a. people adding more sugar to their foods
    b. food manufacturers adding sugar during processing
    c. better food preservation techniques
    d. improved food safety practices
    e. an increase in Type 1 diabetes

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

43. The leading source of added sugar in the American diet is _____.
    a. baked goods such as cookies and cakes
    b. fresh fruits
    c. sugary soft drinks
    d. chocolate bars and other candy treats
    e. ice cream and other frozen treats

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

44. According to the World Health Organization's recommendations, no more than _____% of daily kcalories should come from added sugars.
    a. 5
    b. 10

c. 15
d. 20
e. 35

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

45. Which of the following statements best describes the role of sugar in the development of obesity?
a. Sugar consumption is a direct cause of weight gain leading to obesity.
b. The increased use of added sugars by food manufacturers is the cause of obesity.
c. Sugar contributes to obesity when it's overconsumption is part of overall excessive energy intake.
d. Sugar is converted directly to fat as soon as it is consumed.
e. Sugar is much less important in the development of obesity than the lack of adequate exercise.

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

46. Excessive sugar consumption contributes to the development of _____.
a. cancer
b. type 1 diabetes
c. dental caries
d. hyperactive behavior in children
e. hyperactive behavior in adults

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

47. Which food ingredient is a sugar alcohol?
a. polydextrose
b. maltitol
c. cellulose
d. aspartame
e. glucagon

ANSWER: b
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

48. How many kcalories are provided by 100 grams of carbohydrate?

a. 100
b. 200
c. 300
d. 400
e. 500

ANSWER: d
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

49. Sweeteners that yield energy are called _____.

a. nutritive sweeteners
b. artificial sweeteners
c. resistant sweeteners
d. glycemic sweeteners
e. fermented sweeteners

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

Ice Cream
A carton of ice cream contains the following list of ingredients: milkfat and nonfat milk, sorbitol, pecans, cellulose, butter, caramel color, citric acid, aspartame, carrageenan.

50. Refer to the "*Ice Cream*" box above. How many *alternative* sweeteners are contained in this product?

a. 1
b. 2
c. 3
d. 4
e. 5

ANSWER: b
DIFFICULTY: Bloom's: Analyze
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

Ice Cream
A carton of ice cream contains the following list of ingredients: milkfat and nonfat milk, sorbitol, pecans, cellulose, butter, caramel color, citric acid, aspartame, carrageenan.

51. Refer to the "*Ice Cream*" box above. How many *artificial* sweeteners are contained in the product?

a. 1
b. 2
c. 3
d. 4
e. 5

ANSWER: a
DIFFICULTY: Bloom's: Analyze
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

52. The artificial sweetener sucralose is made from _____.

a. sucrose
b. amino acids
c. aspartame
d. maltose
e. galactose

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

53. The artificial sweetener that is similar in structure to fructose is _____.

a. tagatose
b. neotame
c. sucralose
d. stevia
e. saccharin

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

54. Which item would you recommend to someone interested in lowering his or her blood cholesterol level?

a. white bread
b. oatmeal
c. corn flakes
d. pork
e. coffee

ANSWER: b
DIFFICULTY: Bloom's: Apply

REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

55. Soluble fiber can help reduce blood cholesterol levels by _____
    a. converting cholesterol into vitamin D
    b. binding cholesterol and carrying it out of the body with the feces
    c. blocking the absorption of bile
    d. preventing the production of bile
    e. blocking the production of insulin

ANSWER: b

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

56. While fiber has many benefits, it does not aid in _____.
    a. weight management
    b. lowering the risk of type 2 of diabetes
    c. overall health of the gastrointestinal tract
    d. the prevention of osteoporosis
    e. regulating cholesterol

ANSWER: d

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

57. The _____ describes the effect a food has on blood glucose levels.
    a. glycemic index
    b. insulin index
    c. solubility factor
    d. viscosity index
    e. energy index

ANSWER: a

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.5 The Glycemic Index in Nutrition Practice

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.5 - Describe the glycemic index and explain why its use in disease prevention is controversial.

