

STUDY QUESTIONS, Chapter 4- Part 2 The Carbohydrates: Sugar, Starch, Glycogen & Fiber

For the next questions read the introduction to Chapter 4 as well as the section with the heading “**A Close look at Carbohydrates**”.

1. Where do root cells get their energy to grow?
 - a) From photosynthesis in the roots
 - b) From glucose produced during photosynthesis in the leaves
2. Which sugar tastes the most intensely sweet?
 - a) glucose
 - b) fructose
 - c) galactose
 - d) sucrose
3. Which of the above sugars is digested by enzymes in your intestinal cells?
4. Starch is a plant's storage form of what? _____
5. So why does a plant want to make starch and put it in its seeds?
6. Glycogen is an animal's storage form of what? _____
7. Which of the following is a correct statement:
 - a) Glycogen is abundant in foods like meat.
 - b) Glycogen is nearly undetectable in meats.
8. According to this section, what is one reason a plant wants to make fiber?

For the next questions, read the section with the heading “**The Need for Carbohydrates**”.

9. This section says that _____ bind to cell membranes, affecting cellular interactions that may play a role in disease processes.
10. Foods rich in soluble fibers lower blood cholesterol by binding with _____-containing bile in the small intestine and carrying it out with the feces”.

11. Look at the TABLE in this section called “Characteristics, Sources and Health Effects of Fibers”. According to this TABLE, which food would be most likely to help alleviate constipation?
- Oat bran
 - Wheat bran
12. Look at the FIGURE in this section called “Fiber Composition of Common Foods”. Which food appears to be the highest in fiber?
- Fruits
 - Vegetables
 - Legumes (Beans)
 - Grains
13. Look at the FIGURE in this section called “One Way Fiber in Food May Lower Cholesterol in Blood”. What happens on the left side of that diagram (High Fiber Diet) that does NOT happen on the right side of that diagram (Low Fiber Diet)?

To answer the following questions, read the **CONSUMER CORNER** in Chapter 4, called “Refined, Enriched and Whole-Grain Bread”.

14. Which part of the wheat kernel (the seed) grows into a wheat plant?
- _____
15. What **two** nutrients does the endosperm contain that nourish the sprout as it begins growing?
16. Look at the TABLE in this section called “Terms that Describe Grain Foods”. Read the definition given there of the word “refined”. Why is the *first* ingredient in the “Natural Wheat Bread pictured in the FIGURE in this section called “ Bread Labels Compared” considered to be a “refined” ingredient? Choose the BEST statement:
- That ingredient is considered refined, according to the text definition, because it is processed.
 - That ingredient is considered refined, according to the text definition, because nutrients are added to it.
 - That ingredient is considered refined, according to the text definition, because the bran and germ have been removed, leaving only a portion of the original plant.

To answer the next questions, read the section of this chapter called "**From Carbohydrates [in food] to Glucose**". (10th edition, after the CONSUMER CORNER you just looked at, 11th edition before the CONSUMER CORNER)

17. Read through the paragraphs with the heading "Digestion and Absorption of Carbohydrate". Which of the following statements made in this section is incorrect?
- Some maltose from starch in food is liberated in the mouth.
 - Salivary enzyme is deactivated by stomach acid.
 - One enzyme that digests protein is not deactivated by stomach acid.
 - Starch digestion resumes in the small intestine (S.I.).
 - Starch in white bread breaks down rapidly and the glucose is absorbed high in the S.I.
 - Starch in cooked beans digests more slowly.
 - The disaccharides sucrose, lactose and maltose are split by enzymes attached to cells of the lining of the small intestine.
 - Absorbed monosaccharides travel in the blood to the liver which converts fructose and galactose to glucose or related products.
 - Glucose can then travel in the blood to cells all over the body where the glucose may be split for energy.
 - Many fibers can be digested by enzymes in the small intestine.
18. Look at the FIGURE in this section called "How Carbohydrate in Food Becomes Glucose in the Body". What type of carbohydrate does it show entering capillaries?
- monosaccharides
 - disaccharides
 - only glucose

Read the section of the text with the heading called "**The Body's Use of Glucose**".

19. According to this section, which of the following are problems when the body faces a severe carbohydrate deficit?
- The body must turn to protein to make glucose.
 - The body must use significant amounts of fat to make glucose.
 - Ketosis may occur which has many potential consequences for the body.
20. In this same section, under the title, "The Glycemic Response" can the glycemic index be relied upon with certainty in managing diabetes or reducing risk of disease?

Read the **FOOD FEATURE** near the end of Chapter 4 called "Finding the Carbohydrates in Foods".

