Fat content as a way to preserve pastry in vending machines?

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Introduction

Vending machines are increasingly present in our daily lives, but their snack offer is usually regarded with particular attention by health authorities due to their potential implication in excessive consumption of salt, free sugar, fats, and overall calories. In order to grant increased shelf life of vending machine products, several food processing strategies might be used, including recipe alterations, packaging, modified atmosphere, refrigeration, etc.

The presence of fat in foods is important for their energetic value, greatly contributes to its organoleptic characteristics, in addition to serving as a vehicle for essential compounds such as fat-soluble vitamins and fatty acids. Therefore, both the quantity and the fat quality are important: the balance and amounts of saturated fat (SFA) and unsaturated fat (MUFA and PUFA) should be accounted for, since the intake of excess saturated fat and trans fat is associated with an increased risk of diseases, namely cardiovascular disease, obesity or diabetes. Trans fat are presently under regulation, with a limit of 2g per 100g of lipids foodstuffs in Portugal. (2)

Aim

➢ Perform comparative nutritional analysis of cakes from vending machines and their counterparts from traditional pastry shops;
➢ Evaluate the potential use of fats (quantity) as a preservation mode and with potential repercussions for health (quality).

Methodology

In this study, we analyzed eighteen samples of cakes: one homemade, seven from pastry and ten from vending machines. This analysis includes the study of moisture content, total fats and saturated, unsaturated and trans fatty acids in cakes. The cake samples were divided into two major groups: simple cakes and puff cakes.

The studied parameters under analysis were determined by standard analysis procedures and the fatty acid composition by gas-chromatography.

Results

Figure 1. Comparative average for cake mass, calories per 100g and calories per cake unit between vending and pastry. Calories per unit varied from 305 kcal (vending marble cake) to 1058 kcal (puff cake “napoleão” from a pastry), with 240 kcal as a control from a homemade chocolate cake slice.

Figure 2. Comparative analysis between vending and pastry cakes, per 100g.

Figure 3. Comparative analysis between vending and pastry cakes, per cake unit.

Figure 4. Comparative analysis between simple and puff cakes, per cake unit.

Figure 5. Fatty acids profile of all eighteen cakes analysed. The amount of PUFA in simple cakes (1-10) stands out but puff cakes (11-18) show a large amount of SFA. Cakes number 11, 12 and 14 have a higher value of trans fatty acids.

Conclusion

• The extended shelf life of vending machine cakes cannot be attributed to their fat content but rather to other strategies as refrigeration and packaging
• We emphasize that the size of the cakes unit is fundamental for any conclusions drawn from this study since there are very different unit sizes between vending cakes and pastry cakes. The greater mass inflated nutritional values, with calories per unit as high as 1058. We suggest an adaptation of the size/calories of the cakes to a defined limit.
• Although labeling in vending products is advantageous, it should be carefully reviewed because: in this work, we verified inconsistencies between the labeled value and the experimental values. Also, one pastry uses fats outside the regulated trans-fat limits.

References

1. Impact of Nonpolar Traces of Saturated, Polyunsaturated, and Trans Fat on Global Burden of Coronary Heart Disease. J Am Heart Assoc Cardiovasc Cardiovasc Dis [Internet]. November 8th, 2017 [cited April 21st, 2021] [Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5219320/]