

Acquisition of food for away-from-home consumption in Brazil between 2002 and 2018

Aquisição de alimentos para consumo fora do domicílio no Brasil entre 2002 e 2018

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Abstract *The aim of the study was to assess the evolution of food acquisition for away from home consumption in Brazil from 2002 to 2018. The trend of food purchases for out-of-home consumption in Brazil was evaluated by comparing food purchase data from the Household Budget Surveys (HBS) of 2002-2003, 2008-2009, and 2017-2018. The frequency of food acquisition was estimated according to sociodemographic variables and the mean cost. In 2002-2003, the frequency of purchase of food for out-of-home consumption was 35.2% (95%CI: 34.4-35.9), increasing to 41.2% (95%CI: 40.4-42.0) in 2008-2009, followed by a decline in 2017-2018 (32.3%; 95%CI: 31.7-32.9). A declining trend was observed in the frequency of purchases of alcoholic beverages and soft drinks and fast foods maintained the frequency between the last two surveys. Spending on this type of food increased between 2002-2003 and 2008-2009, while the mean value of this type of expenditure was maintained between 2008-2009 and 2017-2018. Brazilians increased food purchases for out-of-home consumption between 2002-2003 and 2008-2009, declining in 2017-2018. A consistent fall in the purchase of alcoholic beverages and soft drinks was observed over time, while the group of meals grew significantly.*

Key words *Food consumption, Nutrition surveys, Food surveys, Eating habits, Consumer behavior*

Resumo *O objetivo desse estudo foi avaliar a evolução da aquisição de alimentos para consumo fora de casa no Brasil de 2002 a 2018. A tendência de compra de alimentos para consumo fora de casa no Brasil foi avaliada pela comparação de dados de compra de alimentos das Pesquisas de Orçamentos Familiares (POF) de 2002-2003, 2008-2009 e 2017-2018. A frequência de aquisição de alimentos foi estimada de acordo com variáveis sociodemográficas e o custo médio. Em 2002-2003, a frequência de compra de alimentos para consumo fora do domicílio foi de 35,2% (IC95%: 34,4-35,9), aumentando para 41,2% (IC95%: 40,4-42,0) em 2008-2009, seguido por um declínio em 2017-2018 (32,3%; IC95%: 31,7-32,9). Foi observada tendência de queda na frequência de compras de bebidas alcoólicas e refrigerantes, enquanto fast food manteve a frequência entre as duas últimas pesquisas. Os gastos com esse tipo de alimentação aumentaram entre 2002-2003 e 2008-2009, enquanto o valor médio desse tipo de gasto se manteve entre 2008-2009 e 2017-2018. Os brasileiros aumentaram as compras de alimentos para consumo fora de casa entre 2002-2003 e 2008-2009, diminuindo em 2017-2018. Uma queda consistente na compra de bebidas alcoólicas e refrigerantes foi observada ao longo do tempo, enquanto o grupo das refeições apresentou aumento significativo.*

Palavras-chave *Consumo alimentar, Inquéritos nutricionais, Inquéritos alimentares, Hábitos alimentares, Comportamento do consumidor*

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Introduction

The food consumption of the Brazilian population has changed in recent years, with a decrease in the purchase of typical Brazilian cultural foods and an increase in the consumption of semi-ready or ready-to-eat foods and out-of-home food¹. The Household Budget Surveys results from 2002 to 2018 indicate an increase of 8.7% in the monthly expenditure on out-of-home food in the country².

The more frequent the consumption of food outside the home, the greater the intake of ultra-processed foods³. Studies in different countries show that frequent out-of-home meals are associated with high caloric consumption, a low-quality diet, and greater weight gain⁴⁻⁷.

In other countries, expenditures and caloric intake of out-of-home food consumption have increased, and spending on out-of-home consumption surpassed home consumption in some locations. Also, the number of food service establishments and the demand and availability of this type of food increased, especially in fast-food restaurants^{8,9}. In Brazil, Claro *et al.*¹⁰ evaluated the trend of expenses with out-of-home food, analyzing the influence of income on these expenses. However, the analysis referred to a short period (2002/2003 and 2008/2009) and when the country was going through an important economic development (between 2002 and 2009).

Investigating the trend in this consumption provides a better understanding of the trend of this habit in the country and a basis for intervention strategies in the out-of-home food sector. This paper aims to evaluate the trend of food acquisition for out-of-home consumption in Brazil from 2002 to 2018.

Materials and methods

This research compared data on food purchases for out-of-home food consumption from the last three Brazilian Household Budget Surveys (HBS), carried out in 2002-2003, 2008-2009 and 2017-2018. These nationwide surveys, conducted by the Brazilian Institute of Geography and Statistics (IBGE), provide data on the budget structure of households, living conditions, and the population's nutritional status.

HBS data are in the public domain, available on the website of the Brazilian Institute of Geography and Statistics (IBGE - https://ww2.ibge.gov.br/home/mapa_site/mapa_site.php#popula-

cao). Details on sample selection and data collection can also be found at the same address.

