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Ultra-processed frozen and ready to heat foods versus health and wellness trend in Porto Alegre, Rio Grande do Sul state

Alimentos ultraprocessados congelados e ready to heat versus tendência de saúde e bem-estar em Porto Alegre, Rio Grande do Sul

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Abstract

*Objectives:*To verify whether food products classified as ultra-processed frozen and ready to heat, marketed in the city of Porto Alegre, Rio Grande do Sul state, are being manufactured with attributes of the health and wellness trend. *Methods:* A descriptive observational studyof analysis of labelswas carried out at four supermarkets and at onewholeretail store from the city of Porto Alegre-RS. The group of analyzed products includes: pizzas, lasagne, ready-made dishes like Bolognese pasta, *risottos*,nuggets, among others. The choice of the visited unit was based on the predominant location of thelower-middle classin the city of Porto Alegre registered in thePorto AlegreSocioeconomic Analysis 2017. *Results:* 77% of the general sample was classified withexcess fat; 95% with excess sodium; 70% without intentionally added dyes and 78% without preservatives; 11% was considered light in sodium; 74% as non-fiber source and 74% do not use advertising on the label to differentiate the product in the market. Group A had higher weight of the portion (g), higher percentage from total fat (%),total fat (g) and fibers in the portion (g), higher sodium/kcal ratio, higher number of ingredients, oflight products, of products that arefiber sources and the use of advertising on the label. Group B only presented a higheramount of *trans* fat in the portion. *Discussion:* By facing competitors with less "healthy" products on supermarket shelves, large brands continue to bet more on the production and marketing of large volumes than on the health and wellness trend. *Conclusions:*The investigated labels did not exhibit evidences to fit into the line of products that have the attributes of the health and wellness trend. However, in group A, the most recognized brands, it was possible to discreetly

identify some aspects of this trend, such as the presence of light versions, having more grams of fibers in the portion and sources of fibers, less *trans* fat in the portion and no intentional addition of additives. Thus, consumers from thelower-middle class, in Porto Alegre, have in this line of products few alternatives to a healthier diet, which suggests a greater attention to policy makers and practices for a better quality of life related to nutrition.

Keywords: Direct-to-Consumer Advertising. Industrializad Foods. Frozen Foods. Consumer Behavior. Public Health.

Resumo

Objetivos: Verificar se produtos alimentícios classificados como ultraprocessados congelados e *ready to heat*, comercializados na cidade de Porto Alegre-RS, estão sendo fabricados com atributos da tendência de saúde e bem-estar. *Metodologia*: O grupo de produtos analisados inclui: pizzas, lasanhas e pratos prontos como massa à bolonhesa, massa quatro queijos, risotos, *nuggets*, entre outros. A escolha da unidade visitada se baseou na localização predominante da classe econômica C na cidade de Porto Alegre, registrada na Análise Socioeconômica Porto Alegre 2017. *Resultados:* Um total de 77% da amostra geral foi classificado com excesso de gordura; 95% com excesso de sódio; 70% sem corantes adicionados intencionalmente e 78% sem conservantes. Apenas 11% foram considerados *light* em sódio; 74% como não fonte de fibras; e 74% não utilizam publicidade no rótulo para diferenciar seu produto no mercado. O grupo A (das marcas mais lembradas) possuiu maior peso da porção (g), maior porcentagem vindo de gorduras totais (%), gorduras totais (g) e fibras na porção (g), maior relação sódio/kcal, maior número de ingredientes, de produtos *light*, de produtos fontes de fibras e uso de publicidade no rótulo. Já o grupo B (das marcas menos lembradas) apresentou unicamente maior quantidade de gordura *trans* na porção. *Discussão*: Diante de concorrentes com produtos menos "saudáveis" nas prateleiras do varejo supermercadista, as grandes marcas continuam apostando mais na produção e comercialização de grandes volumes do que na tendência de saúde e bem-estar. *Conclusões*: Os rótulos investigados não mostraram evidências para se encaixarem na linha de produtos com atributos da tendência de saúde e bem-estar. No entanto, para o caso de rótulos de produtos congelados *ready to heat* das marcas mais lembradas, foi possível identificar, embora discretamente, alguns aspectos dessa tendência, tais como presença de versões *light*, ter mais gramas de fibras na porção e

fontes de fibras, menos gordura *trans* na porção e não adição de aditivos intencionalmente. Dessa forma, os consumidores da classe econômica C, em Porto Alegre, têm nessa linha de produtos poucas alternativas para uma alimentação mais saudável, sugerindo maior atenção para os formuladores de políticas e práticas para melhor qualidade de vida relacionada à nutrição.

