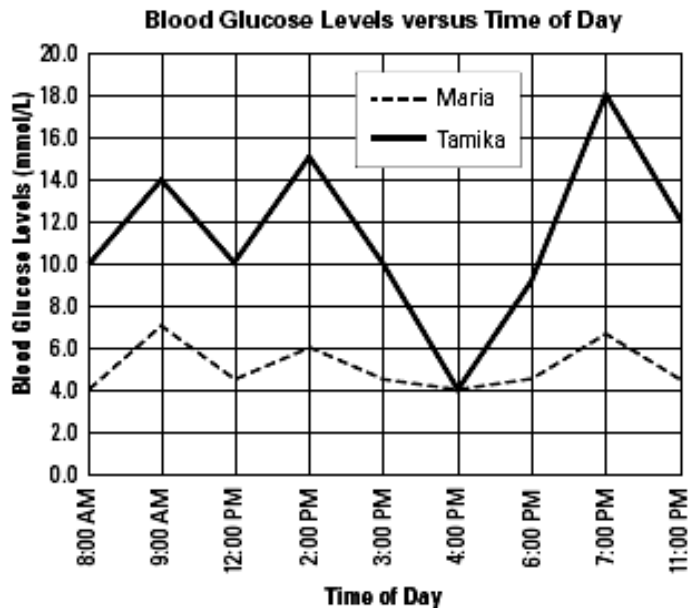


Thought Lab 13.1: Blood Glucose Regulation and Homeostasis

Answer Key

Answers to Analysis Questions

1. Your graph should look similar to the one shown below. Note: The scale for “Time” on the x-axis has been compressed to save space. This scale on your graph should be equally spaced.



2. Based on the graph, Tamika likely is diabetic. Her blood glucose levels were at 15.0 mmol/L two hours after lunch (12:00 PM) and 18.0 one hour after supper (6:00 PM). These levels are much higher than the healthy range for blood glucose of 4.5–5.0 mmol/L. Tamika's blood glucose levels decreased sharply after these measurements because she would have taken an insulin shot when the level reached above 13–15 mmol/L. Insulin circulates throughout the body and acts on specific receptors to make the target cells more permeable to glucose. Diabetes mellitus results when the body does not produce enough insulin, or does not respond properly to insulin. As a result, levels of blood glucose tend to rise sharply after meals, and remain at significantly high levels.
3. Release of insulin happens shortly after a meal. Insulin lowers blood glucose levels. Maria's blood glucose levels rise in the hour or two after a meal, then decrease because of insulin by the beginning of the next meal.
4. Glucagon levels will be higher between meals or after the person has been active. Glucagon raises blood glucose levels.
5. The woman with diabetes could take insulin to help her blood glucose levels return to healthy levels after a meal. By injecting insulin directly into the bloodstream, the insulin makes the cells more permeable to glucose, thereby lowering blood glucose levels.
6. Tamika could drink fresh fruit juice or a prepared sports drink, or eat something that contains sugar.