

Chapter 3: Carbohydrates

Schlenker & Long: Williams' Essentials of Nutrition & Diet Therapy: 10th Edition

MULTIPLE CHOICE

1. One of the major reasons why carbohydrates play a major role in nutrition is because they:
 1. are widely available.
 2. are absorbed in the stomach.
 3. provide a ready source of vitamins and minerals.
 4. can be eaten without special preparation.

ANS: 1

Carbohydrates provide a staple part of the food supply throughout the world. Foods such as rice, pasta, bread, and potatoes provide an affordable and abundant source of energy. The preferred source of carbohydrate in any area depends on climate, culture, and economics. Carbohydrates are absorbed in the small intestine, not the stomach. Starch-based and whole-grain carbohydrate foods often provide vitamins and minerals, but refined foods and those high in sugar may not. Some carbohydrate foods can be eaten without special preparation (e.g., bread or crackers), but others require cooking (e.g., potatoes, rice, and pasta).

PTS: 1 DIF: Easy REF: p. 44
MSC: Type of Question: Application

2. Ingredients necessary for photosynthesis to occur include carbon dioxide, water, and:
 1. glucose.
 2. nitrogen.
 3. chlorophyll.
 4. hydrogen.

ANS: 3 PTS: 1 DIF: Easy REF: p. 44
MSC: Type of Question: Knowledge

3. Carbohydrates are composed of a combination of carbon, hydrogen, and:
 1. oxygen.
 2. nitrogen.
 3. water.
 4. glucose.

ANS: 1 PTS: 1 DIF: Easy REF: p. 44
MSC: Type of Question: Knowledge

4. The process of photosynthesis is responsible for the synthesis of:
 1. carbohydrates.
 2. proteins.
 3. fats.
 4. vitamins.

ANS: 1 PTS: 1 DIF: Easy REF: p. 44
MSC: Type of Question: Knowledge

5. The sugar to which all other sugars are converted during human metabolism is:
1. sucrose.
 2. fructose.
 3. glucose.
 4. maltose.

ANS: 3 PTS: 1 DIF: Easy REF: p. 46
MSC: Type of Question: Knowledge

6. The body organ that synthesizes lactose is the:
1. liver.
 2. breast.
 3. kidneys.
 4. pancreas.

ANS: 2
The body only produces lactose during lactation. Breastfeeding mothers produce lactose in the breast as part of milk production.

PTS: 1 DIF: Medium REF: p. 46
MSC: Type of Question: Application

7. The preferred fuel of the cells lining the colon is:
1. short-chain fatty acids.
 2. long-chain fatty acids.
 3. amino acids.
 4. glucose.

ANS: 1 PTS: 1 DIF: Hard REF: p. 48
MSC: Type of Question: Knowledge

8. People with phenylketonuria should avoid foods made with the nonnutritive sweetener:
1. acesulfame-K.
 2. aspartame.
 3. saccharin.
 4. sucralose.

ANS: 2
People with phenylketonuria are unable to metabolize the amino acid phenylalanine. Amounts in excess of their body's need accumulate in their blood, leading to brain damage. They need to eat only the amount of phenylalanine needed for their body to make essential proteins. Aspartame contains phenylalanine, and so people with phenylketonuria should avoid foods made with this sweetener.

PTS: 1 DIF: Easy REF: p. 51
MSC: Type of Question: Application

9. A mineral that helps strengthen tooth enamel and prevent dental caries is:
1. calcium.
 2. phosphorus.
 3. fluoride.

4. zinc.

ANS: 3 PTS: 1 DIF: Easy REF: p. 53
MSC: Type of Question: Knowledge

10. The type of fiber that is not a carbohydrate is:

1. gums.
2. lignin.
3. pectin.
4. cellulose.

ANS: 2 PTS: 1 DIF: Medium REF: p. 54
MSC: Type of Question: Knowledge

11. An example of a food that contains functional fiber is:

1. applesauce.
2. oat bran muffin.
3. jam made with pectin.
4. carrot and raisin salad.

