Fat containing nutrients (Item No.: P8012500)

Curricular Relevance

Area of Expertise: Biology
Education Level: Age 14-16
Topic: Nutrition and digestion
Subtopic: Nutrients
Experiment: Fat containing nutrients

Difficulty	Preparation Time	Execution Time	Recommended Group Size
Intermediate	10 Minutes	10 Minutes	2 Students

Additional Requirements:

- Writing paper
- Razor blades
- Butter
- Boiled egg white
- Shelled walnut or hazel nuts
- Sausage

Experiment Variations:

Keywords:

Grease stain test, Sudan-III-solution

Task and equipment

Information for teachers

Additional Information

Fats, together with starch and sugar, the carbohydrates, supply the energy necessary to maintain all the vital processes. They do this through the mechanism of respiration (=combustion) in the metabolism of our bodies. Moreover, number of fatty acids which are constituents of the fats themselves are essential fort eh preservation of bodily health. Finally, inasmuch as they are stored up in certain parts of the body they provide a protection against cold.


Hazards!

- Sudan III solution contains ethanol. Ethanol is highly inflammable. Extinguish all open flames!
- Close and remove all bottles when they have been used.

Disposal

Pour the contents of the test tubes of Experiment 2 into the container for halogen-free organic solvents.

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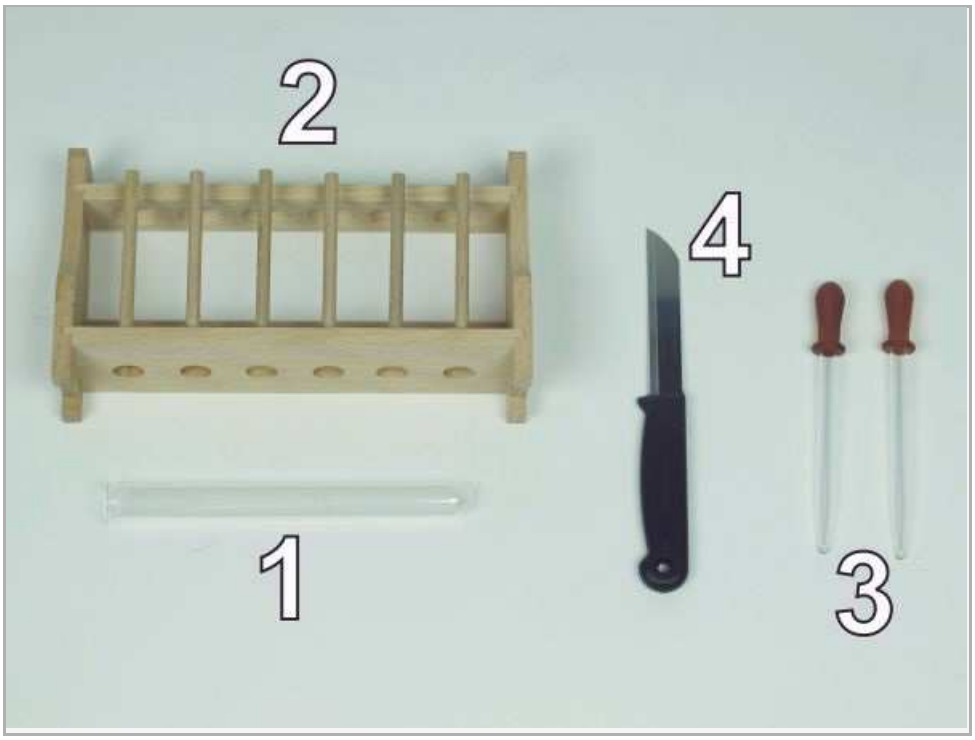
Task and equipment

Task

Which foods contain fat?

Learn possible tests for fat and examine various foodstuffs for fat.

Equipment



Position No.	Material	Order No.	Quantity
1	Test tube 160x16 mm, 10 pcs	37656-03	(1)
2	Test tube rack f. 6 tubes, wood	37685-10	1
3	Pipette with rubber bulb	64701-00	2
4	Knife, stainless	33476-00	1
	Protecting glasses, clear glass	39316-00	1
	Olive oil,pure 100 ml	30177-10	1
	Sudan-III solution,alcohol 250 ml	31861-25	1
Additional material			
	Writing paper		
	Razor blades		
	Butter		
	Boiled egg white		
	Shelled walnuts or hazel nuts		
	Sausage		

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Set-up and procedure


Hazards!