In summary, for the 2002-2003 HBS, households were sampled by cluster in two stages. In the first stage, the units sampled corresponded to the tracts of the geographic base of the 2000 Demographic Census. The tracts were stratified geographically and by socioeconomic characteristics of the stratum based on the years of study of the person responsible for the household. The tracts were selected by systematic sampling with probability proportional to the number of households per tract. The units sampled corresponded to households in the second stage, selected by simple random sampling within the selected census tracts.

A master sample was used for selecting the population of the 2008-2009 and 2017-2018 HBS, originated from the Integrated System of Household Surveys of the IBGE, which corresponds to a common sample register, consisting of several census tracts, which are considered the primary sample units in the sample planning. The selection of tracts that underpin the master sample followed statistical sampling by cluster in two stages. The first stage corresponded to selecting some census tracts from the master sample, and the second stage comprised the selection of households for each chosen census tract.

The sampling technique used in the three surveys is comparable, allowing selected population segments in the five Brazilian regions, urban and rural areas, and different socioeconomic levels to represent the population in the three years investigated. Data collection from the surveys was carried out over 12 months, uniformly in the strata, ensuring representativeness in the four quarters of the year.

A total of 48,470 households were investigated in 2002-2003 HBS; 55,970 households in the 2008-2009 HBS and 57,920 in the 2017-2018 HBS. We considered only residents over ten years of age who contributed to the household budget for this study. Thus, the final sample totaled 146,525 individuals in the 2002-2003 HBS, 158,182 individuals in the 2008-2009 HBS, and 154,070 individuals in the 2017-2018 HBS.

In the three surveys, data regarding the purchase of food for out-of-home consumption were obtained through the individual expenditure questionnaire, in which the individual recorded the products purchased, the way of obtaining them, the place of purchase, and amount paid for seven days. The registration of items was carried out item by item or in aggregates (combination

of several purchases of the same item, with the total amount spent in the week). Out-of-home eating was defined as purchasing food for consumption outside the home, which was intended for the home of the individual who purchased the food during the week of data collection.

Foods obtained for out-of-home consumption were classified into ten food groups based on the nutritional and the selling characteristics of the items: alcoholic beverages (including, for example, beers, wines, and draft beer), fruit juices, soft drinks (soft drinks of different flavors and types), cereals (cookies, cakes, and bread), fruit, sweets (chocolate, candies, fruit sweets, ice cream, and desserts) milk and dairy products (milk, smoothies, yogurts, and cheeses), meals (kilo and la carte lunch and dinner, and lunch and dinner at school), fast foods (sandwiches, fast food lunch or dinner), fried and baked snacks (snacks, esfihas, and savory pies).

This categorization was based on the most representative characteristics of the item mentioned. The foods consumed together were considered in more than one group, for example, fried snacks and soft drinks were computed in the soft drinks and fried and baked snacks groups.

The frequency of food purchase for out-of-home consumption was estimated by gender, age group, per capita household income, schooling, household status (urban or rural), and the country's five regions. Age was categorized into three age groups: adolescents (10-19 years old), adults (20-59 years old), and older adults (60 years old or more). Schooling was classified by years of study, considering: up to 4 years, 5-8 years, 9-11 years, and 12 years or more. To categorize this variable, we considered only individuals over 25 years of age, as this is the estimated mean time required to complete the educational cycle (higher level). Per capita household income was estimated dividing household income by the number of residents. This variable was stratified into income quartiles in each period for analysis.

The frequency of out-of-home consumption of each food group was also calculated by the household situation, age group, and income. The mean total expenses and expenses for each food group purchased and consumed outside the home were measured considering the total amount paid and multiplied by the deflator index. Thus, expenditures for 2002-2003 and 2008-2009 were updated by the Broad Consumer Price Index calculated by the Brazilian Institute of Geography and Statistics (IBGE), with the 2018 base year, to enable comparison with expenditures for

2017-2018. We employed linear regression models, with the year of the survey as the independent variable and the expenses of each food group as the dependent variables, to assess changes in expenses. Since in time series data errors are serially correlated, we performed posteriori tests, using autoregressive regression models for time series, correcting for data autocorrelation and heteroscedasticity. We considered a significance level of 5%.

The analyses were performed using the SAS software version 9.1 (Statistical Analysis System), considering the expansion factors and the complexity of the sample.

Results

The frequency of purchase of food for out-of-home consumption increased between 2002-2003 (35.2%; 95%CI: 34.4-35.9) and 2008-2009 (41.2%; 95%CI: 40.4-42.0), followed by a decline in 2017-2018 (32.3%; 95%CI: 31.7-32.9). This feature was observed in all age groups, among men and women, less-educated individuals, and all income quartiles. However, the increase in income showed a direct association with the increase in the frequency of purchase for out-of-home consumption in the three surveys. On the other hand, the declining frequency was more pronounced among those with higher monthly per capita income (Table 1).

