Holt High School Science Olympiad Invitational

Food Science



Team: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Team #: \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Student Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Part 1: General Knowledge

Match the vocabulary term to the description (1 pt per term):

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Composed of glucose and galactose.
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A fatty acid that has the maximum number of hydrogens attached to it.
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A fatty acid that does not have the maximum number of hydrogens attached.
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A fat that is from animals and not usually considered healthy.
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A mixture of these (which are usually found in flour, eggs, or milk) forms Gluten.
6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ NaHCO3 that is used to neutralize acids in food.
7. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A monosaccharide that can be mad by reducing sucrose.
8. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ A disaccharide made from two identical monomers.
9. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Substances that are extracted from plants and animals. Contain only carbon, hydrogen, and oxygen.
10. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ NaHCO3 that can cause acidity in foods.
11. (1pt) True or False: All foods are chemicals.
12. (2 pts) What chemicals are absorbed by the body during digestion? (circle all that apply)
	1. Proteins
	2. Sugars
	3. Fats
	4. Amino Acids
13. (2pts) What is the cheapest source of calories? (circle all that apply)
	1. Lipids
	2. Carbohydrate
	3. Proteins
	4. Fiber
14. (1pt) When sugar is heated past a melting point, what happens?
15. (2pts) Adding more fat to a cookie recipe would have what effect on the cookie (hint: adding more fat would be the equivalent of changing the melting point of the mixture from a mostly flour/sugar base to more of a butter/margarine base).
16. (1pt) Draw the basic structure of an amino acid (not including the R group or the variable group).
17. (3pts) Please list 3 differences between baking soda and baking powder and specify which property belongs to which substance.

1. (2pts) What is an easy way to easily recognize GMO’s in food? Why?

1. (4pts) List the 8 types of FDA labeled allergens.

1. (2pts) List 4 symptoms of an allergic attack.

1. (1pt) When burning food, what is the differences between burning food in the human body and a burning food in a calorimeter?

1. (4pts) List the two types of fiber and what they do.

Part 2: Nutritional Label

1. (1pt) There are \_\_\_\_\_\_\_\_ Calories/gram of fat.
2. (1pt) There are \_\_\_\_\_\_\_\_ Calories/gram of carbohydrate.
3. (1pt) There are \_\_\_\_\_\_\_\_ Calories/gram of protein.
4. (1pt) There are \_\_\_\_\_\_\_\_ Calories/gram of water.
5. (2pts) Calculate the calories in one sandwich.
6. (2pts) Calculate the Calories from fat in a serving.
7. (2pts) Calculate the Calories from carbohydrates.
8. (2pts) What percent of Calories are from protein in one serving?
9. (2pts) If a person needs 1,000 mg of Calcium in a day, how many mg of Calcium are in this product?

Part 3: Lab Tests

**Density Measure**

1. Using the materials provided for you, please calculate the density of the provided cake. Show all work and measurements below (3pts).

**Lipid Measure**

1. Using the provided materials, rank chips 1 through 5 on lipid content (where 5 is the most lipid content and 1 is the least). Explain your choices (3pts).

**Calorimeter Experiment**

1. Calculate the energy given off in one gram of Fritos. Include all of your work for full points. (10 pts)