Palavras-chave: Publicidade Direta ao Consumidor. Alimentos Industrializados. Alimentos Congelados. Comportamento do Consumidor. Saúde Pública.

Introduction

Market trends are related to the social and economic conjuncture of a society, being an influence that has durability, capable of projecting the future, and whose impact is perceptible by the change of behavior of individuals.[1] Brazil presents five trends in the food area, which impact the food choices of Brazilians. These are: 1) Sensoriality and Pleasure; 2) Convenience and Practicality; 3) Reliability and Quality; 4) Sustainability and Ethics; 5) Healthiness and Wellness.[2]

Convenience and practicality are decisive in the selection of food products, without discrimination among social classes.[3,2]This is justified because women arecurrently inserted in the labor market, the population has a busy life, it works full time and has little time for family food.[2,4] Thus, industrialized ready-to-eat foods become key choices by adding practicality to meals.[2,4-8]

In Brazil, the health and wellness trend is based on the aging of the population, on the high prevalence of chronic non-communicable diseases (CNCDs), on the greater access to information, on the increased *per capita* income and urbanization.[2] Additionally, 21% of the Brazilian food consumer market chooses its food products considering this trend.[2,9] According to Brasil Food Trends 2020, consumers prefer products that have any of the following attributes:[2] reduction or exemption of fat, sugar or sodium; no use of intentionally added dyes or preservatives; to be rich in fibers, whole, organic, fortified or enriched with vitamins and minerals, destinedfor food restrictions and without *trans* fat.

Healthy eating should be based on the consumption of *in natura* and minimally processed foods.[10] Nevertheless, consumers are seeking ultra-processed foods,[11] which are clearly contraindicated, since their regular consumption is associated with an increase in the incidence of chronic non-communicable diseases (CNCDs) in Brazil.[10,12-14] According to the definition of the *Food Guide* 2014, ultra-processed foods are industrial formulations made with elements unique to this group, such as food additives, and present five or more ingredients that are substances extracted from foods.[10] They also contain elements unique to ultra-processed foods, such as food additives.[10,15]

There is a subcategory of these foods called ready to heat, whose consumption replaces main meals (lunch and/or dinner), such as frozen pizzas and lasagne.[16] These foods may be nutritionally unbalanced because they mighthave high quantities of fat, refined sugar and sodium, be produced with *trans* fat, have a low fiber content and a high energy density (from 2.5 to 5 kcal/g of food).[10,17]

For a healthy diet, excessive consumption of ultra-processed foods is contraindicated.[10] Nonetheless, studies point to the consistent increase in the consumption and acquisition of ready meals and industrialized mixtures by the Brazilian population.[11,15,17-22]

The health and wellness trend is present in all socioeconomic strata. However, thelower-middle class should be highlighted, which represents 52.8% of the consumers in the South of Brazil, and 54% in Porto Alegre-RS.[23] According to the Brazilian Economic Classification Criteria (CCEB), the average household income of this category had as lower and upper limit, respectively: R$ 1,625.00 and R$ 2,705.00 per family.[23] According to the socio-economic analysis of the city of Porto Alegre, this economic stratum resides predominantly in ten regions/neighborhoods of this city.[24]

The Associação Brasileira das Indústrias da Alimentação (Brazilian Association of Food Industries– ABIA) reveals that frozenfood dishes with healthy appeal gain market share because of convenience and health and wellness trends.[6,25] According to the Top Of Mind survey2016, there are five brands of ultra-processed and frozen foods that arethe most remembered by the lower-middle class.[26]

