

TRANS FATTY ACID (TFA)

I. With the aid of the chart below calculate the mass (in gram) of trans fatty acid in 100 g of fat!

| | Product | mass of one portion | TFA: mg/portion | Fat content g/100 g | TFA: mg/100 g product |
|----|------------------------|---------------------|-----------------|---------------------|-----------------------|
| 1. | Chanterelle cream soup | 63 | 5 | 3,5 | 8 |
| 2. | doughnut jam | 52 | 48 | 13,7 | 92 |
| 3. | Fruit cake | 122 | 197 | 7,9 | 161 |
| 4. | Croissant + chocolate | 58 | 689 | 16,1. | 1195 |



II. Write „T” if the statement is true for trans fatty acid, and „F” if it is false!

- Trans fatty acids raise the level of the harmful LDL-cholesterol (bad cholesterol) and lower the level of the protective HDL good cholesterol in blood.
- Trans fatty acids are artificially produced substances, they are not natural materials.
- Trans fats can be easily decomposed by enzymes of human beings so they provide benefit to human health.
- Trans fatty acids are unsaturated compounds containing only one double bond. Hydrogen atoms bound to the carbon atoms appear on opposite (trans) position of the double bond.
- Trans fats consist of only saturated fatty acids in which only simple bonds can exist between carbon atoms.
- Trans fats are products of partial hydrogenation of plant oils or refinement of oils.
- The milk and body-fat of some ruminants (cow and goat) also contain trans fats. The trans-fat content of butter is about 2-4%.
- Trans fats increase the “melting points” of fats so it is easy to prepare greasy solid or semi-solid fats from liquid oils at room temperature.
- The risks of coronary heart diseases can be increased up to 20 % by trans fats.
- Trans fats lower the level of some inflammation proteins in blood so they prevent blood clotting.
- Hydrogenation of oils slows down the rancidity.
- Trans fats stabilise the membranes of heart muscle-cells.
- Enhance the resistance to insulin, so they can directly contribute to the development of diabetes.
- Trans fats might decrease the conception in women up to 70 %.
- According to the international and national nutritional recommendation the maximum level of trans fat consumption should be limited to less than 1 % of overall energy intake. It means that the average, adult woman is allowed to consume 2 g of trans fat a day.
- Coconut fat is a solid plant fat at room temperature in temperate zone.
- Fats and oils are esters of glycerol which hydrolyse to glycerol and long chain fatty acids during the digestion process.
- The content of trans fats of frozen baker’s wares, pizza and chips is very high
- Buttered popcorns in cinemas do not contain trans fats so they are very healthy crunches.
- Triglycerides, liquid at room temperature, are called oils.

SOLUTION:

I.

| | | | |
|-----|-----|-----|-----|
| 1. | 2. | 3. | 4. |
| 0,2 | 0,7 | 2,0 | 7,4 |

Detailed solution of I/3 (Fruit cake):

| | | |
|----|---|--|
| 3. | The fat content of 100 g of fruit cake is | 7.9 g |
| | in a slice of fruit cake: in 122g | $x=9.638$ g fat in a slice of fruit cake |
| | in 100 g of product | 161 mg trans fat |
| | in 122 g cake | 197 mg |
| | in 9.638 g fat | 0.197 g trans fat |
| | in 100 g fat | $x= 2$ g trans fat in 100 g fat |

(Remember, in case of women the daily recommended amount (DRA) of trans fats is 2 g!

II.

| | | | | | | | | | | | | | | | | | | | |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. | 17. | 18. | 19. | 20. |
| I | H | H | I | H | I | I | I | I | H | I | H | I | I | I | I | I | I | H | I |