



# More Cheese, Please

## Introduction

When Kim eats dairy products, like cheese, she often experiences lots of gas, bloating and diarrhea. However, some dairy products do not make her feel this way. She likes to eat dairy products and wants to better understand why she can eat some dairy products and not others. Help Kim figure out how her body is responding when she eats different dairy products.

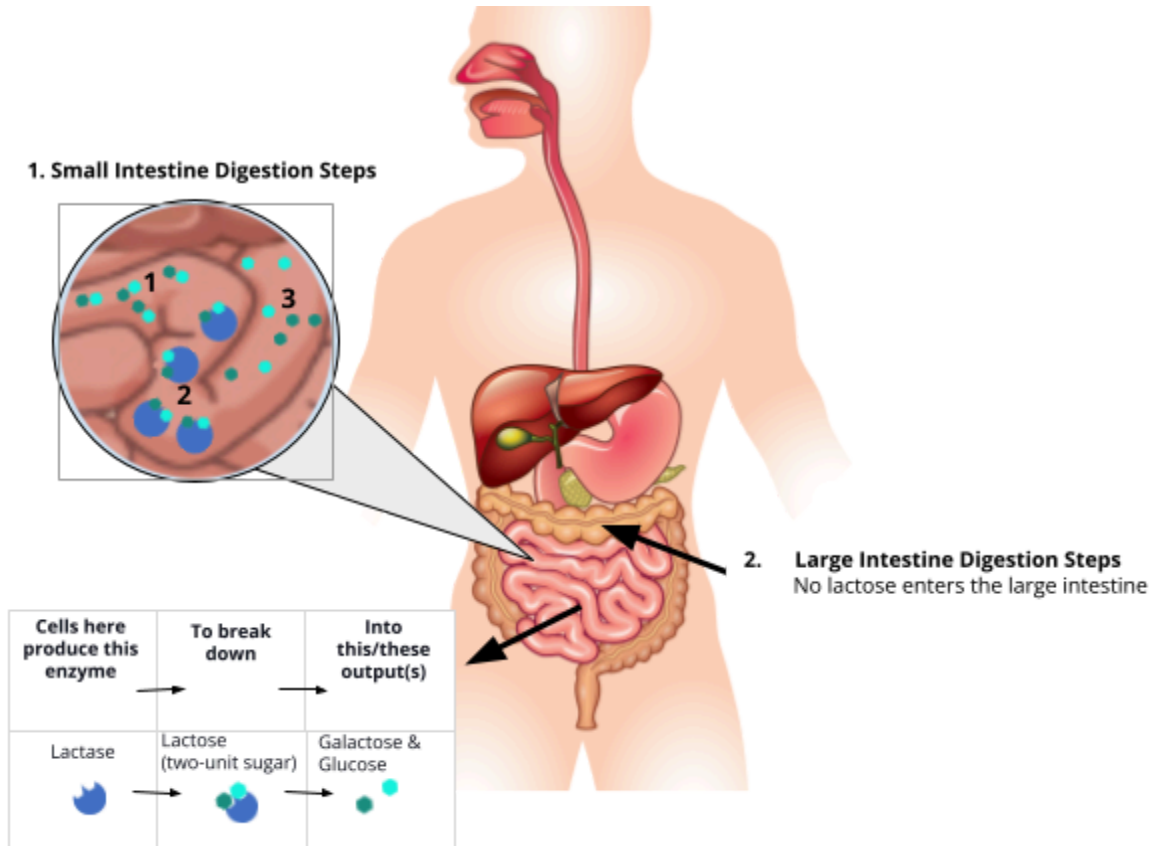
## Prompt 1

In order to understand what happens in Kim's body after she eats dairy products, let's first look at the digestive system of someone who does not experience painful symptoms after eating dairy products.

- Use Model 1 to learn about how this digestive system digests lactose, a two-unit sugar found in dairy products. This model shows two important subsystems, the small intestine and the large intestine.
- To learn more about how enzymes work, watch the [video](#).



## Model 1. How a Lactose Tolerant Person Digests Lactose



Use Model 1 to describe what is happening when a lactose tolerant person digests a dairy product. In your response, include inputs, processes, and outputs.

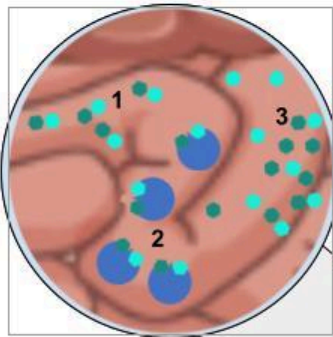


## Prompt 2

Now use Model 2 to learn about what is happening in Kim's body after she eats dairy products.

### Model 2. How a Lactose Intolerant Person Digests Lactose

#### 1. Small Intestine Digestion Steps



#### 2. Large Intestine Digestion Steps

Undigested lactose enters the large intestine and causes gas and diarrhea as it is broken down by bacteria.

