

Trends in spending on eating away from home in Brazil, 2002-2003 to 2008-2009

Evolução das despesas com alimentação fora do domicílio e influência da renda no Brasil, 2002/2003 a 2008/2009

La evolución de los gastos en alimentación fuera del hogar en Brasil, entre los periodos 2002/2003 y 2008/2009

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Abstract

The study aims to describe trends in food consumption away from home in Brazil from 2002-2003 to 2008-2009 and to analyze the influence of income on this behavior. The authors used data collected by the Household Budget Surveys conducted by the Brazilian Institute of Geography and Statistics (IBGE) in 2002-2003 and 2008-2009. The information analyzed in this study involves records of food and beverage purchases for consumption away from home. Trends in eating away from home were estimated for the total population and according to demographic and economic strata. The association between the share of food consumed away from home and income was studied using regression models to estimate income elasticity coefficients. The share of eating away from home increased 25% during the period, reaching 28% of total spending on food. Each 10% increase in mean per capita income leads to a 3.5% increase in the share of food consumed away from home. This suggests that income growth will result in future increases in the share of eating away from home.

Food Consumption; Nutrition Surveys; Income

Resumo

O objetivo foi descrever a evolução de curto prazo dos gastos com alimentação fora do domicílio no Brasil e analisar a influência da renda sobre essas despesas. Utilizaram-se dados da Pesquisa de Orçamentos Familiares (POF) coletados pelo Instituto Brasileiro de Geografia e Estatística (IBGE) em 2002/2003 e em 2008/2009. A informação analisada compreendeu os registros dos gastos com aquisições de alimentos e bebidas para consumo fora do domicílio. A evolução da participação da alimentação fora do domicílio nos gastos totais com alimentação foi estimada para o conjunto total da população, segundo estratos econômicos e sociodemográficos. Utilizaram-se modelos de regressão para estimação de coeficientes de elasticidade-renda para analisar a relação entre participação da alimentação fora do domicílio e a renda da população. A participação da alimentação fora do domicílio aumentou 25% no período estudado, chegando a 28% dos gastos totais com alimentação. Cada incremento de 10% na renda da população aumentaria em 3,5% dessa participação. Esse cenário sugere que uma evolução favorável da renda acarretará aumentos futuros da participação da alimentação realizada fora do domicílio.

Consumo de Alimentos; Inquéritos Nutricionais; Renda

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Introduction

Patterns of food consumption and physical activity have changed radically in the Brazilian population in recent decades. Along with a reduction in daily physical activity, there has been a trend to replace the consumption of traditional staple foods (such as rice and beans) with ultra-processed products¹. This change relates directly to the increase in prevalence of obesity and chronic non-communicable diseases in the Brazilian population^{2,3}.

The leading factors associated with this change in eating patterns is the increasing habit of having meals away from home^{4,5,6}. Evidence associates the growing rate of food consumption away from home with worsening quality of individual diet^{7,8,9,10}. A comparison of meals or foods served inside and outside the home shows worse nutritional quality of food consumed away from home¹¹, frequently associated with adverse outcomes according to Brazilian and international studies^{12,13,14}.

However, even among developed countries where having meals away from home has already occupied a major role in the diet for several years, few studies have focused on this share of food consumption and its outcomes and determinants. Even the definition of eating away from home is still ambiguous and analyzed in different ways by diet surveys¹⁵. In the United States, eating away from home as a share of total food spending increased from less than 20% in 1970 to 38% in the 1990s¹⁶, while the calorie share of eating away from home leaped from 18% of the total diet in 1977 to 32% in 1995⁴.

In Brazil, data from the individual food consumption survey conducted within the *Household Budgets Survey 2008-2009* (POF) of the Brazilian Institute of Geography and Statistics (IBGE), obtaining two food consumption records in a representative sample of the national population, indicate that one out of four calories consumed by Brazilians already comes from foods and beverages consumed away from home¹⁷. However, such information was not collected in previous editions of the survey, so the study of trends in food consumption away from home in the country can only be done by analyzing the population's spending on eating away from home and not the actual consumption of foods¹⁸.

The share of eating away from home also tends to increase as individual income grows, and the effect of growth in purchasing power is especially important for lower-income individuals^{5,18,19}. This information is particularly relevant considering that a major portion of the world's economic growth in the last decade has occurred

in developing countries like China, Brazil, and Russia, where eating away from home was still not a fully consolidated habit.

