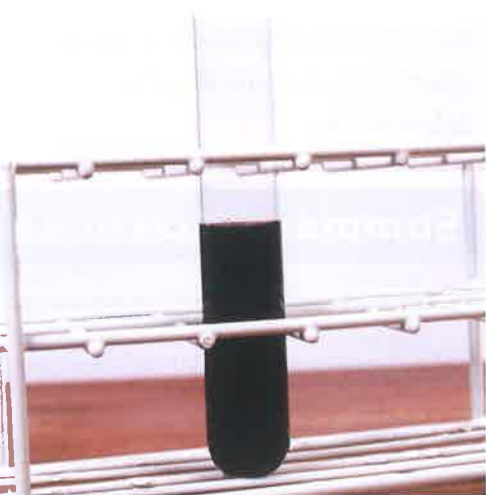


3.4.2 Food tests

Learning objectives

After this section you will be able to:

- describe how to test foods for starch, lipids, sugar, and protein
- describe the positive result for each food test.



▲ This food solution contains starch.

Key Words

food test, hypothesis

Hypothesis

Scientists observe the world and come up with a **hypothesis** to explain what they observe.

A hypothesis is an idea about things that always happen.

A hypothesis can be tested in an investigation. You can use hypotheses to make a prediction.

You may be able to guess by looking at some foods which nutrients they contain. For example, you may know that oily foods contain lipids. Scientists use food tests to find out which nutrients are in a food product.

How can you test foods?

A different chemical test exists for each type of nutrient. For most **food tests**, you will need a solution of the food. To prepare a food solution:

- 1 crush the food using a pestle and mortar
- 2 add a few drops of water, and mix well.

You should use a special type of water called distilled water – this is pure water that contains no other chemical substances.

How do you test for starch?

To test for starch you use iodine solution. Iodine solution is an orange-yellow liquid.

- 1 Add a few drops of iodine solution to the food solution.
- 2 If the solution turns a dark blue-black colour, the food contains starch.

A State the colour change in iodine if a food contains starch.

How do you test for lipids?

To test for lipids in a solid piece of food you use a piece of filter paper.

- 1 Rub some of the food onto a piece of filter paper.
- 2 Hold the paper up to the light. If the paper has gone translucent, the food contains lipids.

B State how you would test a solid piece of food for lipids.

To test for lipids in a food solution you use ethanol. Ethanol is a colourless liquid.

- 1 Add a few drops of ethanol to the food solution.
- 2 Shake the test tube and leave for one minute.
- 3 Pour the ethanol into a test tube of water.
- 4 If the solution turns cloudy, the food contains lipids.

How do you test for sugar?

To test for simple sugars such as glucose you use Benedict's solution. Benedict's solution is a blue liquid.

- 1 Add a few drops of Benedict's solution to the food solution.
- 2 Heat the test tube in a water bath.
- 3 If the solution turns orange-red, the food contains sugar.

C State the colour change in Benedict's solution if a food contains sugar.

How do you test for protein?

To test for protein you use copper sulfate solution and sodium hydroxide solution. Copper sulfate solution is a pale-blue liquid. Sodium hydroxide solution is a colourless liquid.

- 1 Add a few drops of copper sulfate solution to your food solution.
- 2 Add a few drops of sodium hydroxide solution.
- 3 If the solution turns purple, the food contains protein.

D State the colour change in a solution of copper sulfate and sodium hydroxide if a food contains protein.



◀ This food solution contains protein.



▲ This food solution contains lipids.



▲ This food solution contains sugar.

Summary Questions

- 1 Complete the table using the words below.

turns blue-black

turns orange-red

makes paper translucent

turns purple

Nutrient	Colour change if nutrient present
starch	
lipids	
sugar	
protein	

(4 marks)

- 2 Describe how to prepare a food solution of a breakfast cereal.

(3 marks)

- 3 Explain in detail how you would test a gingerbread-biscuit solution for the presence of starch, sugar, and protein.

(6 marks)