ANS: 3

All of these foods contain fiber. Functional fiber is fiber that is added, rather than naturally present in a food. The addition of pectin to jam allows the jam to set, but also adds functional fiber.

PTS: 1 DIF: Medium REF: p. 55
MSC: Type of Question: Application

12. Of the following sugars, the one that tastes the sweetest is:

1. glucose.
2. sucrose.
3. galactose.
4. fructose.

ANS: 4 PTS: 1 DIF: Medium REF: p. 44
MSC: Type of Question: Knowledge

13. Fructose is the sugar found in:

1. bread.
2. gelatin desserts.
3. sugar-coated cereals.
4. honey and fruit.

ANS: 4 PTS: 1 DIF: Easy REF: p. 44
MSC: Type of Question: Knowledge

14. A monosaccharide that only occurs naturally in foods in combination with another sugar as a disaccharide is:

1. fructose.
2. galactose.
3. sucrose.
4. maltose.

ANS: 2 PTS: 1 DIF: Medium REF: p. 46
MSC: Type of Question: Knowledge

15. A person with lactose intolerance should limit the intake of:
1. milk.
 2. yogurt.
 3. cheese.
 4. corn syrup.

ANS: 1

Milk contains lactose. Much of the lactose is fermented to form lactic acid when milk is made into yogurt and so yogurt contains relatively little lactose. Cheese is made by curdling milk to separate the curds and whey. The whey contains the lactose and is drained off. The curds are used to make cheese and are low in lactose. Corn syrup does not contain lactose.

PTS: 1 DIF: Medium REF: p. 46
MSC: Type of Question: Application

16. Sucrose consists of a combination of glucose and:
1. maltose.
 2. fructose.
 3. galactose.
 4. lactose.

ANS: 2 PTS: 1 DIF: Medium REF: p. 46
MSC: Type of Question: Knowledge

17. With respect to its effect on colon microflora, fiber is considered a:
1. prebiotic.
 2. probiotic.
 3. functional food.
 4. protective agent.

ANS: 1

Prebiotics are substances that promote and provide food substrates for beneficial bacteria in the colon. Fiber is one of these substances. Probiotics actually contain beneficial bacteria. Functional foods are specific foods that contain nutrients or other substances that have health benefits. Foods that contain fiber may be examples of functional foods, but fiber itself is not. Fiber does have protective effects in the colon, but this is not a recognized term.

PTS: 1 DIF: Medium REF: p. 56
MSC: Type of Question: Application

18. The most important monosaccharides in human nutrition include glucose, fructose, and:
1. lactose.
 2. galactose.
 3. maltose.
 4. sucrose.

ANS: 2 PTS: 1 DIF: Medium REF: p. 45
MSC: Type of Question: Knowledge

19. An example of a disaccharide is:

1. glucose.
2. fructose.
3. galactose.
4. maltose.

ANS: 4 PTS: 1 DIF: Medium REF: p. 46
MSC: Type of Question: Knowledge

20. The most prevalent dietary disaccharide is:

1. lactose.
2. fructose.
3. sucrose.
4. galactose.

ANS: 3 PTS: 1 DIF: Medium REF: p. 46
MSC: Type of Question: Knowledge

21. Sugar alcohols are likely to be found in:

1. fermented foods.
2. low-calorie foods.
3. fruits and vegetables.
4. fiber supplements.

ANS: 2

Sugar alcohols are added to foods like chewing gum to provide sweetness with fewer calories and without promoting dental caries. They are not produced in foods by natural fermentation, found naturally in fruits and vegetables, or added to fiber supplements.

PTS: 1 DIF: Hard REF: p. 47
MSC: Type of Question: Application

22. Foods that are major sources of starch include:

1. fruits.
2. meats.
3. legumes.
4. milk.