The differences in acquisition percentages between urban and rural areas reduced over the years, from 8.1% in 2002-2003 to 12.9% in 2008-2009 and to 5.0% in 2017-2018. This difference is due to the lower frequency of food acquisition for out-of-home consumption in the urban area. Rural area presented stable percentages over the years (Table 1). Discrepancies between Brazilian regions were also noted. The Southeast region had the highest percentage between 2002-2003 and 2008-2009. However, the Midwest was the region with the highest frequency in 2017-2018. This region was the only one that showed an increase in percentages over the years (Table 1).

The frequency of purchases of alcoholic beverages and soft drinks has reduced over the years, while fried and baked snacks showed a decline between 2002-2003 and 2008-2009, followed by an increase in 2017-2018. Fast foods fell in the first surveys, remaining stable in the last survey. Fruit was the group with the lowest percentage of acquisitions between 2002-2003 and 2017-2018 and showed an increase between 2002-2003 and

2008-2009, maintaining the frequency in the following period (Table 2).

Some differences were observed between urban and rural areas. In the rural area, fruit juices, fruit, fast foods, and fried and baked snacks remained stable over the years. In the urban area, the first group expressed a decline between the last two periods, and fast foods and fried and baked snacks reduced the frequency during this period (Table 2).

Considering the three age groups, there was an increase in the purchase of snacks and sweets until 2008-2009, with a subsequent decline in 2017-2018 among adolescents. Among older adults, the acquisition of the group of fruit, sweets, and fast foods has not changed over the years. However, the soft drinks and fruit juices groups showed a percentage reduction only in 2017-2018 in this age group (Table 3).

Concerning income, the group that showed the most significant difference between individuals with lower and higher income was meals, with a significant increase in the percentage of purchases, except for the period 2008-2009 and 2017-2018 between the individuals in the last quarter of income (Table 4).

When evaluating expenses with out-of-home food, an increase in expenses with this type of food can be observed between 2002-2003 and 2008-2009, maintaining the mean of this type of expense between 2008-2009 and 2017-2018. We observed a critical decline in the mean spending on beverages and a significant increase in the mean spending on meals. We also found a significant increase in fruit purchase spending (+125%) and meals (+11.2%) between 2002-2003 compared to 2017-2018, while spending on alcoholic beverages and soft drinks significantly

Table 1. Frequency (%) and 95% confidence interval (95%CI) of acquisition of food for out-of-home consumption, according to sociodemographic variables and survey year. Brazil, 2002-2003, 2008-2009, 2017-2018.

Variables	2002-2003 (n=146,525)	2008-2009 (n=158,182)	2017-2018 (n=154,070)
	% (95%CI)	% (95%CI)	% (95%CI)
Age group			
10-19 years old	30.6 (29.3;31.9)	37.7 (36.4;39.0)	26.5 (25.6;27.5)
20-59 years old	39.7 (38.8;40.6)	45.7 (44.9;46.6)	36.8 (36.1;37.5)
≥60 years old	19.0 (17.8;20.2)	24.2 (23.1;25.3)	21.9 (21.1;22.9)
Sex			
Men	39.1 (38.2;40.0)	44.0 (43.1;44.9)	33.5 (32.8;34.2)
Women	31.4 (30.5;32.3)	38.5 (37.6;39.3)	31.3 (30.6;31.9)
Area			
Urban	36.5 (35.6;37.4)	43.3 (42.4;44.1)	33.1 (32.4;33.7)
Rural	28.4 (26.9;30.0)	30.4 (28.8;32.0)	28.1 (26.4;29.7)
Education (years of study)			
Until 4 years	25.3 (24.4;26.1)	27.2 (26.2;28.0)	19.2 (18.3;20.1)
4 to 8 years	37.1 (35.8;38.5)	41.4 (40.0;42.7)	26.0 (25.1;26.9)
9 to 11 years	46.3 (44.8;47.8)	50.1 (48.7;51.4)	29.9 (28.8;31.2)
More than 12 years	59.0 (56.8;61.1)	62.1 (60.4;63.8)	43.0 (42.0;43.9)
Region			
North	28.2 (26.7;29.6)	37.3 (35.7;38.9)	22.8 (21.4;24.2)
Northeast	32.5 (31.3;33.6)	35.9 (34.9;37.0)	35.3 (34.2;36.3)
Southeast	38.8 (32.3;40.4)	47.2 (45.7;48.7)	30.8 (29.7;31.9)
South	34.8 (33.2;36.4)	38.5 (36.7;40.3)	32.5 (31.2;33.7)
Midwest	30.9 (29.5;32.3)	34.3 (32.7;35.8)	40.5 (38.5;42.5)
Income (quartile)			
1 st	24.2 (23.1;25.2)	28.4 (27.3;29.5)	22.7 (21.8;23.6)
2 nd	31.0 (29.9;32.1)	37.5 (36.4;38.6)	27.9 (27.0;28.8)
3 rd	37.2 (36.0;38.4)	43.4 (42.2;44.6)	32.9 (31.9;33.8)
4 th	48.6 (47.0;50.1)	55.3 (53.9;56.7)	45.9 (44.7;47.0)

Source: Authors.

reduced in the first (-50.1%) and in the second survey (-67.3%) (Table 5).

