

SUMMARY HOMEOSTASIS

Homeostasis is the maintenance of a constant internal environment.

Insulin is secreted by the pancreas when blood glucose concentration is too high. It decreases blood glucose concentration.

In homeostasis, negative feedback helps to keep a value close to its set point.

Blood glucose concentration is controlled by a negative feedback loop involving the pancreas and liver.

When blood glucose concentration rises above its set point, insulin is secreted by the pancreas. This causes the liver to take up glucose from the blood, and to use some in respiration and also convert some to glycogen and store it.

When blood glucose concentration falls below its set point, glucagon is secreted by the pancreas. This causes the liver to break down some of its glycogen stores, and release glucose into the blood.

Temperature is controlled by a negative feedback loop involving receptors in the skin and hypothalamus in the brain, and effectors in the skin and muscles.

When body temperature rises above its set point, the hypothalamus sends electrical impulses along motor neurones to the skin.

This causes arterioles supplying the skin surface capillaries to dilate, in a process called vasodilation.

More blood flows close to the surface and more heat is lost to the air. Also, the sweat glands secrete more sweat, which evaporates from the skin surface, producing a cooling effect.

When body temperature falls below its set point, the hypothalamus sends electrical impulses along motor neurones to the skin.

This causes arterioles supplying the skin surface capillaries to get narrower, in a process called vasoconstriction.

Blood is diverted to capillaries deeper in the skin, so that less heat is lost to the air.

Fatty tissue underneath the skin helps to insulate the body, reducing heat loss to the air.