ANS: 3

Fruits contain sugar, but not starch. Meats contain only minimal amounts of any type of carbohydrate. Milk contains lactose, a sugar, but no starch. Legumes contain abundant amounts of starch.

PTS: 1 DIF: Medium REF: p. 48
MSC: Type of Question: Application

23. Starch that is not digested in the small intestine is known as:

1. refined.
2. functional.
3. raw.
4. resistant.

ANS: 4 PTS: 1 DIF: Hard REF: p. 48

MSC: Type of Question: Knowledge

24. In the colon, resistant starch is digested by:
1. bacterial fermentation.
 2. pancreatic amylase.
 3. hydrochloric acid.
 4. villi and microvilli.

ANS: 1 PTS: 1 DIF: Medium REF: p. 48
MSC: Type of Question: Knowledge

25. According to the 2005 *Dietary Guidelines for Americans*, daily intake of added sugar should be no more than:
1. 2 tsp.
 2. 5 tsp.
 3. 8 tsp.
 4. 12 tsp.

ANS: 3 PTS: 1 DIF: Medium REF: p. 49
MSC: Type of Question: Knowledge

26. Storage sites for glycogen in the human body include the liver and the:
1. heart.
 2. muscles.
 3. intestine.
 4. pancreas.

ANS: 2 PTS: 1 DIF: Medium REF: p. 48
MSC: Type of Question: Knowledge

27. The type of carbohydrate that helps maintain normal blood glucose levels during fasting periods is:
1. glucose.
 2. galactose.
 3. dextrans.
 4. glycogen.

ANS: 4 PTS: 1 DIF: Medium REF: p. 48
MSC: Type of Question: Knowledge

28. To prevent symptoms of fatigue, dehydration, and energy loss, the daily recommended minimum intake of carbohydrate should be:
1. 130 g.
 2. 230 g.
 3. 330 g.
 4. 430 g.

ANS: 1 PTS: 1 DIF: Medium REF: p. 50
MSC: Type of Question: Knowledge

29. Dextrans are:
1. polysaccharides.
 2. end products of starch digestion.

3. formed in the liver.
4. rapidly excreted.

ANS: 1 PTS: 1 DIF: Medium REF: p. 48
MSC: Type of Question: Knowledge

30. Oligosaccharides:
1. contain 3 to 10 monosaccharides.
 2. contain large portions of partially digested starch.
 3. are used as nonnutritive sweeteners.
 4. are used for weight management.

ANS: 1 PTS: 1 DIF: Medium REF: p. 48
MSC: Type of Question: Knowledge

31. An oligosaccharide that may be fermented to produce gas in the intestinal tract is:
1. raffinose.
 2. dextrin.
 3. maltose.
 4. starch.

ANS: 1 PTS: 1 DIF: Medium REF: p. 48
MSC: Type of Question: Knowledge

32. Whole wheat bread, popcorn, baked beans, bananas, and pears are good sources of:
1. cellulose.
 2. gums.
 3. collagen.
 4. psyllium.

ANS: 1 PTS: 1 DIF: Hard REF: p. 54
MSC: Type of Question: Knowledge

33. Fiber's capacity to hold water is related to its ability to decrease development of:
1. kidney stones.
 2. diverticula.
 3. high blood cholesterol levels.
 4. type 2 diabetes.

ANS: 2 PTS: 1 DIF: Medium REF: p. 56
MSC: Type of Question: Knowledge

34. Functional foods have health benefits related to their content of:
1. phytochemicals.
 2. resistant starch.
 3. functional fiber.
 4. oligosaccharides.

ANS: 1 PTS: 1 DIF: Medium REF: p. 56
MSC: Type of Question: Knowledge

35. Total fiber intake consists of:
1. resistant starch and dietary fiber.

2. dietary fiber and functional fiber.
3. animal fiber and vegetable fiber.
4. oligosaccharides and plant fiber.