21. Where does molasses get the iron (in a form not-easily absorbed) that it has?
22. Look at the TABLE in this section called "Terms That Describe Sugar". Then look at the TABLE in this section called "The Empty Calories of Sugar". Why is concentrated grape juice sweetener considered an "empty-calorie food"?

For the next questions, read *Controversy 4* “**Sugar and Alternative Sweeteners: Are They Bad for You?**” (At the very end of chapter 4)

23. According to the section of *Controversy 4* with the heading “Does Sugar Cause Dental Caries?”, why might a snack of saltine crackers promote cavities?
24. According to this controversy, which of the following sweeteners are considered safe by the FDA and are present in foods?
- Saccharin
 - Aspartame
 - Sucralose
 - Acesulfame-potassium
 - Stevia
 - Neotame
25. According to the Center for Science in the Public Interest, which of the following sweeteners do they feel are NOT safe, and should be avoided? (To find this info go to: <http://www.cspinet.org/reports/chemcuisine.htm>) **Note:** CSPI is a group that has been a strong advocate for nutrition and health, food safety, alcohol policy, and sound science since 1971.
- Saccharin
 - Aspartame
 - Sucralose
 - Acesulfame-potassium
 - Stevia
 - neotame

The following questions are from the lecture outline for Chapter 4 Part 2.

26. Which of these are considered to be carbohydrates?
- Sugar
 - Starch
 - Fiber
 - Bread
 - Potatoes
27. Which of these are considered to be simple carbohydrates?
- Monosaccharides
 - Disaccharides
 - Polysaccharides
28. What do the structures of all 3 disaccharides have in common?

29. Which type of sugar is in *honey*? (See also” Food Sources and Health Benefits of Macronutrients” document posted in moodle for help.)
- Monosaccharides
 - Disaccharides
30. Which type of sugar is in *table sugar*? (See also” Food Sources and Health Benefits of Macronutrients” document posted in moodle for help.)
- Monosaccharides
 - Disaccharides
31. Using information in the **Lecture 4A** Video Clip called “Starch”, calculate how many grams of **starch** are in a serving of the Ak Mak crackers in the “Labels” document posted in moodle. _____

Read about the growing, harvesting and processing of dry edible beans. (See Plants and Macronutrients document posted in moodle)

32. This says that a food like a pinto bean is actually the plant’s _____ in the pod.
33. At the beginning, it says that beans are excellent sources of what 3 **macronutrients**?
34. For what does it say the bean plant uses the insoluble fiber for? _____
35. It says that beans are LOW in what macronutrient? _____
36. Then read about oats, rice and corn. Go on to read about Sugarbeets. Where in the U.S. does it say most sugarbeet seeds are produced?
37. Go on to read about the processing of sugarbeets to extract sugar. From reading this, why is table sugar made from sugarbeets considered a “refined” food? (You can review TABLE in the CONSUMER CORNER in this chapter that you already looked at called “Terms that Describe Grain Foods”).
- Because it is processed.
 - Because it has added nutrients.
 - Because most of the beet was removed. All you are getting is the sugar that was in the beet.

You will need to look at the “Nutritional Labels” document in moodle to answer the following questions:

38. A serving of the beans (look at bean label in label document) has 18 grams of total carbohydrate. Six grams of that 18 grams of carbohydrate is fiber and 0 grams is sugar. What kind of carbohydrate is the remaining 12 grams? _____

39. Using the “magic DV”, what nutrients are these beans considered a **good source** of? (See the first page of Chapter 2's Lecture Outline.)
- _____

Look at the Snapple label in the label document.

40. The **NUTRITION FACTS** on this label are for how much of the Snapple?
- _____

41. The **entire bottle** of the Snapple is how much? _____

42. If you drank the **entire bottle**, how many teaspoons of sugar would you be getting? (see Chapter 4 Part 2 Lecture Outline **Processing of Foods With Carbohydrate**)

43. Consider a snack of Ak Mak crackers. The cracker **ingredients** include 100% stone ground whole wheat flour, water, honey (made of fructose and glucose), sesame oil, sesame seeds, yeast and salt. (See label document)

What **carbohydrates**, in that snack of Ak Mak crackers would you say need to be **enzymatically** digested? See the handout **Food Sources of Macronutrients and also Lecuture Outline** for help.

a) Starch	e) Galactose
b) Glucose	f) Sucrose
c) Maltose	g) Fructose
d) Lactose	h) Fiber

44. After eating this snack of Ak Mak crackers, what carbohydrates are absorbed into the cells lining SI (& then lymph or blood)?

a) Starch	e) Galactose
b) Glucose	f) Sucrose
c) Maltose	g) Fructose
d) Lactose	h) Fiber

45. **PRINTOUT QUESTIONS.** Take a look at the Nutrient Intake printout from the analysis you did last week of your 1-day of food records. Answer the following question.

