

Plant oils and their uses

1. High amounts of cholesterol in the blood can cause heart disease.
- Eating saturated fat increases the amount of cholesterol in blood.
 - Eating monounsaturated fat does not increase the amount of cholesterol in blood.
 - Eating polyunsaturated fat decreases the amount of cholesterol in blood.
- (a) The amounts of saturated fat and polyunsaturated fat in different types of margarine are shown in the table.

Type of margarine	Description	Saturated fat, g per 100 g margarine	Polyunsaturated fat, g per 100 g margarine
W	Hard margarine from animal and vegetable oils	30	14
X	Soft margarine from animal and vegetable oils	27	16
Y	Hard margarine from vegetable oils only	30	10
Z	Soft margarine from vegetable oils only	26	18

Which type of margarine, **W**, **X**, **Y** or **Z**, would you consider best to use to lower blood cholesterol?

Explain your answer.

The best type of margarine to use is

Explanation

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(2)

- (b) Use the correct words from the box to complete the sentences.

higher	hydrogen	lower
oxygen	saturated	unsaturated

- (i) Animal and vegetable oils that contain fats can be hardened.

(1)

- (ii) When oils are hardened with gas, a chemical change takes place, producing margarine which has a melting point than the original oil.

(2)

(Total 5 marks)

2. The label on a bottle of salad dressing shows that the dressing contains the following ingredients.

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|---|
| <p>Ingredients
 Water
 Vegetable oil
 Egg yolk
 Sugar
 Flour
 Vinegar
 Salt
 Extract of spices
 Preservative E202
 Emulsifier E405</p> |
|---|

- (a) One of the main ingredients in salad dressing is vegetable oil.
- (i) Use the correct word from the box to complete the sentence about the extraction of vegetable oil.

crushed	evaporated	hardened
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To extract the vegetable oil, the fruits or seeds of plants are first

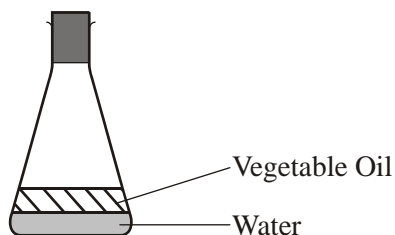
..... (1)

- (ii) The liquids can be separated from the solid parts of the fruits or seeds by filtering. Suggest **one** reason why separation by filtering is better than separation by distilling.

..... (1)

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- (b) (i) A mixture of vegetable oil and water is shaken and left to stand for several minutes. The diagram shows the result.

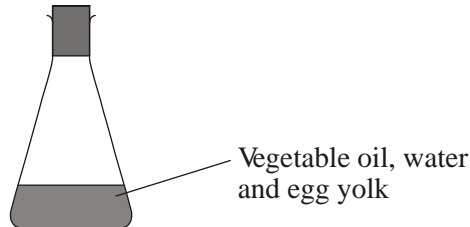


Complete the following sentence.

The vegetable oil and water (1)

- (ii) A mixture of vegetable oil, water and egg yolk is shaken and left to stand for several minutes.

The diagram shows the result.



Use words from the box to complete the sentence.

additive	distil	emulsion	extract	mix	separate
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The egg yolk causes vegetable oil and water to
and form an

(2)
(Total 5 marks)

3.

Look after your heart

A diet high in polyunsaturated fat decreases the probability of developing coronary heart disease.
A diet high in saturated fat increases the probability of developing coronary heart disease.

- (a) Use the information from the table below to answer each question.

Type of oil	Polyunsaturated fat in grams per 100 g of oil	Saturated fat in grams per 100g of oil
Maize	49	16
Olive	11	14
Palm	8	45
Soya Bean	57	14

- (i) Which type of oil appears to be best for your heart? Explain your answer.

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(2)

- (ii) Cultures that use only olive oil in food preparation have less heart disease than cultures that use other types of oil.

Suggest a possible reason for this.

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(1)

- (b) A company compared the relative 'unsaturation' of five oils. Bromine water was added from a burette to equal amounts of each oil until the bromine water remained orange-yellow.

The volume added was recorded.

Type of oil	Volume of bromine water added in cm ³
Maize	25.6
Olive	6.1
Palm	4.9
Soya Bean	29.9
Sunflower	25.1

- (i) What would you see when the first few drops of bromine water are added to each oil?

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(1)

- (ii) What do these results tell you about sunflower oil compared with the other oils?

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(2)

(Total 6 marks)

4. Margarine is manufactured using 'hard' plant oils. A margarine company tested several plant oils to determine their hardness for use in its margarine.

In the test iodine solution was used to find the iodine value. The units are grams of iodine that react with 100 g of oil.

Plant oils with lower iodine values are harder and are less unsaturated.

Plant oil	Melting point in °C	Iodine value
Coconut	25	10
Palm	35	54
Olive	-6	81
Castor	-18	85
Peanut	3	93
Rapeseed	-10	98
Sunflower	-17	125
Soya bean	-16	130

- (a) Do the results in the table indicate that there is a relationship between the melting point of a plant oil and its hardness?

Explain your answer.

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(2)

- (b) The company stated that some of the plant oils were brown and that this may have affected the results.

Explain why the company considered the colour of plant oils to be a problem with this test.

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(2)

- (c) A consumer group stated that the test should not be carried out by the margarine company but by independent scientists.

Explain why.

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(2)

- (d) The company intends to use sunflower oil to make its margarine.

Explain how the company could process the sunflower oil to make it suitable for the manufacture of margarine.

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(3)

(Total 9 marks)