Discussion

The purchase of food for out-of-home consumption in Brazil increased between 2002-2003 and 2008-2009, with a subsequent decline in 2017-

2018 in all age groups, among men and women, in the country's urban areas, among individuals with less education and at all income levels. This increase in purchases between 2002 and 2008 can be explained by the higher household income and shrinking inequality in income distribution between 2004 and 2010 in the country^{11,12}. However, the economic crisis of mid-2014 brought about changes in this scenario, which made pur-

Table 2. Evolution of the frequency (%) and 95% confidence interval (95%CI) of acquisition, by food group, for out-of-home consumption, according to household area and survey year. Brazil, 2002-2003, 2008-2009, 2017-2018.

Brazil			
Food group	2002-2003 (n=146,525)	2008-2009 (n=158,182)	2017-2018 (n=154,070)
	% (95%CI)	% (95%CI)	% (95%CI)
Alcoholic beverages	6.4 (6.1;6.6)	4.7 (4.5;4.9)	2.8 (2.6;2.9)
Fruit Juices	4.7 (4.5;5.0)	5.1 (4.8;5.3)	3.5 (3.3;3.7)
Soft drinks	12.1 (11.6;12.5)	10.1 (9.7;10.5)	4.8 (4.6;5.0)
Cereals	4.5 (4.2;4.7)	4.6 (4.4;4.9)	4.6 (4.4;4.8)
Fruit	0.6 (0.5;0.7)	1.0 (0.9;1.1)	1.1 (1.0;1.2)
Sweets	9.5 (9.1;9.9)	9.3 (8.9;9.7)	4.8 (4.5;5.1)
Milk and dairy products	2.3 (2.1;4.4)	0.9 (0.8;1.0)	1.7 (1.6;1.8)
Meals	9.2 (8.8;9.6)	15.3 (14.7;15.9)	17.7 (17.2;18.1)
<i>Fast Foods</i>	7.2 (6.9;7.5)	6.2 (5.9;6.5)	5.7 (5.5;6.0)
Fried and baked snacks	9.2 (8.8;9.5)	7.1 (6.8;7.4)	8.0 (7.7;8.3)
Urban			
Food group	2002-2003 (n=113,005)	2008-2009 (n=120,446)	2017-2018 (n=118,425)
	% (95%CI)	% (95%CI)	% (95%CI)
Alcoholic beverages	6.4 (6.1;6.7)	4.7 (4.5;5.0)	2.7 (2.6;2.9)
Fruit Juices	5.1 (4.8;5.4)	5.4 (5.1;5.7)	3.5 (3.3;3.7)
Soft drinks	12.8 (12.3;13.2)	10.7 (10.3;11.2)	4.9 (4.7;5.1)
Cereals	4.5 (4.2;4.7)	4.7 (4.4;5.0)	4.5 (4.3;4.8)
Fruit	0.6 (0.5;0.7)	1.0 (0.9;1.1)	1.1 (1.0;1.2)
Sweets	9.7 (9.2;10.1)	9.7 (9.3;10.2)	5.0 (4.7;5.3)
Milk and dairy products	2.3 (2.1;2.5)	0.9 (0.8;1.0)	1.7 (1.6;1.8)
Meals	10.0 (9.6;10.4)	16.8 (16.2;17.4)	18.4 (17.9;18.9)
<i>Fast Foods</i>	8.0 (7.6;8.4)	6.8 (6.4;7.2)	6.2 (6.0;6.5)
Fried and baked snacks	9.6 (9.2;10.0)	7.3 (7.0;7.7)	8.2 (7.9;8.5)
Rural			
Food group	2002-2003 (n=33,520)	2002-2003 (n=33,520)	2002-2003 (n=33,520)
	% (95%CI)	% (95%CI)	% (95%CI)
Alcoholic beverages	6.1 (5.6;6.6)	4.7 (4.3;5.2)	2.9 (2.5;3.2)
Fruit Juices	2.8 (2.5;3.2)	3.4 (3.0;3.8)	3.9 (3.3;4.5)
Soft drinks	8.4 (7.8;9.1)	7.3 (6.7;7.8)	4.3 (3.9;4.8)
Cereals	4.3 (3.8;4.8)	4.5 (4.0;5.0)	5.1 (4.5;5.7)
Fruit	0.8 (0.5;1.2)	1.2 (1.0;1.4)	1.2 (0.9;1.4)
Sweets	8.2 (7.3;9.1)	7.0 (6.3;7.7)	3.9 (3.4;4.5)
Milk and dairy products	1.9 (1.6;2.2)	0.8 (0.6;1.0)	2.0 (1.7;2.3)
Meals	4.9 (4.4;5.4)	8.0 (7.1;8.7)	13.4 (12.4;14.4)
<i>Fast Foods</i>	3.2 (2.8;3.5)	3.1 (2.7;3.4)	2.8 (2.5;3.1)
Fried and baked snacks	7.0 (6.4;7.6)	5.9 (5.4;6.5)	6.6 (6.0;7.2)

Source: Authors.

chasing power decrease in the following years^{13,14}, thus explaining the reduction observed in the 2017-2018 survey.

