

1 Biochemische Aspekte des Lebens

1.1 Lipide

CLIL – Oil and fatty acids

Experiment: The properties of oil used in the kitchen

When we go to the supermarket we find a variety of different oils, butter, and margarines. But which fat is suitable for what? Investigate the properties of these fats.

You need: Olive oil, sunflower oil, corn oil, rapeseed oil, pumpkin seed oil, soybean oil, peanut oil, butter, animal lard, clarified butter and margarine

1. Put each fat in a test tube. For solid fats (e.g. butter) carefully melt the fat until it becomes liquid. Wait until the solid fats are solid again. Now look at the fats. Describe the color of these fats.
2. Put the samples in the freezer. Later remove the samples and determine their melting points.
3. Now determine the smoke point as well. If there is no suitable heating facility, look for the values on the internet.

	Color	Melting point	Smoke point
Olive oil			
Sunflower oil			
Corn oil			
Rapeseed oil			
Pumpkin seed oil			
Soybean oil			
Peanut oil			
Butter			
Animal lard			
Clarified butter			
Margarine			

Now heat an oil six times in a row and measure the smoke point each time it is heated.

What can you observe?

Why is this so?

The smoke point of a fat depends mainly on the proportion of free fatty acids. The higher this proportion, the lower the smoke point. A fat or oil that has already been heated several times (e.g. when deep-frying) has a higher content of free fatty acids than a "fresh" one.

Quiz

Try to find the correct answer!

Originally native to?....., the cultivation of peanuts has spread throughout the tropics and subtropics since their growing importance as an oil crop.

- ? =
- A) North Africa
 - B) South America
 - C) North America
 - D) India

The soybean was introduced at the 1873 World's Fair in?.... to the western world.

- ? =
- A) Vienna
 - B) Madrid
 - C) Paris
 - D) New York

A typical specialty from Eastern Styria is

- ? =
- A) Safflower oil
 - B) Poppy seed oil
 - C) Pumpkin seed oil
 - D) Corn oil

Olive oil consists of 50 to 80%

- ? =
- A) oleic acid
 - B) palmitic acid
 - C) omega 3 fatty acid
 - D) linoleic acid

How much milk do you need to make 1kg butter?

- ? =
- A) 4 - 8 liter
 - B) 10 - 14 liter
 - C) 16 - 20 liter
 - D) 22 - 25 liter

Palm oil plantations are destroying living space of

- ? =
- A) Gorillas
 - B) Ocelots
 - C) Giraffes
 - D) Orangutans

The more liquid a fat is, the higher is its content of

- ? =
- A) unsaturated fatty acids
 - B) saturated fatty acids
 - C) trans fatty acids
 - D) cis fatty acids

Which edible oil is most used in the world?

- ? =
- A) Palm oil
 - B) Soybean oil
 - C) Rapeseed oil
 - D) sunflower oil

Which fat is used to fry the original Wiener Schnitzel?

- ? =
- A) Corn oil
 - B) Palm oil
 - C) Rapeseed oil
 - D) Clarified butter

Which animal product contains a lot of omega-3 fatty acids?

- ? =
- A) Veal
 - B) Chicken
 - C) Fish
 - D) Deer meat

How much energy does one gram of fat mean?

- ? =
- A) 37,7 kJ (9 kcal)
 - B) 29,3 kJ (7 kcal)
 - C) 20,9 kJ (5 kcal)
 - D) 16,7 kJ (4 kcal)

Solution of the quiz

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