Cells here produce this enzyme	To break down	Into this/these output(s)
Minimal lactase 	Only some lactose (two-unit sugar) 	Galactose & Glucose  Remaining Lactose 

Some galactose and glucose are absorbed by small intestine as nutrients.



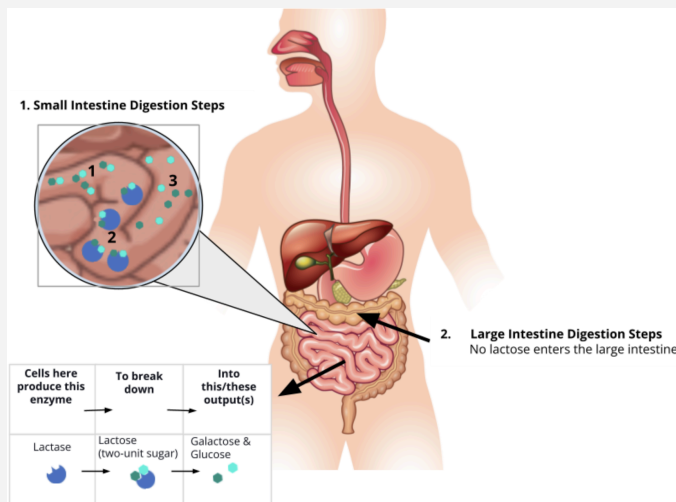
Use Model 2 to describe what is happening when a lactose intolerant person, like Kim, digests a dairy product. In your response, include inputs, processes, and outputs.

### Prompt 3

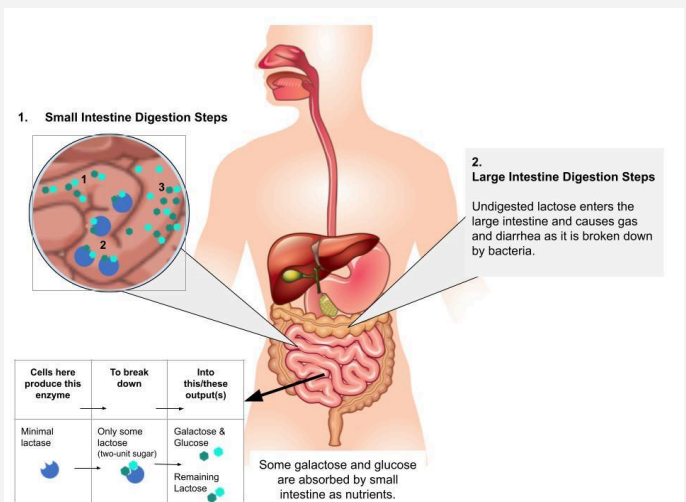
a. Create a new model that compares what is happening in a lactose tolerant versus a lactose intolerant digestive system by:

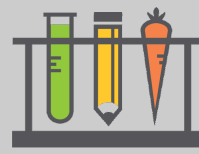
- Circling the key differences between the two digestive systems on the models below
- Writing captions to describe each difference you circle

#### Lactose Tolerant



#### Lactose Intolerant (Kim)



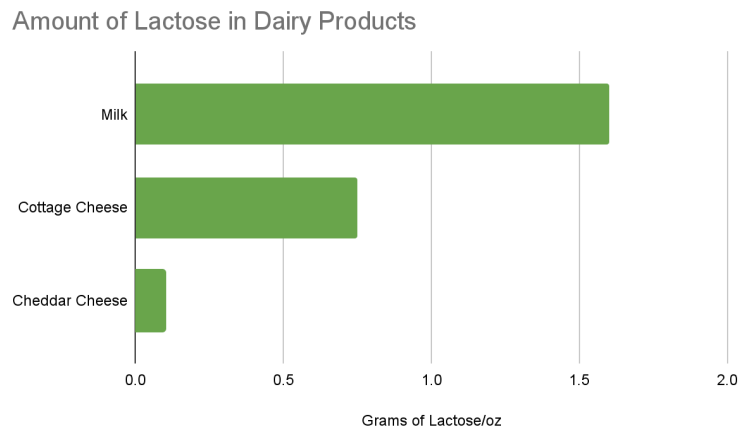


b. Use the models to explain to Kim why only lactose intolerant people experience painful symptoms like gas and diarrhea when they eat dairy products.

### Prompt 4

Now that Kim understands what is happening in her digestive system when she eats dairy products, she knows what to avoid. She does some research to find out if there are different amounts of lactose in dairy products. Review Chart 1 to identify which dairy products have the highest and lowest amounts of lactose.

**Chart 1. Amount of Lactose in Dairy Products**





a. Which dairy product has the most lactose present?

Which dairy product has the least lactose present?

b. Which dairy product would cause Kim to experience the least symptoms and why? Support your answer using the data and what you've learned about lactose intolerance.