Corroborating these findings, Barbosa *et al.*¹⁵, when evaluating population-based data for Brazil from 2011 and 2015, also found a reduction in the frequency of out-of-home consumption. Bezerra *et al.*¹⁶, when describing the evolution of out-of-home food consumption in Brazil, analyzing data from the National Dietary Surveys (INA), from 2008-2009 and 2017-2018, which used data from food records in 2008-2009 and 24-hour recalls in 2017-2018, also found a decrease in the frequency of consumption out-of-home. The authors observed a decreased by 8.8% between the two surveys.

The country's rural area has maintained frequencies over the years, and an increase was observed in the Midwest in the percentage of acquisitions throughout the period. Similar results were observed by Bezerra *et al.*¹⁶, when describing the evolution of food consumption out-of-home in Brazil in the period 2008–2018.

This growing frequency of purchases only in the Midwest may have been driven by the high mean income compared to other Brazilian regions². The value of the mean monthly household expenditure on out-of-home food in this region was the highest in the country (R\$ 277.68)². Observing the behavior of each food group, meals were the group that presented the highest elevation of frequency of acquisition, from 8,9% (95%CI: 8,3-9,7) in 2002-2003, to 12,8% (95%CI: 11,7-13,9) in 2008-2009, and 23,9% (95%CI: 22,4-25,5) in 2017-2018 (data not shown).

The maintenance of food acquisition frequencies for out-of-home consumption in the country throughout the three surveys reduced the discrepancies in percentages between urban and rural areas. The Brazilian rural area has been undergoing transformations resulting from its use as an instrument to promote the country's economic growth, which favored structural changes in the countryside, reducing the discrepant lifestyles between rural and urban areas.

Table 3. Evolution of the frequency (%) and 95% confidence interval (95%CI) of acquisition, by food group, for out-of-home consumption, according to age groups and survey year. Brazil, 2002-2003, 2008-2009, 2017-2018.

Food group	Adolescents (10-19 years old)			Adults (20-59 years old)			Elderly (<60 years old)		
	2002-2003 (n=38,509)	2008-2009 (n=35,760)	2017-2018 (n=29,247)	2002-2003 (n=92,733)	2008-2009 (n=102,308)	2017-2018 (n=98,602)	2002-2003 (n=15,283)	2008-2009 (n=20,114)	2017-2018 (n=26,221)
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Alcoholic beverages	1.9 (1.7;2.2)	1.0 (0.9;1.2)	0.7 (0.6;0.9)	8.5 (8.2;8.9)	6.4 (6.0;6.6)	3.5 (3.3;3.7)	3.9 (3.4;4.5)	2.7 (2.3;3.1)	2.0 (1.8;2.3)
Fruit Juices	3.5 (3.1;3.8)	4.1 (0.2;4.5)	3.7 (3.4;4.1)	5.6 (5.3;5.9)	5.8 (5.5;6.1)	3.9 (3.7;4.1)	2.1 (1.7;2.5)	2.9 (2.5;3.3)	2.0 (1.7;2.3)
Soft drinks	11.3 (10.4;12.1)	10.5 (9.7;11.1)	5.5 (5.1;6.0)	13.6 (13.1;14.1)	11.3 (10.9;11.8)	5.3 (5.0;5.5)	4.6 (4.0;5.1)	3.9 (3.4;4.3)	2.3 (2.0;2.6)
Cereals	5.6 (5.2;6.1)	6.3 (5.7;6.7)	5.3 (4.8;5.7)	4.4 (4.2;4.7)	4.5 (4.3;4.8)	4.9 (4.9;5.2)	1.8 (1.5;2.1)	2.5 (2.2;2.9)	2.8 (2.5;3.1)
Fruit	0.7 (0.5;0.9)	1.0 (0.9;1.2)	1.5 (1.3;1.7)	0.7 (0.6;0.8)	1.0 (0.9;1.2)	1.2 (1.1;1.3)	0.3 (0.2;0.5)	0.7 (0.5;0.9)	0.4 (0.3;0.5)
Sweets	13.4 (12.5;14.2)	16.0 (15.0;16.9)	5.6 (5.2;6.1)	9.0 (8.6;9.5)	8.3 (7.9;8.7)	5.3 (5.0;5.6)	2.9 (2.4;3.3)	3.0 (2.6;3.4)	2.4 (2.1;2.7)
Milk and dairy products	1.5 (1.3;1.7)	1.2 (1.0;1.3)	1.8 (1.6;2.0)	2.8 (2.5;3.0)	0.9 (0.8;1.0)	1.9 (1.7;2.0)	1.2 (0.9;1.4)	0.4 (0.3;0.6)	1.1 (0.9;1.3)
Meals	3.1 (2.7;3.4)	4.7 (4.3;5.1)	9.0 (8.5;9.6)	12.1 (11.7;12.6)	19.8 (19.1;20.5)	21.2 (20.6;21.8)	6.0 (5.3;6.6)	10.6 (9.8;11.4)	13.4 (12.6;14.2)
Fast Foods	6.4 (5.8;7.1)	6.2 (5.6;6.7)	5.7 (5.2;6.1)	8.3 (7.9;8.8)	7.0 (6.6;7.3)	6.8 (6.4;7.1)	2.2 (1.8;2.7)	2.4 (2.0;2.8)	2.1 (1.8;2.4)
Fried and baked snacks	9.6 (8.9;10.2)	8.2 (7.6;8.8)	7.6 (7.2;8.1)	10.0 (9.6;10.4)	7.5 (7.1;7.8)	8.2 (7.8;8.6)	3.4 (3.0;3.9)	3.4 (2.9;3.8)	4.0 (3.6;4.3)