- Sudan III solution contains ethanol. Ethanol is highly inflammable. Extinguish all open flames!
- Close and remove all bottles when they have been used.

Experiment 1

Mark two pencil crosses on a sheet of writing paper, about 10 cm apart.

By means of a pipette place a drop of olive oil (fat) on to one of the crosses and with another pipette place a drop of water onto the other cross. (Fig. 1). Place the sheet of writing paper on a warm place, e.g. in the sun or on the top of a warm radiator.

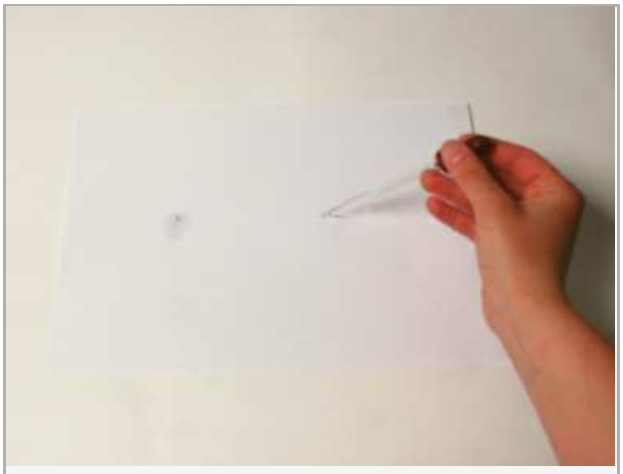

Fig. 1

Wait for some hours and observe the sheet of writing paper. Note your observations in the report.

Experiment 2

Half fill a test tube with water, add 10 drops Sudan III solution, close the test tube with your thumb and shake several times (Fig. 2).

Fig. 2

Into the faintly pink-coloured mixture place 20 drops of olive oil. Close the test tube again with your thumb, carefully turn the tube upside down a few times and put it in a test tube rack. In a few minutes the oil settles at the top of the tube.

Note your observations in the report.

Experiment 3

Cut a walnut or hazel nut with a knife. Press the cut surface of the nut and in addition some sausage, butter or boiled egg white onto a sheet of writing paper (Fig. 3).

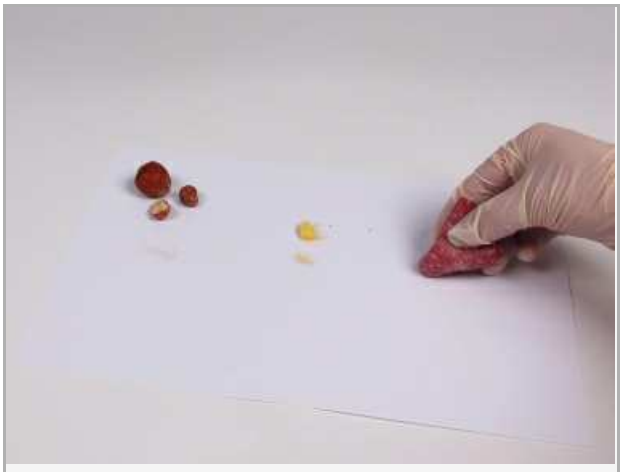

Fig. 3

Wait some time until the sheet of writing paper has dried and observe it closely. Note your observations in the report.

Disposal

Pour the contents of the test tubes of Experiment 2 into the container for halogen-free organic solvents.

Report: Fat containing nutrients

Result – Observations 1

Write down your observations on Experiment 1. What differences can you see? How can you tell the mark on which the oil was dropped?

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Result – Observations 2

Write down your observations on Experiment 2. What is the colour of the oil, what is the colour of the water?

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Result – Observations 3

Write down your observations on Experiment 3. Which foodstuffs leave permanent stains on the sheet of writing paper?

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Evaluation – Question 1

How can fat be detected? Consider your results from experiment 1 to answer this question.

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Evaluation – Question 2

Apart from the method adopted in the first experiment how can oil (fat) be detected? Consider your results from Experiment 2.

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Evaluation – Question 3

Which foodstuffs contain fat?

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