

Food test

By Doaa George, based on the workshop investigation by Fion Little

Introduction

Nutrients are chemicals found in the food you eat which supply your body with energy for growth and repair. Some nutrients are also used to build essential structures in your body. The main nutrients in food are called the macronutrients, which consist of carbohydrates (e.g. sugars and starch), proteins, lipids (fat). The minerals and vitamins in food are also essential for life.

We can test for the presence of these important compounds by using chemicals that react in predictable ways in the presence of them. We will be testing food samples to find what their nutritional composition is.

Safety

This experiment involves the use of glassware, make sure to be cautious while holding them and report any glass breakage to your teacher.

Always wear your safety goggles.

Follow the safety rules while using the Bunsen burner and the matches.

Wear gloves while handling the chemicals.

Make sure you are not allergic to any of the food samples used.

Questions

Think about what questions you could ask with this investigation. What variables can you change?

Conduct an experiment which will show which macronutrients are present in the food items you have chosen. Can you then make a statement about how these food items fit into a balanced diet?

Aim

You are going to test food for the presence of glucose, starch, protein and lipids.

Hypothesis

Glucose (Simple Carbohydrate) will be found in _____.

Starch (Complex Carbohydrate) will be found in _____.

Lipids (Fat) will be found in _____.

Proteins will be found in _____.

Plan

This experiment has been planned for you. However, you are given the choice to select which types of food that you would like to test. A good idea is to select food from your lunch box to find out what is in the foods you regularly eat.

Materials

- 10 ml measuring cylinder
- Matches
- Bunsen Burner
- Test tubes
- Benedict's solution
- Iodine solution
- Biuret solution (dilute NaOH and copper sulfate)
- Brown paper
- Food samples
- White tile
- Mortar and pestle

Conduct

Method

1. Test each of the controls (using the techniques outlined in steps 4 to 6) so that it is known what a positive result should look like. Tabulate the results.
The control is a solution of known composition, in this experiment the controls are: glucose solution, starch solution, egg white (for protein) and vegetable oil (for lipid).
2. Crush a small amount of each food sample using a mortar and pestle and add it to individual test tubes.
3. Dilute each sample using 10 ml of water.
4. Gently shake each test tube for 30 seconds.
5. Test each food sample for glucose, starch and protein using the procedures tabulated below:

Substance being tested for	Procedure
Glucose	Add five (5) drops of Benedict's Solution to each test tube. Shake tubes for 30 seconds then heat over a Bunsen flame.
Starch	Add five (5) drops of Iodine Solution to each test tube. Shake the tubes for 30 seconds.
Protein	Add five (5) drops dilute NaOH to each test tube. Shake each tube gently for 30 seconds then add three (3) drops copper

	sulfate to each tube. Shake each tube gently for 30 seconds.
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- Compare each test tube to the control and record the observations

Test for lipids

- Place a small amount of each food sample on a white tile.
- Press a small piece of unused brown paper onto each sample, remove and place back on the white tile and leave it to dry for 5 minutes.

Make sure roles are distributed among the group members. Record all your observations and tabulate your findings.

Record your observations

Table 1: Observations of positive test results from the control substances

Control	Observations
Glucose (glucose solution)	
Starch (starch solution)	
Protein (egg white)	
Lipid (vegetable oil)	

Table 2: Observations from testing Foods

Food	Observations

Analysis:

Examine your observations and find out if the colour change is similar to the control.

Summarize your findings.

Table 3: Results of testing tissues

Tissue/material	Substance present/absent			
	Glucose	Starch	Protein	Lipids

Were there any observations that were unclear? Were there any food items for which you are still unsure as to their composition?

Problem Solves

Discussion

Relate the presence of substances to the function of tissue(s) they were found in.

Compare your results to those of other groups – were your results reliable?

Was your experiment valid?

How could you improve the reliability and validity of the experiment?

Conclusion

State whether your aim was met, summarize your findings then state whether the hypothesis was supported or not.

Refer to the Australian Guide to Healthy Eating; what can you conclude about the 5 food groups and what is meant by the term: a balanced meal?