The supermarket is the place where Brazilian families buy food and where the supply of ultra-processed food products is higher.[8] On the other hand, due to the crisis in consumption, the lower-middle class has opted to purchase at wholeretail stores, that are stores which mix wholesale with a lower price appeal.[27,28] According to the Top Of Mind survey 2017, in a survey carried out on Porto Alegre, there are four supermarkets and one whole retail store that are the most remembered by this economic stratum.[29]

With the above context in mind, this study aimed at verifying if food products classified as ultra-processed frozen and ready to heat, commercialized in the city of Porto Alegre-RS, are being manufactured with attributes of the health and wellness trend. In order to reach this objective, a descriptive observational study was carried out, which evaluated quantitative and qualitative parameters. Additionally, these parameters were also compared among the group of the most remembered brands (A) and the group of other brands (B).

Methods

The data collection of this research was carried out from June to September 2017 in the city of Porto Alegre, RS, in five commercial establishments. This is an observational, descriptive study of analysis of food product labels whose inclusion criteria were: to be ultra-processed, commercialized in frozen and ready to heat forms. Seven teen variables in the general sample and 16 parameters were compared between two groups: group A (composed of the five most remembered brands of ultra-processed frozen foods by the lower-middle class, according to the Top Of Mind 2016)[26] and group B (other brands present in the general sample).

Data collection sites

The four supermarkets and the whole retail store cited as "the most remembered by the lower-middle class in Porto Alegre" were selected, according to the Top Of Mind 2017.[29] Visits to the sites took place in the same week and month. An establishment of each commercial group was visited in Porto Alegre. The choice of the visited unit was based on the predominant location of the lower-middle class in the city of Porto Alegre registered in the Porto Alegre Socioeconomic Analysis 2017.[24] Verbal permission to collect data was requested to each manager of the establishments.

Data collection

Photographic recording was carried out of the following items on the food label: unit price of the day, lot, brand, product name, nutritional information, net weight and list of ingredients. The lack of one or more of these aspects set the exclusion criterion, as well as the lack of parameters of mandatory nutrition labeling.[30] All products aimed at children were also excluded. Repeated products in different establishments were counted only once. Different lots of equal products were not recorded.

Quantitative variables

The following quantitative variables were analyzed for each food: unit price ($), weight in grams of the portion, caloric density (kcal/g), percentage ratio of the total fat share in the total energetic value (henceforthTEV), amount in grams of total and *trans* fat in the portion, amount in grams of fibers in the portion and in 100g, ratio of milligrams of total sodium tothe total energetic value and number of ingredients. These variables were analyzed in the general sample and compared between groups A and B (except unit price).

Qualitative variables

Eight categorical variables, of yes/no answer, were analyzed in each food, namely:

1) excess fat (when there was 30% or more of the TEV composed of total fat);[31]
2) excess sodium (when the sodium/kcal ratio was equal to or higher than1:1);[31]
3) presence of *trans* fat (considered *trans* fat when there was a numerical indication above zero in the nutritional table and/or names citation in the list of ingredients that indicates the presence of *trans* fat;[(a)30,32]
4) use of any intentionally added dyes, according to legislation of the AgênciaNacional de VigilânciaSanitária (National Agency of Sanitary Surveillance - ANVISA);[33]
5) use of intentionally added preservatives according to ANVISA;[33]
6) reduction of ingredients according to ANVISA's Resolução da Diretoria Colegiada (Resolution of the Collegiate Board of Directors - RDC) 54 and ingredient in attested reduction;[34]
7) fiber source product (criterion according to ANVISA's RDC 54);[34]
8) presence of advertising on the label (sayings that differentiate the product on the market, such as vegetarian, lactose-free, high-fiber).

All these eight variables were analyzed in the general sample and compared between groups A and B.

Results and Discussion

The statistical analysis was performed in the statistical software SPSS version 18.0. First, the Kolmogorov-Smirnov test was applied to the variable "unit price of the general sample", in order to verify the Gaussian pattern. Due to the abnormality indicated by the result of this test, the quantitative variables were described as median and interquartile range, since they are non-parametric measurements that are little affected by the individual values. To compare the quantitative variables between groups A and B, the Mann-Whitney test was used.

