

APOLLO

Homeostasis

SL

Biology

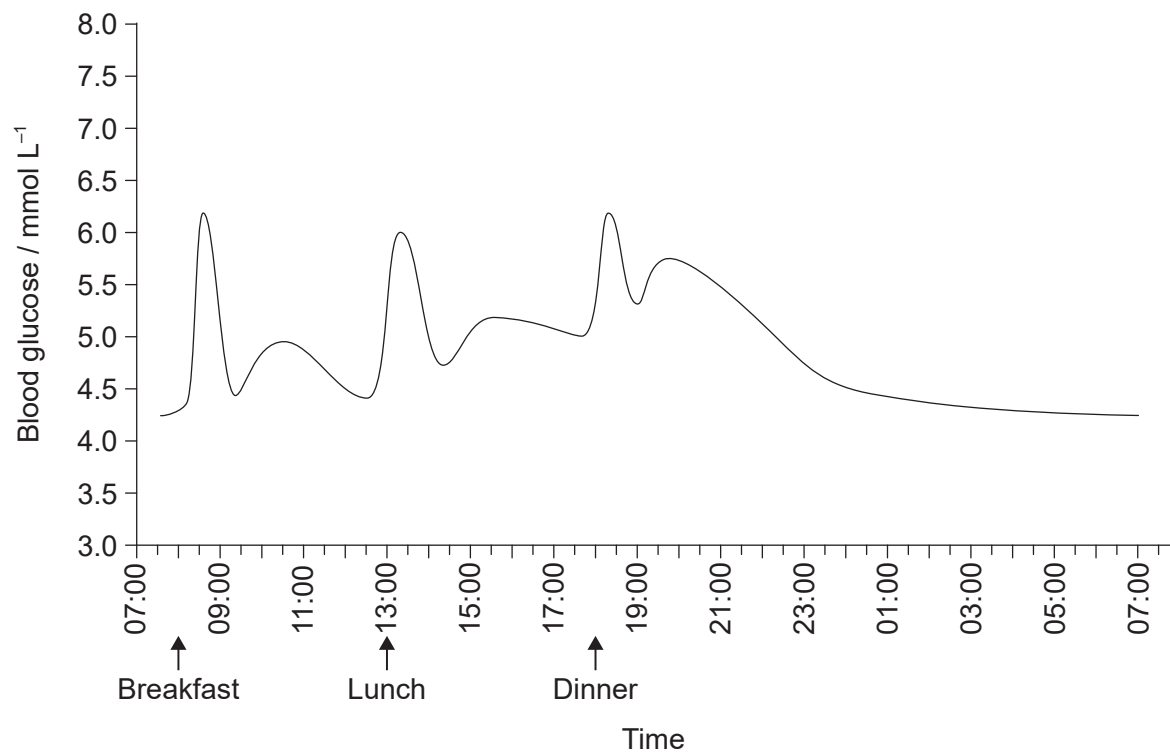
First assessment 2025

8 questions | questions

21. What is the body's response to an increase in environmental temperature?

- A. Uncoupled respiration in brown adipose tissue
- B. Vasodilation
- C. Vasoconstriction
- D. Shivering

21. The graph shows blood glucose levels over the course of a day.



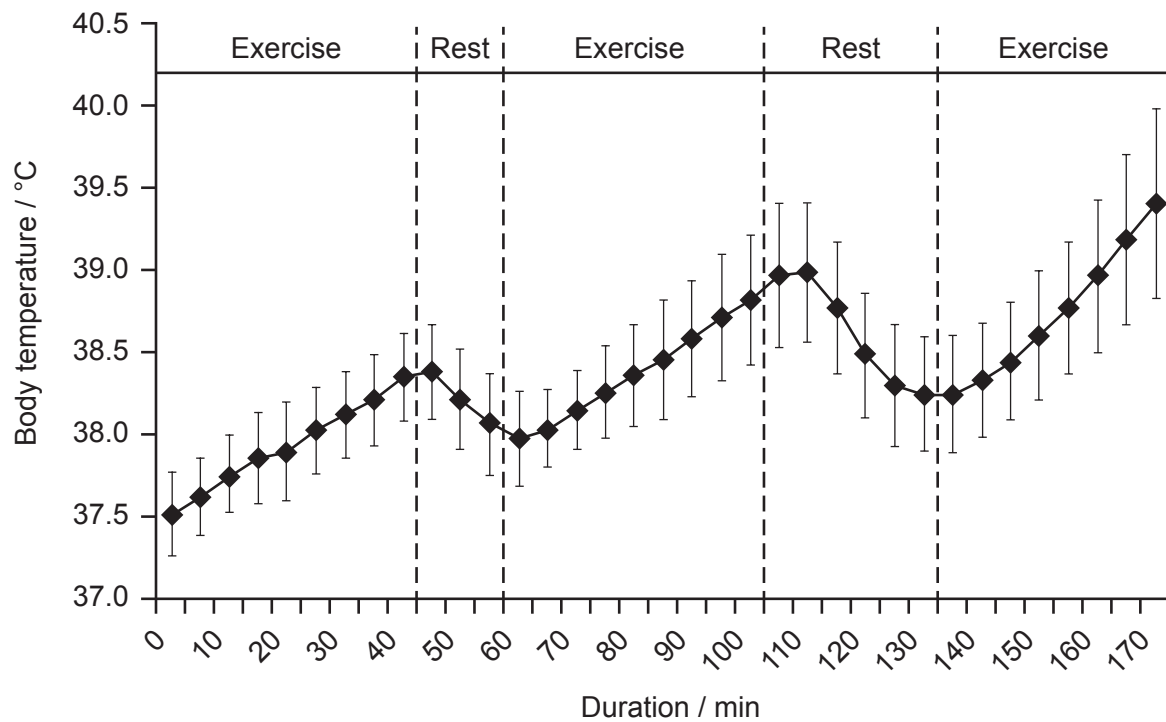
What could explain the trend in glucose levels between 20:00 and 23:00?

