

Name: _____ Date: _____ Period: _____

Digestion and Organic Molecule MCAS Questions

The following section focuses on nutrition information for dairy milk and soymilk.

Read the information below and use it to answer the four multiple-choice questions and one open-response question that follow.

Milk is an important part of many people's diets. When the word milk is mentioned, most people think of dairy milk derived from cows. Many people, however, cannot drink dairy milk because of lactose intolerance. Individuals with this condition are unable to digest a component in the milk called lactose. Lactose is the sugar in dairy milk. It is a disaccharide made from the sugars glucose and galactose. Lactose-intolerant individuals lack the enzyme lactase, which is needed for the digestion of lactose sugar.

Many lactose-intolerant individuals drink soymilk instead of dairy milk. Soymilk is produced from soybeans (the seeds of the soybean plant) and is a nutritious substitute for dairy milk. Soymilk contains protein, calcium, and other essential nutrients just as dairy milk does.

The table below compares some of the nutrition information for a serving of dairy milk and a serving of soymilk.

Dairy Milk and Soymilk Nutrition Information

Serving size	Whole Dairy Milk		Unsweetened Soymilk	
	8 oz. (240 mL)		8 oz. (240 mL)	
	Amount per Serving	% Daily Value	Amount per Serving	% Daily Value
Calories	150		90	
Total fat	8 g	12%	4 g	6%
Saturated fat	5 g	25%	0.5 g	3%
Cholesterol	35 mg	11%	0 mg	0%
Sodium	125 mg	5%	85 mg	4%
Total carbohydrates	12 g	4%	4 g	1%
Sugars	12 g		1 g	
Protein	8 g	16%	7 g	14%
Vitamin A		6%		10%
Vitamin C		10%		0%
Vitamin D		25%		30%
Calcium		30%		30%
Iron		0%		6%

1. When lactose is digested by the human body, each lactose molecule is broken down into smaller molecules. To which of the following categories of molecules do these smaller molecules belong?

- A. amino acids B. monosaccharides C. nucleic acids D. polypeptides

___ 2. Unlike dairy milk, soymilk provides some of the body's daily requirement for iron. In which of the following functions of the human body does iron serve a primary role?

- A. conducting nerve impulses B. strengthening bone structure
C. causing muscle fibers to contract D. helping transport oxygen in the blood

___ 3. Which type of milk, per serving, will theoretically yield a greater amount of ATP in the human body, and what is the reason for this?

- A. dairy milk, because it contains vitamin C
B. soymilk, because it contains no cholesterol
C. dairy milk, because it has larger amounts of sugar and fat
D. soymilk, because it has larger amounts of vitamins A and D

___ 4. Individuals with one form of lactose intolerance do not produce the enzyme lactase because the gene coding for the production of lactase is shut off in their cells. This means that which of the following processes does not occur for the gene?

- A. hydrogenation B. mutation C. replication D. transcription

Question 5 is an open-response question.

- **BE SURE TO ANSWER AND LABEL ALL PARTS OF THE QUESTION.**
- **Show all your work (diagrams, tables, or computations) in your Student Answer Booklet.**
- **If you do the work in your head, explain in writing how you did the work.**

5. The digestion of dairy milk or soymilk provides the body with important nutrients:

a. Describe how the digestive system converts the carbohydrates, proteins, and fats in dairy milk or soymilk into nutrients that can be used by cells. Include the body parts and organs involved.

b. Describe how the nutrients in the digestive system are made available to cells throughout the body after digestion has occurred. Include the body parts and organs involved.