The binomial qualitative variables were described as absolute and relative frequency n (%), analyzed by the Z-test for proportions in the general sample. When comparing these categorical variables between groups A and B, the Chi-square test with Yates' correction was used, since this statistical test compares the frequencies and the proportions observed, and the correction is necessary due to the degree of freedom 1. For all the tests, the significance level of $p < 0.05$ was adopted.

Overall, 121 food products were collected. In these products, the Kolmogorov-Smirnov test was applied to the variable "unit price", which resulted in a non-Gaussian pattern. Thus, this variable was described as a median and interquartile range and, therefore, it was verified that 21 foods had prices above the 75th percentile, which would distort the results.Hence, these 21 products were excluded from the sample.

The Kolmogorov-Smirnov test was applied on 100 food products, and the result remained not normal. However, the sample became more homogeneous, with a mean of R$ 9.77, median of R$ 9.79, upper limit of R$ 14.90 and lower limit of R$ 5.99. From this exclusion, three products were withdrawn from group A (totaling 56 units) and 18 from group B (totaling 44 units).

Due to the asymmetry in the variable "price", verified by the Kolmogorov-Smirnov test, the quantitative parameters are described in table 1 as median and interquartile range.

Table 1. Quantitative variables analyzed in a sample of 100 food products classified as ultra-processed frozen and ready to heat, commercialized in the city of Porto Alegre-RS, 2017.

Quantitative variable	Median (p25-p75)*
Portion weight (g)	130 (100-300)
Energy density (kcal/g)	1,5 (1.2-2,2)
% of the TEV from total fat	35.7 (30.4-41.7)
Total fat in the portion (g)	10.5 (5.8-17.0)
Trans fat in the portion (g)	0 (0-0.5)
Fibers in the portion (g)	1.8 (1.2-2.6)
Sodium kcal ratio	2.5 (1.95-3.1)
Number of ingredients	18 (13-23)

*quantitative variables, described as median, which represents the measure of central trend and interquartile range, in which P75 means that 75% of the sample has an equal to or lower value than the one identified, and P25, 25% of the sample, equal to or lowervalue than the one indicated..

It is possible to observe the high ratio of sodium (mg) per kcal, since 25% of the sample presents 1.95 mg of sodium, or less, for each kcal of food. It is also evidenced the high occurrence of total fat in the composition of the total energetic value of foods, with values equal to or lower than 30.4% in only 25% of the sample.

Regarding the qualitative variables, because they were categorical, they were analyzed by the Z-test for proportions. According to the result shown in table 2, only the variable "presence of *trans* fat" was not statistically significant (p = 0.193).

Table 2. Qualitative variablesanalyzed in a sample of 100 food products classified as ultra-processed frozen and ready to heat, commercialized in the city of Porto Alegre-RS, 2017.

Categorical variable	%(n)
Excess fat*	
Yes	77 (77)
No	23 (23)

continue

Categorical variable	%(n)
Excess sodium*	
Yes	95 (95)
No	5 (5)
Presence of trans fat	
Present	43 (43)
Absent	57 (57)
Food without dye*	
Yes	70 (70)
No	30 (30)
Food without preservative*	
Yes	78 (78)
No	22 (22)
Ingredient reduction*	
Yes	11 (11)
No	89 (89)
*Light in sodium**	
Yes	11 (11)
No	89 (89)
Fiber source*	
Yes	26 (26)
No	74 (74)
Advertising on the label*	
Yes	26 (26)
No	74 (74)

*statistically significantbinomial categorical variables ($p < 0.01$) described as absolute and relative frequency n (%), analyzed by the Z-test for proportions, in which the significance level of $p < 0.05$ was adopted.

It is possible to observe that the samples show excess sodium (95%), excess fat (77%), preference for not intentionally adding dyes and preservatives in the formula, for containing foods considered

light in sodium (11%) and 74% not being fiber sources. Furthermore, it was observed that 26% of the samples presented advertising in order to differentiate their product.