58. Soluble fibers are found in _____.
    a. celery strings, wheat bran hulls, and corn kernel skins
    b. kidney beans, apples, and oatmeal
    c. corn kernel skins, apples, and sunflower seeds
    d. celery strings, soybeans, and bran flakes

e. celery strings, apples, and sunflower seeds

ANSWER: b

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.1 The Chemist's View of Carbohydrates

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

59. Which is the most effective at alleviating constipation?

a. cellulose
b. pectin
c. gums
d. psyllium
e. protein

ANSWER: a

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

60. Carbohydrates should contribute approximately _____% of the total daily energy intake.

a. 35-40
b. 25-40
c. 45-65
d. 70--75
e. 15-25

ANSWER: c

DIFFICULTY: Bloom's: Understand

REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

61. A 2000-kcalorie diet that provides 175 grams of carbohydrate provides _____.

a. inadequate carbohydrate
b. excessive carbohydrate
c. an appropriate amount of carbohydrate
d. inadequate fiber
e. inadequate fat

ANSWER: a

DIFFICULTY: Bloom's: Apply

REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

62. The Dietary Reference Intake for dietary fiber is approximately _____ grams per day.

a. 10-15

b. 15-20
c. 25-35
d. 45-50
e. 55-60

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

63. Grains, legumes, and root vegetables contain predominantly _____.
a. simple sugars and fiber
b. starches and fiber
c. fat and fiber
d. simple sugars and fat
e. fat and starches

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

64. Which list of foods are richest in carbohydrates?
a. eggs, cheese, and milk
b. rice, broccoli, and apples
c. milk, nuts, and oils
d. mayonnaise, butter, and salad dressing
e. eggs, apples, and broccoli

ANSWER: b
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

65. Which group contains the fewest carbohydrates?
a. grains and starchy vegetables
b. nuts and dried fruits
c. milk and cheese
d. fruits and vegetables
e. meat and nuts

ANSWER: c
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

66. Jeff consumed the following foods for a meal: small baked potato, ½ cup of carrots, 1 cup skim milk, and 1 small banana. Approximately how many grams of carbohydrate did Jeff consume?

a. 47
b. 57
c. 66
d. 69
e. 89

ANSWER: a
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

67. A valid concern about excessive sugar consumption is _____.

a. an increased risk for developing cancer
b. its contribution to behavioral problems in children
c. the potential for malnutrition
d. an increased risk for developing hypertension
e. an increased reliance on fast foods for nutrients

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

68. High-fructose corn syrup is composed of _____.

a. fructose and glucose
b. glucose and galactose
c. sucrose and maltitol
d. fructose and galactose
e. sucrose and syrulose

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

69. Which of the following is the equivalent of 1 teaspoon of white sugar?

a. 1 tablespoon of ketchup
b. 1 tablespoon of jelly
c. 2 oz. of a carbonated soft drink
d. 3 teaspoons of honey
e. 1 teaspoon of milk

ANSWER: a

DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

70. Aspartame is made from _____.
a. sucrose
b. fructose
c. two amino acids
d. two monosaccharides
e. sucrose and dextralose

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

71. The World Health Organization set an upper limit for fiber intake at _____ grams per day.
a. 30
b. 40
c. 50
d. 60
e. 70

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

72. The glycemic index ranks carbohydrate foods based on how they impact _____.
a. blood glucose and insulin levels
b. blood pressure
c. weight
d. blood cholesterol and triglyceride levels
e. resting heart rate

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.5 The Glycemic Index in Nutrition Practice
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.5 - Describe the glycemic index and explain why its use in disease prevention is controversial.

73. The glycemic index of a food is measured by comparing the increase in one's blood glucose levels after consuming the food to that caused by a reference food such as _____.
a. white bread
b. a banana

c. ice cream
d. oatmeal
e. cheese

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.5 The Glycemic Index in Nutrition Practice
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.5 - Describe the glycemic index and explain why its use in disease prevention is controversial.