If you got enough fiber answer the following questions:

How many grams of fiber did you have?

What was the recommendation of fiber for you? _____

Based on the information in this chapter, what do you think were the TWO foods that gave **you** the most **fiber**? _____

If you did not get enough fiber, go to the MyPyramid Tracker site and adjust your intake for that day with foods you like to see if you can bring up your fiber intake. (*Log in then click on calendar then click where it says Proceed to Food Intake*) See example below. You have to click on the exact day you entered food records, so hopefully you wrote the date down, if not take a look at your SQ 1&2 results where you wrote down what day you kept food records.

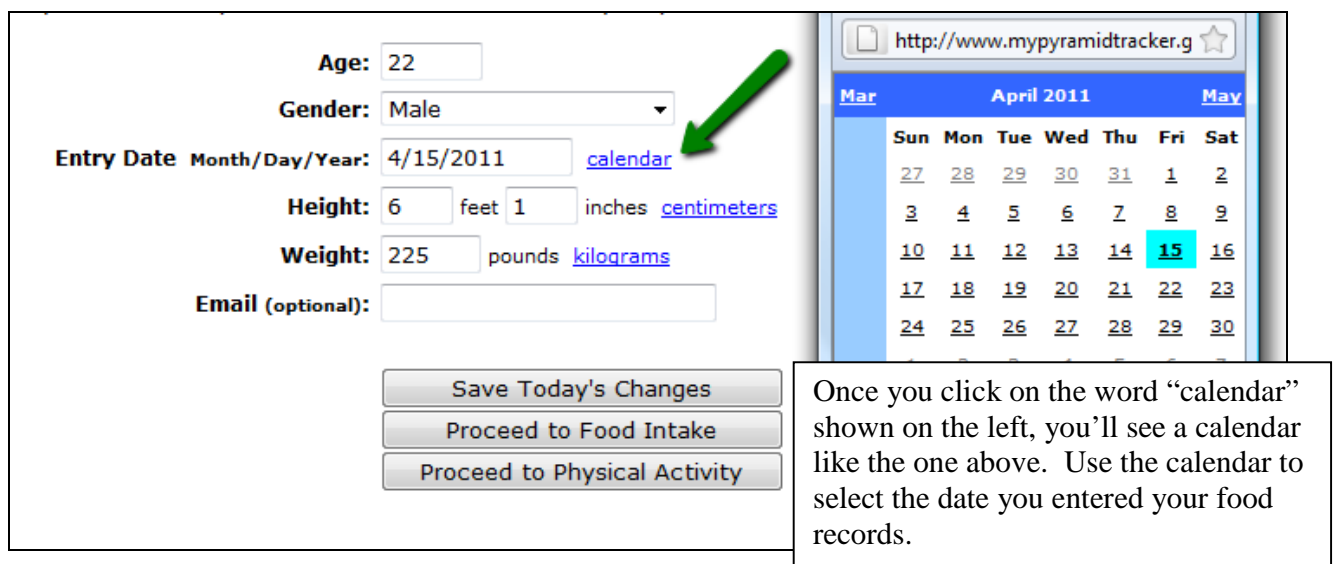
How many grams of fiber did you have?

What was the recommendation of fiber for you? _____

If you did not have enough fiber, what foods did you replace and what foods did you add? _____

What is your new total for grams of fiber you took in? _____

Were you able to reach “Recommendation or Acceptable Range”? _____



The screenshot shows the MyPyramid Tracker website interface. On the left, there is a user profile form with the following fields: Age: 22, Gender: Male, Entry Date: 4/15/2011, Height: 6 feet 1 inches, Weight: 225 pounds, and an optional email field. Below the form are three buttons: "Save Today's Changes", "Proceed to Food Intake", and "Proceed to Physical Activity". A green arrow points to the "calendar" link next to the entry date field. On the right, there is a calendar for April 2011. The date 15 (Friday) is highlighted in blue. Below the calendar, there is a text box explaining that clicking on "calendar" leads to a calendar like the one shown, and that the user should use it to select the date they entered their food records.

Once you click on the word “calendar” shown on the left, you’ll see a calendar like the one above. Use the calendar to select the date you entered your food records.

MYSTERY QUESTION(S). For this one, have in front of your Chapter 4 LECTURE OUTLINE (with your notes). You will be asked 1 or more questions about something from one of the blanks or one of the questions that are asked in the LECTURE OUTLINE and were answered in Lecture 3A or 3B.

Take a look at the FORUM for Week **3** (last week). Do you find one posting done by you? _____