In the analyzed labels, the following words were found: "light", "30% less sodium", "zero lactose", "whole fiber source", "preservative free", "gluten free", "fiber source" "low glycemic index", "*trans* fat free", "no added preservatives", "with natural seasonings", "vegetarian", "vegan" and "protein source".

When the quantitative variables were compared between groups A and B, the Mann-Whitney test was applied. The respective results are presented in table 3.

Table 3. Quantitative variables compared between groups A and B in a sample of 100 food products classified as ultra-processed frozen and ready to heat, commercialized in the city of Porto Alegre-RS, 2017.

Variable	Group A (median (p25-p75)	Group B median (p25-p75)	P value
Portion weight (g)*	175 (100-300)	112.50 (77-237.5)	0.017
Energy density (kcal/g)	1.5 (1.2-2.3)	1.5 (1.25-2.15)	0.920
% of the TEV from total fat*	38.7 (32.6-42.35)	33.5 (28.9-40.2)	0.024
Total fat in the portion* (g)	13 (7.85-17.0)	6.65 (4.95-15.0)	0.007
Trans fat in the portion* (g)	0 (0-0.2)	0 (1-1.2)	0.036
Fibers in the portion* (g)	2.2 (1.5-3.6)	1.3 (0.97-1.85)	<0.001
Sodium kcal ratio*	2.65 (2.15-3.3)	2.25 (1.65-2.8)	0.006
Number of ingredients*	20 (17-24)	14 (10.5-19.5)	0.001

*statistically significant variables analyzed by the Mann-Whitney test; a significance level of 0.05 was adopted.

It is possible to observe the parameters in which group A obtained higher values compared to group B, namely: weight in grams of the portion,% of TEV from total fat, amount in grams of total fat in the portion, amount in grams of fiber in the portion, sodium/kcalratio and number of ingredients. Group B, on the other hand, presented higher amounts, in grams, of *trans* fat in the portion. There was no statistically relevant difference between groups on caloric density. It is worth noting that group A is composed of four of the five most remembered brands of ultra-processed frozen foods by the lower-middle class, since one of the brands was not found in the present study.

To compare the qualitative variables between groups A and B, the Chi-square test with Yates' correction was used, as shown in table 4.

Table 4. Qualitative variables compared between groups A and B in a sample of 100 food products classified as ultra-processed frozen and ready to heat, commercialized in the city of Porto Alegre-RS, 2017.

Categorical variable	Group A n(%)	Group B n(%)	P value
Excess fat			0.106
Yes	47 (83.9)	30 (68.2)	
No	9 (16.1)	14 (31.8)	
Excess sodium			0.230
Yes	55 (98.2)	40 (90.9)	
No	1 (1.8)	4 (9.1)	
Presence of trans fat			0.520
Present	22 (39.3)	21 (47.7)	
Absent	34 (60.7)	23 (52.3)	
Food without dye			0.455
Yes	37 (66.1)	33 (75.0)	
No	19 (33.9)	11 (25.0)	
Food without preservative			0.566
Yes	42 (75.0)	36 (81.8)	
No	14 (25.0)	8 (18.2)	
Ingredient reduction*			0.005
Yes	11 (19.6)	0 (0)	
No	45 (80.4)	44 (100)	
*Light in sodium**			0.005
Yes	11 (19.6)	0 (0)	
No	45 (80.4)	44 (100)	
Fiber source*			0.006
Yes	21 (37.5)	5 (11.4)	
No	35 (62.5)	39 (88.6)	
Advertising on the label*			0.023
Yes	20 (35.7)	6 (13.6)	
No	36 (64.3)	38 (86.4)	

*statistically significant binomial categorical variables analyzed by the Chi-square test with Yates' correction; a significance level of 0.05 was adopted.

Table 4 presents the four variables whose results show significant differences between groups. Group A has the highest number of fiber source products compared to B. However, the two cannot be considered sources of fiber, since 89.6% of the sample of group B and 62.5% of A are negative for this parameter.

