Introduction/Aim

Cookies are widely consumed especially by young people. Nowadays there is a wide range of this type of products, and every day new options are available in the market. These foods are generally recognized as a source of unhealthy nutrients, such as salt and fat, namely saturated and trans fatty acids. The excessive intake of those nutrients is linked with an enhanced risk for the development of several chronic diseases. The aim of this work was to determine salt, total fat and fatty acids composition of “Maria” cookies and cream crackers, as well as to estimate the benefit/risk associated with their consumption.

Sample collection and homogenization

- 15 samples of cookies
- Samples were collected randomly in major supermarkets chains from the Portuguese market
- Samples were kept in appropriate containers, maintained in the dark, and refrigerated until analysis
- 5000 rpm for 1 min

Salt [1]

- 5 g of sample
- + 2.5 mL of tric acid acetate
- + 2.5 mL of potassium ferrocyanide
- Filtered (Whatman n°1)
- + 1 mL of nitric acid
- + 10 mL of silver nitrate
- Titrate with potassium thiocyanate until orange colour

Total fat [2]

- 2 – 4 g of sample
- 75 mL Ultra-pure water
- + 45 mL of HCl
- Boiled for 20 min
- Filtered (Whatman n°1)
- 30 mL petroleum ether
- Extracted using a Soxhlet with 75 mL petroleum ether
- Residue was dried for 1 h, 30 min at 100 °C ± 2 °C, until constant weight

Individual fatty acids [3]

- A higher variability (0.89 to 1.4 g/100 g) between the monounsaturated fatty acids content was observed in “Maria” cookies.
- Trans fatty acids ranged from 20.1 to 83.4 g/100 g (cream crackers brand H) and from 24.4 g/100 g (“Maria” cookies brand C).

Extracton/ Transesterification

- 10 g of sample
- 120 mL petroleum ether
- Miced for 1 h and filtered
- 0.2 g of fat
- + 2.5 mL n/Nahepton
- + 0.25 mL KOH (2 M)
- Rest for 30 min
- Filter and inject

Gas chromatography

- Equipment: HP 6890 N
- Column: SP-2380 (100 m x 0.25 mm I.D., 0.20 µm)
- Detector: Flame Ionization
- Carrier gas: Helium
- Split: 30:1
- Injection volume: 1 µL
- Oven range: 50°C (held 2 min) Increase 17°C/min to 168°C (held 28 min); Increase 4°C/min to 230°C (held 15 min)

Concerning salt content (Figure 1A), cream crackers have the highest value (1.82 g/100 g, brand H).

For cream crackers, the total fat content (Figure 1B) varied between 10.3 and 23.0 g/100 g, while for “Maria” cookies it ranged from 8.73 to 19.5 g/100 g.

The saturated fatty acids were the highest in 6 cream cracker brands and in 4 “Maria” cookies brand (Figure 1C).

A higher variability (0.89 to 1.4 g/100 g) between the monounsaturated fatty acids content was observed in “Maria” cookies.

Potato, cereal and cereals products

According to the Mediterranean diet food wheel (Figure 2), an intake of 4 to 11 daily portions is recommended for this food group

- Children (1 to 3 years)
  - 4 portions per day
- General population
  - 7.5 portions per day
- Teenage boys and active men
  - 11 portions per day

35 g of “Maria” cookies brand C can contribute with 12% of the reference intake for fat

References


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Figure 1: 1A. Total fat (B) and fatty acids (C) contents (g/100 g) of the analysed cookies. SFA – saturated fatty acids; MUFA – monounsaturated fatty acids; PUFA – polyunsaturated fatty acids.

Figure 2: Mediterranean diet food wheel. Source: https://www.euro-mediterranean.net/en/food-and-health/ and http://www.alimentacaosaudavel.dgs.pt/rod

Conclusions

The analysed cream crackers present higher levels of total fat and salt, and goals must be established to allow the gradual reformulation of these foods. Moreover, the analysed cookies, in general, continue to present high levels of saturated fat. However, in this work it was observed that some cookies present higher amounts of unsaturated fatty acids, which can contribute to the prevention of chronic diseases and reduce the health impact related to the consumption of this type of food.