Source: Authors.

Table 4. Evolution of the frequency (%) and 95% confidence interval (95%CI) of acquisition, by food group, for out-of-home consumption, according to monthly per capita income survey year. Brazil, 2002-2003, 2008-2009, 2017-2018.

Food group	1 st Quartile			2 nd Quartile		
	2002-2003 (n=49,237)	2008-2009 (n=49,437)	2017-2018 (n=46,389)	2002-2003 (n=38,183)	2008-2009 (n=42,618)	2017-2018 (n=39,981)
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Alcoholic beverages	4.1 (3.8;4.5)	2.9 (2.6;3.1)	1.6 (1.4;1.7)	5.7 (5.3;6.1)	4.4 (4.1;4.7)	2.5 (2.2;2.7)
Fruit Juices	2.8 (2.5;3.1)	3.3 (3.0;3.6)	3.3 (2.9;3.6)	3.6 (3.3;3.9)	4.5 (4.2;4.9)	2.9 (2.7;3.2)
Soft drinks	6.0 (5.5;6.4)	5.7 (5.3;6.1)	3.6 (3.2;3.9)	10.1 (9.5;10.7)	9.1 (8.5;9.7)	5.0 (4.6;5.4)
Cereals	4.2 (3.9;4.6)	4.6 (4.2;5.0)	4.5 (4.1;4.9)	4.6 (4.3;5.0)	4.9 (4.5;5.3)	4.3 (3.9;4.7)
Fruit	0.6 (0.6;0.8)	1.0 (0.8;1.1)	1.0 (0.8;1.1)	0.6 (0.5;0.8)	0.9 (0.8;1.0)	1.0 (0.9;1.2)
Sweets	8.2 (7.6;8.8)	7.9 (7.4;8.5)	3.6 (3.2;3.9)	9.2 (8.5;9.8)	9.0 (8.5;9.6)	4.1 (3.7;4.4)
Milk and dairy products	1.6 (1.4;1.8)	0.9 (0.7;1.0)	1.7 (1.5;1.9)	1.9 (1.6;2.2)	0.9 (0.8;1.1)	1.6 (1.4;1.8)
Meals	2.7 (2.4;2.9)	5.7 (5.2;6.2)	9.0 (8.5;9.5)	4.9 (4.5;5.3)	9.8 (9.2;10.4)	13.0 (12.4;13.6)
<i>Fast Foods</i>	2.6 (2.3;2.9)	3.2 (2.9;3.5)	2.9 (2.6;3.1)	4.8 (4.3;5.2)	5.1 (4.6;5.5)	4.5 (4.1;4.8)
Fried and baked snacks	6.3 (5.8;6.8)	5.0 (4.6;5.4)	5.5 (5.1;5.8)	8.2 (7.6;8.7)	6.8 (6.4;7.3)	6.8 (6.3;7.2)
Food group	3 rd Quartile			4 th Quartile		
	2002-2003 (n=31,908)	2008-2009 (n=36,723)	2017-2018 (n=36,684)	2002-2003 (n=27,197)	2008-2009 (n=29,404)	2017-2018 (n=31,016)
	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)	% (95%CI)
Alcoholic beverages	6.8 (6.3;7.3)	5.0 (4.6;5.4)	2.7 (2.5;3.0)	8.9 (8.3;9.5)	6.7 (6.1;7.2)	4.2 (3.8;4.6)
Fruit Juices	4.8 (4.3;5.2)	5.0 (4.6;5.4)	3.6 (3.3;3.9)	7.7 (7.0;8.3)	7.4 (6.7;8.1)	4.3 (3.9;4.7)
Soft drinks	14.2 (13.4;15.1)	11.9 (11.2;12.6)	5.1 (4.7;5.5)	18.1 (17.1;19.0)	13.9 (13.1;14.7)	5.6 (5.2;6.0)
Cereals	4.6 (4.2;5.0)	4.7 (4.2;5.1)	4.5 (4.1;4.9)	4.3 (3.8;4.8)	4.4 (3.9;4.8)	5.2 (4.7;5.7)
Fruit	0.7 (0.5;0.8)	1.0 (0.9;1.2)	1.1 (1.0;1.3)	0.6 (0.5;0.8)	1.1 (1.0;1.3)	1.3 (1.1;1.5)
Sweets	9.7 (9.0;10.4)	9.4 (8.7;10.1)	4.5 (4.2;4.9)	10.8 (10.6;11.6)	10.7 (10.0;11.5)	7.2 (6.5;7.9)
Milk and dairy products	2.2 (1.9;2.5)	0.9 (0.8;1.0)	1.6 (1.4;1.8)	3.4 (2.9;3.8)	0.9 (0.8;1.1)	2.1 (1.8;2.3)
Meals	8.8 (8.2;9.3)	15.6 (14.9;16.5)	18.0 (17.3;18.7)	20.6 (19.7;21.6)	30.2 (28.9;31.5)	30.6 (29.6;31.6)
<i>Fast Foods</i>	8.0 (7.3;8.5)	6.5 (6.0;7.0)	6.3 (5.8;6.7)	13.6 (12.7;14.5)	10.0 (9.2;10.8)	6.3 (5.7;6.9)
Fried and baked snacks	10.0 (9.4;10.7)	7.9 (7.4;8.5)	7.4 (7.0;7.9)	12.3 (11.5;13.1)	8.6(7.9;9.4)	9.8(9.0;10.5)