Similarly, it is group A that presents food products classified as light in sodium (only 11% of itssample);however, it presents 98.2% of its products with excess sodium. In addition, although in both groups there are few products with advertising on the label, group A presents a higher number of food products with sayings that differentiate them from others, such as: "30% less sodium", "whole fiber source", "preservative free", "vegetarian" and "with natural seasonings".

The present study aimed at verifying whether ultra-processed frozen and ready to heat food products marketed in Porto Alegre - RS are being manufactured with attributes of the health and wellness trend. In order for a food to fit this trend, it must present some of the eight relevant aspects listed by Brasil Food Trends 2020.[2] However, the item "whole food" was not discussed due to a lack of consensus on this definition. The item "organic food" was also not evaluated, because the concept of ultra-processed food makes it impossible to be considered organic.

Similarly, there was no evaluation of "fortified and enriched foods", since according to ANVISA's Ordinance No. 31/2002, the differentiation between micronutrients added for nutritional purposes and for purposes of dyeing and conservation is very tenuous. Moreover, the amount of sugars in foodswas not analyzed because the ready to heat definition refers to salty preparations that replace the main meals lunch and/or dinner.

Instinctively, the consumer compares price ($) and portion weight (g) to calculate a false "benefit cost". The results of this research indicate that the weight of the portion is higher in the group of the most remembered brands (A). Considering the higher level of clarification about the consumer behavior of this group, this result is not surprising. Larger portions and higher caloric density stimulate exacerbated consumption, contributing to the obesity epidemic and the incidence of CNCDs.

According to the*Food Guide for the Brazilian Population*2014, ultra-processed foods have a high energy density, ranging from 2.5 to 5.0 kcal/g.[10] This study, however, showed lower values. The general sample had a median of 1.5 kcal/g, and there was no statistical difference between the groups. This shows a change in the composition of these food products. Nonetheless, they still have a higher value than the basic dish of Brazilian food: rice and beans (1.0 kcal/g).[10]

Since 2007, the Ministry of Health has negotiated with ABIA to reduce fats in processed foods.[35] However, the group of ultra-processed foods has not been included in this reformulation. It is possible to observe from the results of the current research that 77% of the general sample shows

excess fat - which, according to the Pan American Health Organization (PAHO) criteria, is when the total fat share in the composition of the TEV is equal to or higher than 30%.[31] In addition, group A had the highest amount of total fat in grams in the portion, a higher percentage of the TEV from total fat and more products withexcess fat (83.9%, whereas group B had 68.2%).

In addition to the amount of fat, it is necessary to consider the amount of hydrogenated fat, since there is a strong association between consumption of *trans* fat and cardiovascular diseases, since it contributes to the development of atherogenesis, dyslipidemia and hard endpoints.[13,14] The general sample of the current research shows a small amount of this fat in the portions - 75% of the sample has amounts equal to or lower than 0.5g/portion and 50%, less than zero. The daily consumption recommended by PAHO is at most 1% of the individual daily TEV.[31] On a 2,000 kcal diet, the maximum daily portion would be 2.2g of*trans* fat.

It should be noted that ANVISA's RDC 360 allows 0.2 g of *trans* fat to be considered zero, however, this does not mean that the product does not contain this ingredient.[30]Thus, the presence of *trans* fat was quantitatively and qualitatively evaluated and it was found that 43% of the food products in the general sample have ingredients with *trans* fat in the composition. Similar results were found in another study.[32]The results of the current research also show that group B presented the highest amount in grams of *trans* fat in the portion.

