

What is a 'healthy' fat?

Fat is an essential part of our diet. We need fat to help make hormones and to keep us warm, among other things. Foods containing a lot of fat are often very tasty, cheap and easy to buy. We end up eating more fat than we need. This experiment will show you which fat molecules are healthier than others. The results will help you make good choices about foods containing fat.

Did you know about fat?

The molecules that we call *fat* have an E-shaped structure.

The back of the 'E' is a three-carbon atom chain.

The 'prongs' of the 'E' are long carbon chains. There is an ester linkage between each prong and the back of the E.

The long carbon chains can have one, two or many $>C=C<$ double bonds. Fats with double bonds are described as *unsaturated*.

Fats with no $>C=C<$ double bonds are described as *saturated*.

Unsaturated fats are healthier than saturated ones. This is because the body can use unsaturated fat molecules much more easily.

Fats can be either solid or liquid at room temperature.

We normally call solid fats *fats* and liquid fats *oils*.

Experiment: Investigating fats and oils

Equipment

- About 5 cm³ of each fat (melted) or oil
- Measuring cylinder or pipette to measure the fat or oil
- Test-tubes, one for each fat or oil
- Iodine 2% (**Harmful**) in potassium iodide solution
- White card for background
- Stopwatch
- 250 cm³ beaker
- Hot water (at around 70-80 °C)
- Test-tube rack
- Eye protection.

What you do

- Place 5 cm³ of fat or oil in a test-tube.
- Add exactly three drops of iodine solution.
- Place the test-tube in a beaker of hot water.
- Start the stopwatch.
- Stop the watch when the red colour disappears. Record the time elapsed.
- Repeat with each of the other fats and oils, using a clean test-tube each time.

Questions

1. Which fats took the longest and the shortest times to decolourise the iodine?
2. Which fat is the most saturated and which is the least saturated?
3. Which fat is the most 'healthy' of those you tested?
4. Discuss how this information could be used to improve people's eating habits.
5. What other tests could you carry out to decide if a fat is 'healthy' or not?