Name _____ Class _____ Date _____

The Effects of Food on Digestion

You are scheduled to participate in a track meet at 4:00 o'clock this afternoon. You want to do your best. And you know that a "good" meal will help you to perform well. What kind of meal is best for you? When should you eat it? In this activity you will analyze the factors that affect digestion and draw conclusions about the effects of different types of foods.

One of the first things you must realize is that you cannot get the most from foods that you have not completely digested. Foods in your stomach have not been completely digested. The process of digestion is completed in the small intestine. You must also realize that the amount of time food spends in your stomach depends on the kinds of food you have eaten. Although you cannot control the length of time that food remains in your stomach, you can control the foods you eat.

In terms of chemical makeup, foods are classified into three categories. Carbohydrates (sugars and starches) provide immediate energy for the body's activities. Proteins are used for growth and the repair of body tissues. Fats are a form of stored energy. Because stored fat must be broken down in the body's cells before it is used, stored fats are not a form of quick energy.

Table 1 presents a list of various foods. Although some of these foods contain more than one nutrient, the major nutrient in each food is shown. Table 2 shows the amount of time some of these foods remain in the stomach. Use the tables to answer the questions on the next page.

Table 1: MAJOR NUTRIENT IN VARIOUS FOODS

Food	Carbohydrate	Fat	Protein	Food	Carbohydrate	Fat	Protein
Bacon		X		Lean hamburger			X
Bread	X			Low-fat milk			X
Butter		X		Orange	X		
Cereal	X			Potato (boiled)	X		
Chicken (without skin)			X	Potato (fried or french-fried)		X	
Cream		X		Potato chips		X	
Steak			X	Spaghetti	X		

Table 2: TIME VARIOUS FOODS STAY IN THE STOMACH

Bread, spaghetti, rice, orange	2–3 hours
Chicken, lean hamburger, steak	3–4 hours
Bacon, butter, cream	4–6 hours

1. Which kind of food remains in the stomach for the longest period of time?

2. Which kind of food remains in the stomach for the shortest period of time?

3. A meal of 2 scrambled eggs, 2 slices of toast, 2 slices of bacon, and coffee with cream and sugar can remain in the stomach for up to 6 hours. A meat loaf sandwich, mashed potatoes, and coffee without cream or sugar remains in the stomach for about 4 hours. Which nutrient appears to influence the time it takes for the stomach to empty?

4. Steak and hamburger are both proteins. Steak usually remains in the stomach longer than hamburger. Suggest a reason why this is true.

5. Fried chicken usually remains in the stomach longer than broiled chicken. Explain why.

6. Why do you become hungry more quickly after a meal of cereal and toast than after a meal of bacon and eggs?

7. Becoming angry or tense while you are eating often decreases peristalsis of the stomach. What effect do these emotions have on the time food stays in the stomach?

8. It is generally desirable for an athlete to compete on an empty stomach. During vigorous exercise, the blood flow to the digestive system decreases. If food is in the stomach, the decreased flow of blood may cause cramps. Keeping in mind the roles that carbohydrates, fats, and proteins play and the amount of time each remains in the stomach, choose a menu from the list that would be best for an athlete to eat three hours before a competition. Explain your choice.

Menu 1 Cheeseburger, french fries, low-fat milk
Menu 2 Steak, potatoes, low-fat milk
Menu 3 Orange juice, cereal, low-fat milk, toast, potatoes