GCSE Biology required practical activity: Food tests

**Student sheet**

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| **Required practical activity** | **Apparatus and techniques** |
| Use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict’s test for sugars; iodine test for starch; Biuret reagent for protein. | AT 2, AT 8 |

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| **Learning outcomes** |
| **1 Use lab equipment and chemicals safely.**  **2 Use appropriate reagents to test for sugar, carbohydrate, lipid, and protein.**  **3 Record data in an appropriate results table.** |

**1. Testing for carbohydrates (starch)**

In this experiment you will test one or more foodstuffs for the presence of carbohydrates.

**Method**

**You are provided with the following:**

* food to be tested (bread, egg-white/albumen, sugar solution/glucose, oil)
* spotting tile
* iodine solution

1. Place a small sample of each food to be tested into wells on the spotting tile.
2. Add a drop of iodine solution to each food.
3. If the sample contains starch, the iodine will change to a blue/black colour.
4. Record your observations for each test on your results table.

**2. Testing for carbohydrates (sugar)**

Risk assessment

* Safety goggles should be worn when carrying out the tests.
* Wash off spills on skin immediately.
* Take care with boiling water.

**Method**

**You are provided with the following:**

* food to be tested (bread, sugar solution/glucose)
* a stirring rod
* 2 × test tube
* Benedict’s solution
* Water bath

**Read these instructions carefully before you start work.**

1. Add a small sample of the food to be tested into a separate test tube.
2. Add a small amount of water. Stir the mixture so that some of the food dissolves in the water.
3. Add 10 drops of Benedict’s solution to the solution in the test tube.
4. Put hot water from a kettle in a beaker OR use a hot water bath. The water should **not** be boiling. Put the test tube in the beaker for about five minutes.
5. Note any colour change.

If a reducing sugar (such as glucose) is present, the solution will turn green, yellow, or brick-red. The colour depends on the sugar concentration.

1. Record results in an appropriate results table.

**3. Testing for lipids**

In this experiment you will test one or more foodstuffs for the presence of lipids (fats).

Risk assessment:

* Safety goggles should be worn when carrying out the tests.
* Ethanol is highly flammable. Keep the solution away from naked flames.
* Wash off spills on skin immediately.

Method

**You are provided with the following:**

* food to be tested (oil)
* a stirring rod
* 4 × test tube
* ethanol
* safety goggles

**Read these instructions carefully before you start work.**

1. Place a small sample of food into a test tube. Then add a small amount of water.
2. Stir the mixture so that some of the food dissolves in the water. Do not filter.
3. Add 3 drops of ethanol to the solution in the test tube. Shake gently to mix.
4. If fat is present: a milky white oil layer will separate out and float on the water surface.
5. Record your results.

**4. Testing for proteins**

In this experiment you will test one or more foodstuffs for the presence of protein.

Risk assessment:

* Safety goggles should be worn when carrying out the tests.
* Biuret solution contains copper sulphate, which is poisonous, and sodium hydroxide, which is caustic.
* Wash off spills on skin immediately.

Method

**You are provided with the following:**

* food to be tested (egg-white/albumen)
* a stirring rod
* 4 × test tube
* a test tube
* Biuret solution

**Read these instructions carefully before you start work.**

1. Place a small sample of food into a test tube. Then add a small amount of water.
2. Stir the mixture so that some of the food dissolves in the water.
3. Add a small amount of Biuret solution to the solution in the test tube. Shake gently to mix.
4. Note any colour change. Record your results. Proteins will turn the solution pink or purple.