Source: Authors.

Table 5. Mean of expenses with the acquisition, by food group, for out-of-home consumption, according to survey year. Brazil, 2002-2003, 2008-2009, 2017-2018.

Food group	2002-2003	2008-2009	2017-2018	p-value*	p-value**
	% (95%CI)	% (95%CI)	% (95%CI)		
Total	622.8 (593.7;652.0)	879.6 (837.1;922.2)	851.6 (817.1;886.2)	<0.0001	<0.0001
Alcoholic beverages	94.9 (88.3;101.6)	68.6 (64.0;73.2)	47.3 (43.7;51.0)	<0.0001	<0.0001
Fruit Juices	14.8 (13.6;16.0)	19.1 (17.3;20.8)	11.2 (10.3;12.2)	<0.0001	<0.0001
Soft drinks	46.1 (43.7;48.5)	42.5 (40.0;45.2)	15.1 (14.3;16.0)	<0.0001	<0.0001
Cereals	11.2 (9.7;12.7)	12.2 (11.3;13.2)	16.9 (15.1;18.7)	<0.0001	<0.0001
Fruit	2.0 (1.7;2.4)	3.7 (3.0;4.4)	4.5 (4.0;5.0)	<0.0001	<0.0001
Sweets	27.6 (25.2;30.1)	31.7 (28.8;34.5)	25 (22.2;27.8)	0.1116	0.1107
Milk and dairy products	8.5 (7.5;9.5)	2.3 (2.0;2.7)	5.1 (4.5;5.7)	<0.0001	<0.0001
Meals	249.7 (229.4;270.0)	466.7 (435.3;498.1)	527.4 (500.7;554.0)	<0.0001	<0.0001
<i>Fast Foods</i>	69.2 (63.7;74.8)	56 (51.0;61.1)	71.7 (67.4;76.0)	0.3206	<0.0001
Fried and baked snacks	31.3 (29.4;33.2)	36.2 (33.7;38.7)	37.8 (35.7;40.0)	<0.0001	<0.0001

*Linear regression models; **Autoregressive regression model.

Source: Authors.

According to the IBGE¹⁷, the Brazilian urbanization rate has been standing at over 80% since 2010, which attests to a predominantly urban country. The incorporation of urban habits is also observed in the type of food purchased, while the urban area showed a reduction in the acquisition of the fast-food group between 2002-2003 and 2008-2009, maintaining these percentages in 2017-2018. The percentages of these groups remained stable in rural areas.

Expenditures on out-of-home food in the country were higher among individuals of the highest income levels. In 2017-2018, the first results of the Household Budget Survey indicated that the value corresponding to out-of-home eating in the higher income classes was 15.3 times that of lower-income classes, and this difference can be observed in the types of food purchased between different income levels². On the other hand, the declining acquisition percentages over the years are more pronounced among individuals belonging to the highest strata, bringing the frequency of food acquisition for out-of-home consumption closer to extreme income levels.

Concerning the food groups purchased, we observed a reduction in the percentages of purchases in the groups of alcoholic beverages and soft drinks, both for Brazil and urban and rural areas, among all age groups and in all income quartiles, and a decline, in the first surveys, of the acquisition of the fast-food group, which remained in the last HBS. Spending on these items also decreased, especially for soft drinks.

One factor that could explain the reduction found for these food groups is the increase in consumption via delivery, which is not considered out-of-home consumption by IBGE budget surveys. According to Brazilian HBS, the category "out-of-home food" is based on the place of consumption and the entrance of food in the household stock, so food that enters the household, regardless of its source, is considered to be available in the household and, therefore, food inside home. Thus, ready-to-eat foods from restaurants, fast food or other establishments, if consumed at home, are classified as eating indoors¹⁶.

