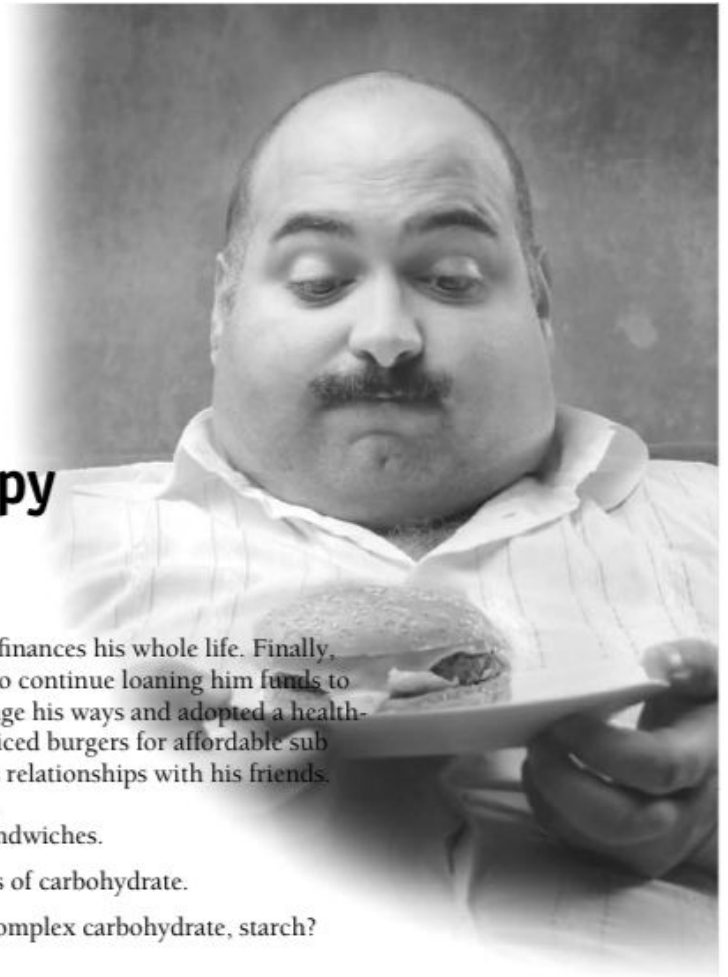


3. J. Wellington Wimpy (Basic Biochemistry)

J. Wellington Wimpy has struggled with weight and finances his whole life. Finally, his friends coordinated an intervention and refused to continue loaning him funds to feed his burger addiction. Wimpy was forced to change his ways and adopted a healthier, turkey and veggie sandwich diet. Trading overpriced burgers for affordable sub sandwiches has improved his health and repaired his relationships with his friends. Wimpy even jogs with Olive a few mornings a week.

Let's take a look at what's in Wimpy's favorite sandwiches.

1. Wimpy's 6-inch turkey sub contains 47 grams of carbohydrate.
 - a. What part of the sandwich contains the complex carbohydrate, starch?
 - b. When we digest the starch, which monosaccharides are released?
 - c. Of the 47 grams of carbohydrate in the turkey sub, 6 grams are simple sugars. When we digest the disaccharide sucrose, which monosaccharides are released?



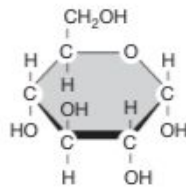


Figure 3.1. Glucose.

- d. How does your body use these carbohydrates (Figure 3.1)?
2. Wimpy's 6-inch turkey sub also contains 5 grams of dietary fiber.
 - a. Which kind of carbohydrate is this fiber?
 - b. Even though we cannot digest it, how do we benefit from fiber in our diet?
 - c. Give some examples of "simple carbohydrates" and "complex carbohydrates." Name some examples of common monosaccharides and disaccharides.
 - d. Both types of carbohydrates are used as glucose sources. Are there any differences in how these two types of carbohydrates deliver their "glucose" to the body?

- e. Which type makes glucose available more quickly?

 - f. Which type makes glucose available over a longer time period?

 - g. How are glucose polymers stored in the body?

 - h. Is there a similar mechanism of storing glucose in plants?
3. If Wimpy drinks a diet cola with his sandwich, he is not adding to the total caloric content of the meal. What can we infer about the metabolism of artificial sweeteners in Wimpy's digestive tract?
4. Wimpy's turkey sub contains 2.5 grams of fat.
- a. Fat is one kind of lipid. How many fatty acids are bound to a backbone of glycerol in each molecule of fat?

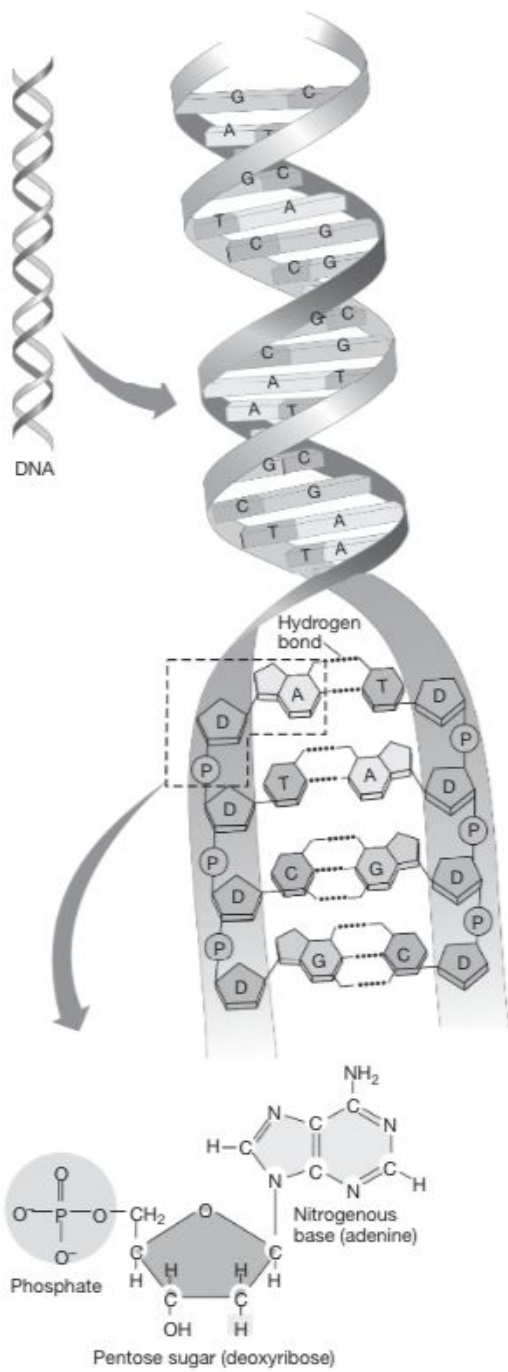


Figure 3.4. DNA.

c. Which nucleic acid is involved in energy transfer inside your cells?

9. Wimpy's subs also contain vitamin A, vitamin C, iron, and calcium. Explain how our bodies use each of these vitamins and minerals.

(Read more about this system in Daniel Chiras, *Human Biology*, 7th edition, Chapters 3 and 5.)