

# 5.3.7 Negative feedback

## AQA GCSE Biology (Higher) Question and answer notes

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### How to use these notes

These notes cover everything you need to know for this part of the specification. They have been written in question-answer format to make them easier for you to study from.

In order to study successfully, I recommend you do the following for each question and answer:

- Read it carefully and make sure you **understand** it.
- **Memorise** the answer.
- **Practice** applying your understanding to past exam questions.

A good way to memorise information is to use **retrieval practice**. This is when you practise retrieving information from your memory. You could do this by making a flashcard for each question with the question on one side and the answer on the other. Or you could use a flashcard app. Alternatively, use a sheet of paper to cover up the answer so you can only see the question. Try to answer the question and then check how you did.

You should practise retrieving each answer from your memory until you can do it perfectly. Even once you can retrieve the answer perfectly, your ability to retrieve it will probably fade as time passes without practising. Therefore you will need to keep going back to the questions that you have previously mastered and practising them again. However, each time you re-learn the answer, the memory will be stronger and will last longer than the time before.

### What is adrenaline?

Adrenaline is a hormone that is secreted by the adrenal glands during dangerous situations. It prepares the body and mind to deal with the danger (for example, by running away or fighting).

### What changes in the body does adrenaline stimulate?

Adrenaline stimulates the following changes in the body:

- Increased breathing rate
- The breakdown of glycogen stored in the liver and muscles into glucose
- Increased heart rate

**How does increased breathing rate help to prepare the body to deal with danger?**

Increased breathing rate leads to an increase in the rate at which oxygen is taken into the body. This means that there is more oxygen available for the process of aerobic respiration, which releases energy from food. Therefore, increased breathing rate allows the muscles and brain to have more energy to deal with the danger.

**How does the breakdown of glycogen to glucose help to prepare the body to deal with danger?**

The breakdown of glycogen to glucose leads to an increase in the amount of glucose available to the cells in the muscles and brain. These cells can break this glucose down through the process of respiration to release energy. This means that the muscles and brain have more energy to deal with the danger.

**How does increased heart rate help to prepare the body to deal with danger?**

Increased heart rate increases the rate at which blood circulates around the body. The blood supplies the body's cells with oxygen and glucose. Therefore, increasing the heart rate increases the rate at which the brain and muscles receive oxygen and glucose for aerobic respiration. Therefore, the brain and muscles have more energy to deal with the danger.

**What is basal metabolic rate?**

Basal metabolic rate is the rate at which an animal's body uses energy when at rest.

**What is thyroxine?**

Thyroxine is a hormone that is secreted by the thyroid gland. It stimulates the body to increase the basal metabolic rate.

**What is negative feedback?**

Negative feedback is when a system (such as the human body) responds to a change by taking actions that reverse the change. Negative feedback causes conditions to remain relatively constant.

**How is the level of thyroxine in the human body controlled?**

The level of thyroxine in the human body is controlled by a negative feedback process involving the pituitary gland. The pituitary gland secretes a hormone called TSH that stimulates the thyroid gland to secrete thyroxine. If the level of thyroxine in the body falls too low, the pituitary gland increases the amount of TSH it secretes, leading to an increase in the amount of thyroxine secreted by the thyroid gland. If the level of thyroxine falls too low, the pituitary gland decreases the amount of TSH it secretes, leading to a decrease in the amount of thyroxine secreted by the thyroid gland.