In Latin America, the purchase of food service via delivery has quadrupled in the last five years, standing out for being the second-fastest-growing region in the world. Also, data from this survey indicate Brazil as the country with the highest weekly frequency of food orders for delivery, surpassing even the United States¹⁸. According to the Food Service Brazil Institute, delivery represents around 9% of the food service

sector in the country, and the digital version is a global trend¹⁹. When evaluating the food service by place of consumption, 49% of Brazilians consume outside the place of purchase, placing the order in the "to-go" mode, which allows the consumer to purchase the food prepared outside the home for consumption at home^{19,20}.

Corroborating these findings, the per capita household food availability data from the HBS showed an increase in the household purchase of prepared foods and processed mixtures (56%), alcoholic beverages (19%), and non-alcoholic beverages (17%) in the last three surveys. Non-carbonated sweetened beverages, pizza, lasagna or pastry dough, bread, ice cream, and ready-to-eat meals increased their participation in household availability in both periods, reaching, in 2017-2018, values more than twice as high as those observed in 2002-2003²¹. Canella *et al.*²², when analyzing the relationship between the household availability of industrialized and ultra-processed products and the prevalence of overweight and obesity, using data from the 2008-2009 Household Budget Survey, found that the household availability of ultra-processed products was positively associated with body mass index and the prevalence of overweight and obesity.

The group of meals showed an increase in the frequency of consumption over the years and increased expenses for its acquisition. This elevation was observed in all ages and income groups, except for individuals in the highest quartile. However, they still have a higher frequency of consumption compared to those in the lowest quartile. Income is directly associated with spending on food outside the home, and cooking preparations are responsible for most of the energy consumed outside the home environment^{3,10}.

Eating out-of-home is associated with higher energy intake, higher energy density, high saturated fat content, low fiber content and lower micronutrient intake, thus signaling low nutritional quality^{8,5,23}.

Andrade *et al.*²⁴, analyzing data from the 2008-2009 HBS, when evaluating the association between eating out-of-home and the consumption of ultra-processed foods, found that as the frequency of consumption out-of-home increased, the greater was the contribution of ultra-processed foods, especially sugary drinks and ready meals, and that the consumption of ultra-processed foods was higher when consumption took place out-of-home. Studies indicate that the more frequent the consumption of

food outside the home, the greater the intake of ultra-processed foods^{3,25}.

This habit can interfere with the quality of the diet and influence the health of the individual, as it is a risk factor for the onset of chronic diseases such as hypertension, metabolic syndrome, diabetes mellitus and, in addition, it can be directly associated with excess weight gain²⁶⁻²⁸.

A limitation of our study is the lack of detail regarding what was actually acquired/consumed. The group of meals includes items reported such as lunch and dinner “à la carte” or “self-service”, and lunchboxes, but it is impossible to detail precisely the foods that made up these items. In general, these meals include traditional foods from the Brazilian diet, such as rice and beans, accompanied by some meat, chicken, egg, or fish. Gorgulho *et al.*⁷ observed that the most consumed items at lunchtime were rice, beans, vegetables, soft drinks, and meat. On the other hand, compared to food consumption at home, out-of-home eating increases the consumption of ultra-processed foods and increases total energy intake, with higher consumption of ready meals and sugary drinks and lower micronutrient intake, and is positively associated with changes in body weight and a higher likelihood of developing overweight or obesity^{3,29-31}.

As a result of the modern way of living, with the expanded urbanization, increasingly less time is devoted to performing domestic chores, including preparing meals. Also, technology's practicalities and changes in eating habits sig-

nificantly contribute to greater consumption of out-of-home meals³². Thus, having out-of-home meals has been related to routine work activities, studies, and other commitments¹⁵.

Another limitation of these data refers to the classification of out-of-home eating, which only includes foods prepared and consumed outside the home, that is, foods that were prepared outside and taken home, such as those purchased through delivery or drive-thru, if consumed at home, are included in the household food availability. However, this classification was the same used in all surveys, and the purchase of food prepared outside the home and consumed at home is captured by the analysis of household availability data, which has shown that spending on ready-to-eat foods has increased since 2002-2003³¹.

This study is the first to assess the trend in the acquisition of food for out-of-home consumption over the last 16 years in Brazil, thus providing a first overview of the evolution of this habit in the country.

In general, Brazilians increased food purchases for out-of-home consumption between 2002-2003 and 2008-2009, with a decline in the 2017-2018 period. Income was an essential factor for out-of-home consumption, despite the results showing a reduction in purchases in all socioeconomic strata. The group of alcoholic beverages and soft drinks declined in purchases over the years, while the group of meals grew significantly and was the one with the highest frequency and purchase expense.

Collaborations

BVL Rebouças participated in the analysis and interpretation of data and writing of the manuscript. TM Vasconcelos participated in the analysis and interpretation of data and writing and final review of the manuscript. MHL Sousa contributed with the data analysis. R Sichieri conceived the study and participated in the interpretation of data and final review of the manuscript. IN Bezerra conceived the study, participated in the analysis and interpretation of data, writing and final revision of the manuscript.

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