ANS: 2 PTS: 1 DIF: Medium REF: p. 54
MSC: Type of Question: Knowledge

36. Fiber can lower blood levels of:
1. cholesterol.
 2. triglycerides.
 3. sodium.
 4. calcium.

ANS: 1 PTS: 1 DIF: Hard REF: p. 53
MSC: Type of Question: Knowledge

37. The new Dietary Reference Intake (DRI) for fiber:
1. is higher for men than women.
 2. is higher for older people than younger people.
 3. is the same for all adults.
 4. requires that adults use fiber supplements.

ANS: 1 PTS: 1 DIF: Medium REF: p. 56
MSC: Type of Question: Knowledge

38. Good food sources of fiber include:
1. whole grains.
 2. meats.
 3. canned fruits.
 4. tomato juice.

ANS: 1

Whole grains include the outer covering of the grain, rich in fiber. Animal foods, such as meat, do not contain fiber. Canned fruits are lower in fiber than fresh fruits because they do not include the peel and some fiber is lost in processing. Fruit and vegetable juices contain little fiber because the fibrous part of the plant is left behind.

PTS: 1 DIF: Medium REF: p. 49
MSC: Type of Question: Application

39. Foods high in fiber slow the rise in blood glucose following a meal because they:
1. are poorly digested.
 2. are high in phytochemicals.
 3. have a low glycemic index.
 4. have a high glycemic index.

ANS: 3 PTS: 1 DIF: Hard REF: p. 56
MSC: Type of Question: Knowledge

40. Sufficient dietary carbohydrate intake prevents formation of excess:
1. ketones.
 2. ammonia.
 3. urea.

4. fat.

ANS: 1 PTS: 1 DIF: Medium REF: p. 49
MSC: Type of Question: Knowledge

41. Popular low-carbohydrate diets may place an extra burden on:

1. the heart.
2. the kidneys.
3. muscles.
4. the pancreas.

ANS: 2

Diets low in carbohydrate tend to be high in protein. Extra protein has to be broken down by the liver and excreted by the kidneys.

PTS: 1 DIF: Hard REF: p. 54
MSC: Type of Question: Application

42. The mechanism that is essential for the absorption of monosaccharides is:

1. phosphorylation.
2. active transport.
3. passive diffusion.
4. facilitated diffusion.

ANS: 2 PTS: 1 DIF: Hard REF: p. 57
MSC: Type of Question: Knowledge

43. An organ in the body that requires glucose as fuel is the:

1. kidney.
2. liver.
3. brain.
4. heart.

ANS: 3 PTS: 1 DIF: Medium REF: p. 49
MSC: Type of Question: Knowledge

44. The enzyme produced by the parotid gland is:

1. salivary amylase.
2. sucrase.
3. maltase.
4. lactase.

ANS: 1 PTS: 1 DIF: Easy REF: p. 57
MSC: Type of Question: Knowledge

45. Carbohydrate is stored in the body in the form of:

1. starch.
2. polysaccharide.
3. glycogen.
4. glucagon.

ANS: 3 PTS: 1 DIF: Medium REF: p. 48
MSC: Type of Question: Knowledge

46. The sum of the physical and chemical processes that take place in a living organism to maintain life and produce energy is called:
1. metabolism.
 2. digestion.
 3. phosphorylation.
 4. hydrolysis.

ANS: 1 PTS: 1 DIF: Easy REF: p. 47
MSC: Type of Question: Knowledge

47. When monosaccharides are absorbed into the intestinal bloodstream, they enter the:
1. general circulation for transport to the cells.
 2. portal circulation for transport to the liver.
 3. pulmonary circulation for transport to the heart.
 4. lymphatic circulation for transport to the cells.

ANS: 2 PTS: 1 DIF: Medium REF: p. 57
MSC: Type of Question: Knowledge

48. The body organ responsible for the metabolic processing of glucose is the:
1. large intestine.
 2. gallbladder.
 3. pancreas.
 4. liver.

ANS: 4 PTS: 1 DIF: Medium REF: p. 57
MSC: Type of Question: Knowledge