74. Which of the following breakfast foods has the lowest glycemic index?
a. cornflakes
b. instant oatmeal
c. white bagel
d. cooked oatmeal
e. orange juice

ANSWER: d
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.5 The Glycemic Index in Nutrition Practice
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.5 - Describe the glycemic index and explain why its use in disease prevention is controversial.

75. The glycemic index of a food is influenced by _____.
a. structure of the starch
b. vitamin content in the food
c. the temperature of the food
d. time of day the food is consumed
e. one's body weight

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.5 The Glycemic Index in Nutrition Practice
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.5 - Describe the glycemic index and explain why its use in disease prevention is controversial.

76. People with _____ may benefit from limiting their intake of high-glycemic index foods.
a. heart disease
b. arthritis
c. diabetes
d. migraine headaches
e. anorexia

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.5 The Glycemic Index in Nutrition Practice
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.5 - Describe the glycemic index and explain why its use in disease prevention is controversial.

77. What is the glycemic load (GL) of one cup of kidney beans, which contains 40g of carbohydrate and has a glycemic index of 24?

a. 9.6
b. 960
c. 40
d. 24
e. 4

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.5 The Glycemic Index in Nutrition Practice
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.5 - Describe the glycemic index and explain why its use in disease prevention is controversial.

78. The colon's bacteria ferment soluble fibers, forming small fatlike molecules that lower the _____.

a. the starch factor
b. fiber content in the food
c. glycemic index
d. pH
e. one's body weight

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

79. Insulin _____ blood glucose uptake by the muscles and adipose tissue.

a. depresses
b. impedes
c. facilitates
d. stops
e. uncontrollably speeds

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.2 Regulation of Blood Glucose
LEARNING OBJECTIVES: NUTR.DEBR.16.02. 2.2 - Explain how hormones control blood glucose concentrations.

80. The glycogen molecule is _____ branched with _____ ends bristling from each molecule's surface.

a. highly; hundreds of
b. weakly; ten
c. thinly; two
d. highly; thousands of
e. un-; no

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 2.2 Regulation of Blood Glucose

LEARNING OBJECTIVES: NUTR.DEBR.16.02. 2.2 - Explain how hormones control blood glucose concentrations.

Matching

a. a hormone secreted by the pancreas in response to high blood glucose; promotes cellular glucose uptake.
b. a hormone that is secreted by special cells in the pancreas in response to low blood glucose concentration; elicits release of glucose from storage.
c. a measure of the extent to which a food raises the blood glucose concentration and elicits an insulin response, as compared with pure glucose.
d. the more common type of diabetes in which the fat cells resist insulin.
e. indigestible food components that readily dissolve in water and often impart gummy or gel-like characteristics to foods.
f. having a gel-like consistency.
g. the tough, fibrous structures of fruits, vegetables, and grains; indigestible food components that do not dissolve in water.
h. the amount of an nonnutritive sweetener that individuals can safely consume each day over the course of a lifetime without adverse effect.
i. sweeteners that yield energy, including both the sugars and the sugar alcohols.
j. the concentration of hydrogen ions.

DIFFICULTY: Bloom's: Remember

REFERENCES: 2.1 The Chemist's View of Carbohydrates
2.2 Regulation of Blood Glucose
2.3 Health Effects of Sugars and Artificial Sweeteners
2.4 Health Effects of Starch and Dietary Fibers

LEARNING OBJECTIVES: NUTR.DEBR.16.02. 2.2 - Explain how hormones control blood glucose concentrations.
NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.
NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.
NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

81. Acceptable Daily Intake (ADI)
ANSWER: h

82. glucagon
ANSWER: b

83. glycemic response
ANSWER: c

84. insoluble fibers
ANSWER: g

85. insulin
ANSWER: a

86. soluble fibers
ANSWER: e

87. type 2 diabetes
ANSWER: d

88. viscous
ANSWER: f

89. pH
ANSWER: j

90. nutritive sweeteners
ANSWER: i

Essay

91. Of all the possible alternatives, why are carbohydrates the preferred energy source?
ANSWER: As long as carbohydrate is available, the human brain depends exclusively on it as an energy source. Most cells depend on glucose for their fuel to some extent, and the cells of the brain and the rest of the nervous system depend almost exclusively on glucose for their energy.
DIFFICULTY: Bloom's: Apply
REFERENCES: 2.1 The Chemist's View of Carbohydrates
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.1 - Identify the monosaccharides, disaccharides, and polysaccharides common in nutrition and list their major food sources.

