

MONITORING OF TRANS FATTY ACIDS CONTENT IN LABELING OF ULTRA-PROCESSED FOODS MARKETED IN BRAZIL

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Introduction

Industrial *Trans* Fatty Acids (iTFA) are present in ultra-processed foods due to the indiscriminate use of Partially Hydrogenated Fat (PHF) to guarantee their attractive sensorial attributes [1]. However, the consumption of iTFA is associated with adverse health effects and should be removed from the global food supply, especially by eliminating PHF from ultra-processed foods [2,3,4]. Currently, Brazilian regulation (RDC n° 332/2019) restricted the presence of iTFA up to 2 g per 100 g of total fat in food products, which elimination will be mandatory from January 2023 [5]. In this sense, monitoring iTFA contents through Brazilian food labeling is an effort to control the compliance of the food industry with RDC n° 332/2019. Therefore, the present study aimed to monitor the presence of partially hydrogenated fat and the content of industrial *trans* fatty acids in ultra-processed foods marketed in Brazil.

Material and methods

Photographies of all sides of ultra-processed food labels (n=1025) were collected between February and July 2021 from products sold in supermarket chains and small retail stores in Rio de Janeiro (Brazil). Food products selected were manufactured by national or regional producers. To ensure the capture of food labels available regionally in other Brazilian states, the *Desrotulando* applicative (2.2.0 version, FoodRead Inc.) was used. The food labels were obtained from frozen foods, bakery products, chocolates and candies, ice creams, food mixes, sauces and creams, and snacks. Information about the content of iTFA and the presence of PHF or relative terms was collected from the nutrition facts panel and the list of ingredients, respectively. The relative terms were “vegetable fat”, “margarine” or “hydrogenated vegetable oils”. All data were evaluated by descriptive statistical analysis (absolute and relative frequency, mean and standard deviation). Hierarchical and non-hierarchical cluster analysis was used to assess the similarity between food categories based on the content of iTFA. Previously, raw data were z-transformed, and the Euclidean distance was used to calculate the similarity among samples. The results were presented in a dendrogram comprising a hierarchical structure. IBM-SPSS-Statistica[®] Software (version 28.0.0, USA) was used for statistical analysis. Based on RDC n° 322/2019, the products were grouped as follows: 1) Food products containing iTFA ≥ 2 g /100 g total fat; or 2) Foods products containing iTFA <2 g /100 g fat.

Results and Discussion

Most labels (n = 1025) were extracted from bakery products, followed by ice creams, frozen foods, snacks, food mixes, chocolates and candies, and sauces and creams (Fig. 1). All categories showed products containing iTFA > 2 g/100 g of total fat, and the presence of PHF or relative terms on the list of ingredients, except for the category sauces and creams (Fig.1). The content of iTFA (g/100 g fat) widely ranged among products in the same category, as following: bakery products (0 to 51.4 g), ice creams (0 to 28.6 g), frozen foods (0 to 27.1 g), snacks (0 to 32.3 g), food mixes (0 to 28.6), and chocolates and candies (0 to 11.5 g). In this sense, 4.6%, 22.7%, 29.4%, 14.3%, 2.4% and 5.1% of products showed iTFA content > 2 g/ 100 g fat for bakery products, ice creams, frozen foods, snacks, food mixes, and chocolates and candies, respectively (Fig. 1). Therefore, these ultra-processed products, especially frozen foods, ice creams, and snacks, need reformulation to comply with the RDC n°322/2019. However, we observed a higher products number with PHF or its relative terms in the list of ingredients for each category than those with iTFA

content above the allowed by Brazilian legislation, demonstrating that even products fitted in the current Brazilian legislation (<2 g/100 g of total fat) require reformulation to guarantee the total elimination of iTFA of food products apart from 2023.

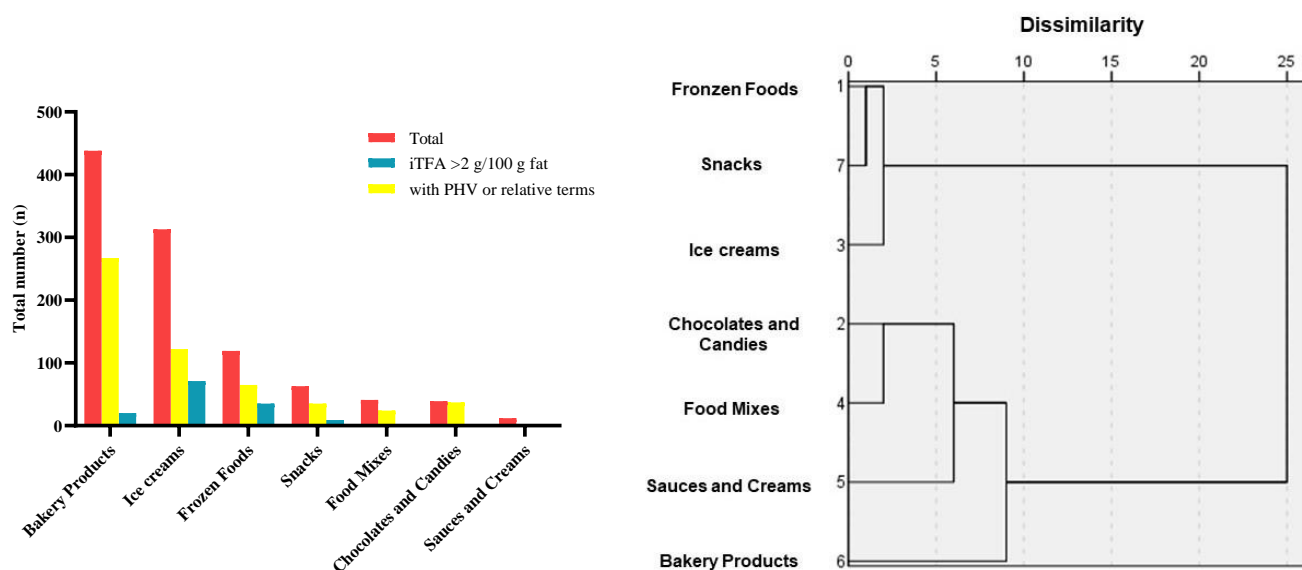


Figure 1. Distribution of products by categories, the content of *trans*-fatty acids > 2 g/100 g of fat, and the presence of partially hydrogenated fat or relative terms on the ingredient list (left). Clustering of food categories according to the content of *trans*-fatty acids in the labels (right).

Accordingly, the food categories are grouped in two major clusters (Fig.1). The first cluster comprised frozen foods, snacks, and ice creams which gathered due to their higher content of iTFA, showing on average 2.83 g/ 100 g of total fat. The second cluster comprised chocolates and candies, food mixes, sauces and creams, and bakery products gathered due to their lower content of iTFA, showing on average 0.57 g/ 100 g of total fat.

Conclusion

Most of the ultra-processed foods evaluated in the present study followed RDC n° 322/2019 with iTFA content <2 g/100 of total fat. However, a fraction of these products continues providing iTFA since the partially hydrogenated fat remains present in their list of ingredients. Therefore, monitoring the presence of iTFA and partially hydrogenated fat in ultra-processed foods, especially in frozen foods, snacks and ice creams, should be constant to promote the elimination of iTFA from the global food supply and to report products that need reformulations.

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