- A. Increasing insulin concentration forming glycogen from glucose
- B. Decreasing insulin concentration forming glucose from glycogen
- C. Increasing glucagon concentration forming glycogen from glucose
- D. Decreasing glucagon concentration forming glucose from glycogen

22. What occurs if human body temperature decreases?

- A. Thyroxin secretion decreases
- B. Vasodilation of skin arterioles
- C. Sweating increases
- D. Shivering increases

21. These results were obtained by measuring the body temperature of people exercising on a hot and humid day.

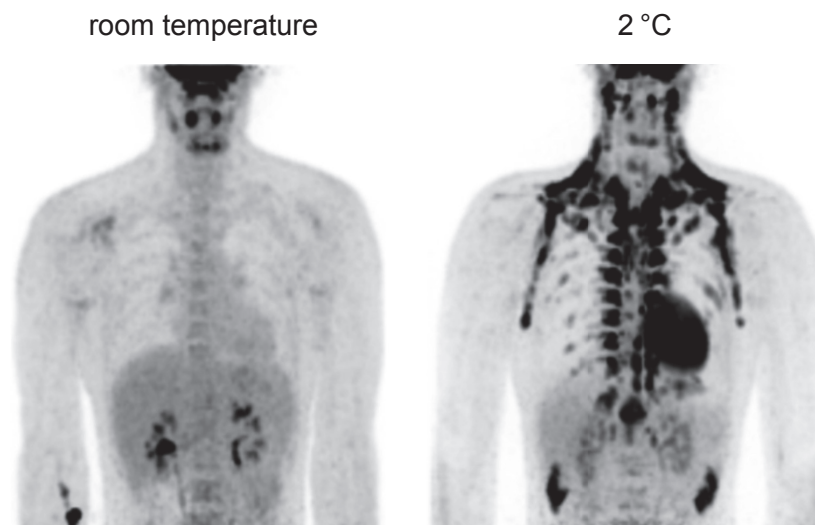


What mechanism could result in the changes seen during rest periods?

- A. Shivering
- B. Uncoupled respiration in brown adipose tissue
- C. Vasodilation in the skin
- D. Hair erection

Turn over

20. The dark areas in the PET/CT scanning images show the activity of brown adipose tissue in an adult human at room temperature (20 °C) and 2 °C.



How does brown adipose tissue contribute to regulating body temperature at 2 °C?

- A. It provides adenosine triphosphate (ATP) for muscle contraction when shivering.
- B. It further insulates the body so that internal heat is not lost.
- C. It turns into thick layers of white adipose tissue to prevent hypothermia.
- D. It breaks down fat to generate heat but not ATP.

Turn over

Section B

Answer **one** question. One additional mark is available for the construction of your answer. Answers must be written within the answer boxes provided.

6. Feedback control is used to regulate the levels of variables in the blood system.
- (a) Discuss the use of positive and negative feedback to control levels of variables. [4]
 - (b) Describe the mechanisms used to keep blood glucose levels within narrow limits in humans. [7]
 - (c) Explain the changes that would occur in the body if blood pH decreased below the optimum level. [4]

21. How would the body respond to a rise above normal body temperature?

	Type of feedback	Response
A.	positive	increased secretion from sweat glands
B.	positive	spread limbs to increase surface area
C.	negative	vasodilation of skin blood vessels
D.	negative	shivering

Section B

Answer **one** question. One additional mark is available for the construction of your answer. Answers must be written within the answer boxes provided.

8. Biological systems are sensitive to temperature changes, so they have mechanisms to resist temperature changes.
- (a) Explain the mechanisms involved in thermoregulation in humans. [7]
 - (b) Explain the relationship between temperature and the activity of enzymes. [4]
 - (c) Distinguish between the thermal properties of air and water as they relate to the habitat of animals. [4]



Turn over

[illegible]