92. How would you respond to the statement that honey is more nutritious than white sugar?
ANSWER: People often ask: What is the difference between honey and white sugar? Is honey, by virtue of being natural, more nutritious? Honey, like white sugar, contains glucose and fructose. The difference is that, in white sugar, the glucose and fructose are bonded together in pairs, whereas in honey some of them are paired and some are free single sugars. When you eat either white sugar or honey, though, your body breaks all of the sugars apart into single sugars. It ultimately makes no difference, then, whether you eat single sugars linked together, as in white sugar, or the same sugars unlinked, as in honey; they will end up as single sugars in your body. Honey does contain a few vitamins and minerals, but not many.

Honey is denser than crystalline sugar, too, so it provides more energy per spoonful. Table 2-2 shows that honey and white sugar are similar nutritionally—and both fall short of milk, legumes, fruits, grains, and vegetables. Honey may offer some health benefits, however: It seems to relieve nighttime coughing in children and reduce the severity of mouth ulcers in cancer patients undergoing chemotherapy or radiation.

DIFFICULTY: Bloom's: Apply
REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners
LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

93. Compare and contrast the advantages and disadvantages of nutritive sweeteners (sugar alcohols) vs. nonnutritive sweeteners.
ANSWER: The sugar alcohols occur naturally in fruits and vegetables; they are also used by manufacturers to provide sweetness and bulk to cookies, sugarless gum, hard candies, and jams and jellies. Unlike sucrose, sugar alcohols are fermented in the large intestine by intestinal bacteria. Consequently, side

effects such as gas, abdominal discomfort, and diarrhea make the sugar alcohols less attractive than the nonnutritive sweeteners. The advantage of using sugar alcohols is that they do not contribute to dental caries.
The nonnutritive sweeteners sweeten with minimal or no carbohydrate or energy. The human taste buds perceive many of them as extremely sweet so just tiny amounts are added to foods to achieve the desired sweet taste. The FDA endorses nonnutritive sweeteners as safe for use over a lifetime within Acceptable Daily Intake (ADI) levels. Like the sugar alcohols, nonnutritive sweeteners make foods taste sweet without promoting tooth decay.

DIFFICULTY: Bloom's: Analyze

REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

94. Describe how fiber-rich foods help with weight control.

ANSWER: Fiber-rich foods tend to be low in fat and added sugars and therefore prevent weight gain and promote weight loss by delivering less energy per bite. In addition, fibers absorb water from the digestive juices; as they swell, they create feelings of fullness, delay hunger, and reduce food intake. Soluble fibers may be especially useful for appetite control. By whatever mechanism, as populations eat more refined low-fiber foods and concentrated sweets, body fat stores creep up. In contrast, people who eat three or more ounces of whole grain foods each day tend to have lower body and abdominal fatness over time. Commercial weight-loss products often contain bulk-inducing fibers such as methylcellulose, but pure fiber compounds are not advised. High-fiber foods not only add bulk to the diet but are economical, are nutritious, and supply health-promoting phytochemicals—benefits that no purified fiber preparation can match.