The daily intake of adequate amounts of fiber is fundamental due to its protective effects against cardiovascular diseases, hypertension, diabetes, obesity and colon cancer.[13,36] Preferably, fiber intake must come from *in natura* or minimally processed foods.[10] However, consumers are looking for ultra-processed products and their consumption is gradually increasing, as indicated by several studies.[11,15,17-22]

What the results of the present study show is that, although group A shows a larger quantity of fibers in grams in the portion and number of fiber source products (37.5%) compared to group B (11.4% fiber source), 74% of the general sample does not fit the criterion of ANVISA's RDC 54 for a source of fibers.[34]For they are notreference food for this parameter, we agree with the results found by Bieleman[17] and Laura et al.[37]

In Brazil, in 2014, the Ministry of Health signed the third commitment term with ABIA to reduce sodium by 2020 in processed products.[38]Nevertheless, ultra-processed foods have not been included in the government's priority list for reduction.[22] The results of this study show that 95% of the general sample has excess sodium, with group A having the highest sodium/kcal ratio, since only 25% of its sample obtained value equal to or lower than 1,95 mg of sodium for each kcal of food, while the recommended value by PAHO is at most up to 1 mg per kcal. Therefore, although group A has products with light sodium versions (19.6% of its sample), 98.2% of its products remain with excess of this micronutrient. It is worth noting that light food is not the

same as healthy food, since the reduction of one element may be replaced by another ingredient in an excessive and unbalanced way.[39]

The results obtained regarding sodium, total and *trans* fat are worrisome, considering the direct contribution of these factors in the incidence and prevalence of CNCDs.[10,12-14,17] The lower-middle class represents today approximately 50% of the consumer market, and the consumption of ultra-processed foods has been increasing, according to statistical data.[11,15,17-22] Consumers of this social class demand changes in the formulas.[40] Regular consumption of products with excess sodium, fat, low fiber intake and that present *trans* fat has a negative impact on the health of a rising economic class that demands healthier products without giving up the convenience, practicality and flavor.[10,12,40]

The *Food Guide* 2014 shows that ultra-processed foods have more than five ingredients.[10] The results of the present research agree with this reference and show that group B has fewer listed ingredients when compared to group A. It is a trend to reduce the number of ingredients labeled "clean labels".[1] However, the smallest amount in this group (B) may be associated with sensory and taste issues of the food product.

Thus, both groups have excess fat and sodium, hence the amount of extra ingredients in group A would not necessarily be raw material based on fat and salt, which would make the product more palatable. It is worth mentioning that this study did not evaluate product sensory issues, although they do exist among brands. It is well-known that group A, being composed of large food companies, has more financial resources to invest in technology and sensory research. Therefore, to enter this competitive market, it is necessary to captivate the consumer through taste.

The results of this study show a preference for not intentionally adding dyes (70%) and preservatives (78%) in the general sample, with no statistical difference between the groups. However, this does not mean that these ultra-processed foods do not have these elements, due to the principle of transfer of additives.[41] The raw materials used in the formulation of the product may already contain added dyes and preservatives, which makes it unnecessary to report them in the list of ingredients or add them in the final product.

It is worth emphasizing the importance of preservatives to ensure that food is safe for consumption. In the current social conjuncture, dyes and preservatives have been the focus of several studies, attesting to their possible harm to humans.[42] However, before a food is "preservative free" and adapts to new trends, the food product must be safe for consumption.[41] Thus, the role of preservatives goes beyond extending validity and cheapening costs.

Conclusion

The results of this study point to the general panorama of the sample, through which it is possible to identify attributes of the health and wellness trend being considered by the group of the most remembered brands. Group A, then, composed of large food companies, has more discernment about market trends than Group B, the one of the least remembered brands.

It was possible to observe, in particular for group A, a slight attempt to engage with the health and wellness trend, directed towardsthe lower-middle class, since it presents advertising on the label to direct its product in the market (35.7% of their sample, while group B has 13.6%). Group A has foods with light versions (19.6%), it has a higher amount in grams of fiber in the portion and fiber source products, it prefers not to intentionally add dyes and preservatives in the manufacture and it presents less *trans* fat in the portion. However, there is still much to progress, because they continue to be products with excess sodium, excess fat, they have few versions with reduction of ingredients which maintain the balance in the composition.

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Contributors

Kruel JP worked in all stages, from the design of the study to the revision of the final version of the article; she went to the field to collect the data of the research for her undergraduate thesis of the Nutritional Sciences Program. Gurak PD participated in all stages, from the design of the study to the revision of the final version of the article. Concha-Amin M participated in the initial design of the study and in its final version for submission.

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