

Exercise walk-through

Homeostasis ■ 14.4

eXercise

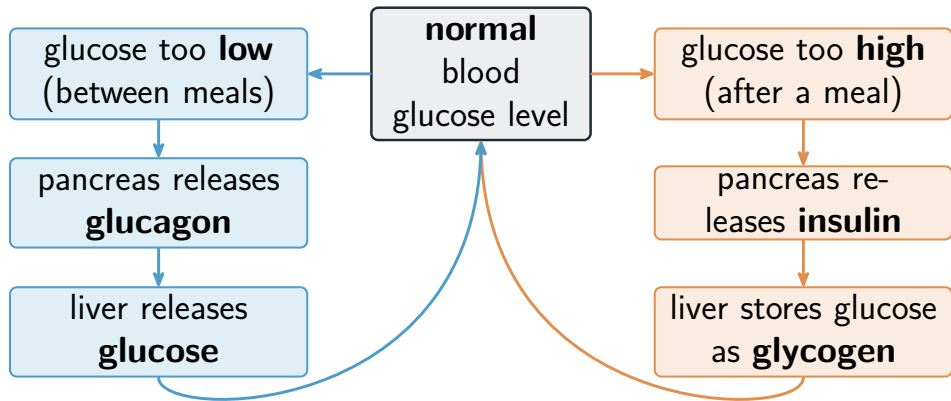
You must be able to

- define homeostasis and explain negative feedback
- describe how insulin and glucagon control blood glucose
- describe how the skin controls body temperature

Method — Blood glucose control

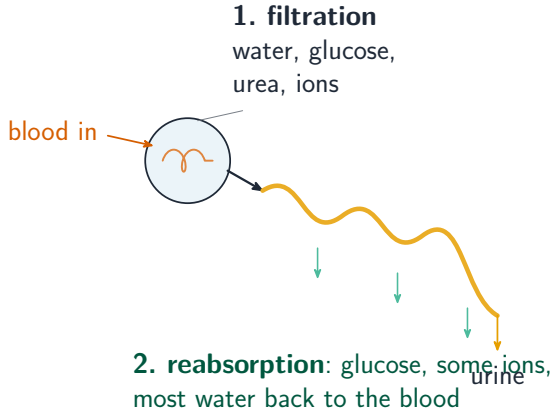
- **insulin:** after a meal, liver stores glucose as glycogen (lowers glucose).
- **glucagon:** between meals, liver releases glucose (raises glucose).
- **too hot:** sweating + vasodilation; **too cold:** shivering + vasoconstriction.

Method — Blood glucose control



Insulin lowers and glucagon raises blood glucose

Method — Blood glucose control



The kidney is a key homeostatic organ

Practice 2.1 ■ 1 mark

Define homeostasis.

Solution 2.1

Worked steps

keeping a constant internal environment inside the body **B1**.

Practice 2.2 ■ 1 mark

Name the hormone that lowers blood glucose.

Solution 2.2

Method: Blood glucose control

Worked steps

insulin **B1**.

Exam-style 3.1 ■ 1 mark

When you are too hot, the blood vessels near the skin surface:

A narrow (vasoconstriction)

B widen (vasodilation)

C disappear

D stop carrying blood

Solution 3.1

Method: Blood glucose control

A narrow (vasoconstriction)

B widen (vasodilation) 

C disappear

D stop carrying blood

Worked steps

B. When too hot, the vessels widen (vasodilation) to lose more heat.

Exam-style 3.2 ■ 3 marks

Blood glucose is kept steady by negative feedback.

- (a) Describe what happens after a meal raises blood glucose.
- (b) State what causes Type 1 diabetes.

Solution 3.2

Method: Blood glucose control

Worked steps

- (a) the pancreas releases insulin **M1**; the liver takes up glucose and stores it as glycogen **M1**; so blood glucose falls back to normal **A1**.
- (b) the pancreas cannot make insulin **B1**.

Exam-style 3.3 ■ 2 marks

Explain how sweating helps cool the body.

Solution 3.3

Worked steps

sweat evaporates from the skin **M1**; evaporation takes heat from the body, cooling it **A1**.