DIFFICULTY: Bloom's: Apply

REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

95. Discuss the harmful effects of excessive fiber intake.

ANSWER: Despite fiber's benefits to health, when too much fiber is consumed, some minerals may bind to it and be excreted with it, without becoming available for the body to use. When mineral intake is adequate, however, a reasonable intake of high-fiber foods does not seem to compromise mineral balance. People with marginal intakes who eat mostly high-fiber foods may not be able to take in enough food to meet energy or nutrient needs. The malnourished, the elderly, and young children adhering to all-plant (vegan) diets are especially vulnerable to this problem. Fibers also carry water out of the body and can cause dehydration. Advise clients to add an extra glass or two of water to go along with the fiber added to their diets. Athletes may want to avoid bulky, fiber-rich foods just prior to competition.

DIFFICULTY: Bloom's: Remember

REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

96. Given the nutrient information on food labels, how can the number of grams of starch in a food product be determined?

ANSWER:

Nutrition labels typically include a gram amount and percent daily value of Dietary Fiber. These are listed in the Total Carbohydrate section. Starch- and fiber-rich foods will have higher values than non-

fiber-rich foods. The FDA authorizes four health claims on food labels concerning fiber-rich carbohydrate foods. One is for "fiber-containing grain products, fruits, and vegetables and reduced risk of cancer." Another is for "fruits, vegetables, and grain products that contain fiber, and reduced risk of coronary heart disease." A third is for "soluble fiber from whole oats and from psyllium seed husk and reduced risk of coronary heart disease," and a fourth is for "whole grains and reduced risk of heart disease and certain cancers."

The DRI committee advises that carbohydrates should contribute about half (45 to 65 percent) of the energy requirement. A person consuming 2000 kcalories a day should therefore obtain 900 to 1300 kcalories' worth of carbohydrate, or between 225 and 325 grams. This amount is more than adequate to meet the RDA for carbohydrate, which is set at 130 grams per day based on the average minimum amount of glucose used by the brain. When it established the Daily Values that appear on food labels, the FDA used a guideline of 60 percent of kcalories in setting the Daily Value for carbohydrate at 300 grams per day. For most people, this means increasing total carbohydrate intake. To this end, the Dietary Guidelines for Americans encourage people to choose fiber-rich whole grains, vegetables, fruits, and legumes daily. Recommendations for fiber encourage the same foods just mentioned: whole grains, vegetables, fruits, and legumes, which also provide vitamins, minerals, and phytochemicals. The FDA set the Daily Value for fiber at 28 grams for a 2000-kcalorie intake. This is based on the DRI recommendation of 14 grams per 1000-kcalorie intake—roughly 25 to 35 grams of dietary fiber daily. These recommendations are almost two times higher than the usual intake in the United States. As health care professionals, you can advise your clients that an effective way to add dietary fiber while lowering fat is to substitute plant sources of proteins (legumes) for some of the animal sources of protein (meats and cheeses) in the diet. Another way to add fiber is to encourage clients to consume the recommended amounts of fruits and vegetables each day. People choosing high-fiber foods are wise to seek out a variety of fiber sources and to drink extra fluids to help the fiber do its job. Many foods provide fiber in varying amounts.

DIFFICULTY: Bloom's: Analyze

REFERENCES: 2.4 Health Effects of Starch and Dietary Fibers

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.4 - Identify the health benefits of, and recommendations for, starches and fibers.

97. Differentiate between added sugars and naturally occurring sugars.

ANSWER: Most of the energy people receive from foods comes from carbohydrates. Healthy choices provide carbohydrates rich in fiber, starches, vitamins, minerals, and naturally occurring sugars. A diet that is consistently low in dietary fiber and high in added sugar can lead to health problems. Some sugar sources are more nutritious than others, though. Consider a fruit such as an orange. The orange provides the same sugars and about the same energy as a tablespoon of sugar or honey, but the packaging makes a big difference in nutrient density. The sugars of the orange are diluted in a large volume of fluid that contains valuable vitamins and minerals, and the flesh and skin of the orange are supported by fibers that also offer health benefits. A tablespoon of honey offers no such bonuses. Of course, a cola beverage, containing many teaspoons of sugar, offers no advantages either.

DIFFICULTY: Bloom's: Analyze

REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

98. Does high-fructose corn syrup contribute to obesity more than other types of sugar? Explain your answer.

ANSWER: Over the past several decades, as obesity rates increased sharply, consumption of added sugars reached an all-time high—largely because high-fructose corn syrup use, especially in beverages, surged. High-fructose corn syrup is composed of fructose and glucose in a ratio of about 50:50. Compared with sucrose, high-fructose corn syrup is less expensive, easier to use, and more stable. In

addition to being used in beverages, high-fructose corn syrup sweetens candies, baked goods, and hundreds of other foods. The use of high-fructose corn syrup sweetener parallels unprecedented increases in the incidence of obesity, but does this mean that the increasing sugar intakes are responsible for the increase in body fat and its associated health problems? Excess sugar in the diet may be associated with more fat on the body. When they are eaten in excess of need, energy from added sugars contributes to body fat stores, raising the risk of weight gain. When total energy intake is controlled, however, moderate amounts of sugar do not cause obesity. Thus, to the extent that sugar contributes to an excessive energy intake, it can play a role in the development of obesity.

Because swallowing liquids requires little effort, the liquid form of sugar in soft drinks makes it especially easy to overconsume kcalories. Sugar-sweetened beverages are energy-dense, providing more than 150 kcalories per 12 ounce can, and many people drink several cans a day. The sugar kcalories of sweet beverages also cost less than many other energy sources, and they are widely available. The convenience, economy, availability, and flavors of sugary foods and beverages encourage overconsumption.

Limiting selections of foods and beverages high in added sugars can be an effective weight-loss strategy, especially for people whose excess kcalories come primarily from added sugars. Replacing a can of cola with a glass of water every day, for example, can help a person lose a pound (or at least not gain a pound) in one month. That may not sound like much, but it adds up to more than 10 pounds a year, for very little effort.

DIFFICULTY: Bloom's: Apply

REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

99. How safe are nonnutritive sweeteners?

ANSWER: Through the years, questions have emerged about the safety of nonnutritive sweeteners, but these issues have since been resolved. For example, early research indicating that large quantities of saccharin caused bladder tumors in laboratory animals was later shown to be inapplicable to humans. Common sense dictates that consuming large amounts of saccharin is probably not safe, but consuming moderate amounts poses no known hazard. Aspartame, a sweetener made from two amino acids (phenylalanine and aspartic acid) is one of the most thoroughly studied food additives ever approved, and no scientific evidence supports the Internet stories that accuse it of causing disease. However, aspartame's phenylalanine base poses a threat to those with the inherited disease phenylketonuria (PKU). People with PKU cannot dispose of phenylalanine efficiently. Food labels warn people with PKU of the presence of phenylalanine in aspartame-sweetened foods. In addition, foods and drinks containing nonnutritive sweeteners have no place in the diets of even healthy infants or toddlers.

DIFFICULTY: Bloom's: Analyze

REFERENCES: 2.3 Health Effects of Sugars and Artificial Sweeteners

LEARNING OBJECTIVES: NUTR.DEBR.16.02.2.3 - Describe how added sugars can contribute to health problems and how alternative sweeteners may help to limit kcalories and sugar intake.

100. Do you think people should avoid consumption of high-glycemic index foods?

ANSWER: Some people assume that starchy foods such as breads and potatoes should be avoided due to their high GI values. As mentioned earlier, these foods are rarely consumed in isolation, and their GI values are reduced in a mixed meal. For example, breads often have a GI greater than 70, but adding cheese or peanut butter reduces the GI to 55 or 59, respectively. Also worth considering is that GI values often vary considerably. For example, published values for white potatoes range from 24 to 101, and

	many samples have values in the mid-50s. For these reasons and others, more studies are needed to confirm whether the GI is practical or beneficial for healthy people.
DIFFICULTY:	Bloom's: Analyze
REFERENCES:	2.5 The Glycemic Index in Nutrition Practice
LEARNING OBJECTIVES:	NUTR.DEBR.16.02.2.5 - Describe the glycemic index and explain why its use in disease prevention is controversial.