The current study aims to describe the trend in spending on eating away from home in Brazil from 2002-2003 to 2008-2009 and evaluate the influence of income on the share of eating away from home in order to analyze future trends in this behavior.

Methods

Sampling

Data collected by the POF survey conducted by IBGE from July 2002 to June 2003 and from May 2008 to May 2009 in a representative probabilistic sample of the country's households served as the basis for this study. The 2002-2003 and 2008-2009 surveys studied 48,470 and 55,970 households, respectively. Both surveys used complex cluster sampling, selecting census tracts in the first stage and households in the second. To select census tracts, the survey performed a prior grouping of the country's tracts in order to obtain geographically and socioeconomically homogeneous household strata. This grouping considered the tracts' location and the resident families' socioeconomic status in producing 443 household strata in 2002-2003 and 550 in 2008-2009. Households in each tract were selected by simple random sampling without replacement. Interviews in the selected households in each stratum were distributed evenly over the course of the four quarters in the duration of the study, to reproduce seasonal variation in income and food purchases in each stratum^{17,20}.

The main information from the POF survey analyzed in this study includes the registry of purchases of foods and beverages for consumption away from home in a notebook, recorded individually by household residents for seven consecutive days. The short reference period used for recording expenditures on eating in each household did not allow detecting the usual food purchase pattern in each of the sampled households. Thus, for this study the reference unit consisted of clusters of households corresponding to the households surveyed in each of the sampling strata from the 2002-2003 and 2008-2009 surveys. This procedure ensures units of study with a wide range of geographic and socioeconomic variation and whose annual food spending pattern can be determined with great precision.

Data analysis

• Creation and definition of study variables

Spending on eating by individuals belonging to the same household (including foods and beverages) was initially added together. Next, spending on eating inside and outside the home was estimated separately.

The total amount of each food or beverage purchased for consumption in the household was converted into energy (kcal) using the *Brazilian Food Composition Table*²¹. For foods not listed in the Brazilian table, the U.S. Department of Agriculture national nutrient database was used²². Household food availability was established by adding the energy values of all the food and beverage purchases made in the same household.

After these procedures, data from households belonging to the same stratum were grouped and then divided by the total number of residents in the stratum in order to express monthly per capita spending and household calorie availability. Eating away from home was then calculated as share of total food spending.

Mean income in the stratum (BRL/per capita/month) was obtained by dividing the sum of all monthly income from all the households in the stratum by the total residents in the stratum, a procedure similar to that used for food spending. Income and spending figures from the 2002-2003 survey were corrected for inflation to make them consistent with those found in the 2008-2009 survey. We also calculated the mean years of schooling for the head of household and the proportion of individuals under five years and over 64 years of age. The stratum's major geographic region (North and Northeast and Central-South) and area (State capital, metropolitan area, other urban areas, or rural area) completed the description of the study units.

• Analytical procedures

We began by examining the variation in the share of spending on eating away from home from 2002-2003 to 2008-2009 for the total population and according to strata consisting of socio-demographic and economic characteristics. Student t-test was used to test the difference between two means for independent samples, to verify the existence of significant differences in the study period.

Using only the 2008-2009 database, we also analyzed the association between the share of eating away from home in total food spending and monthly per capita income, adjusted for

possible confounders (socio-demographic characteristics of the strata). Multivariate linear regression models were used to estimate income elasticity coefficients. Elasticity coefficients indicate the percentage variation in the share of eating away from home as a function of 1% variation in income (income elasticity), adjusted for confounders. The elasticity coefficient corresponds to the regression coefficient (β) of the explanatory variable obtained in the multivariate regression model in which both the dependent variable (share of eating away from home in the stratum) and the independent variable (monthly per capita income in the stratum) underwent log transformation (log-log model). This strategy is often used in food consumption studies^{23,24}. The general model used in the study can thus be described as:

$$\text{Ln}(\% \text{GAfd}) = \alpha + \beta_1 \text{Ln}(R) + \chi_n(\text{VC})$$

where: %GAfd is the share of eating away from home in total food spending, R is monthly per capita income (BRL), and VC are control variables.

For the linear regression model and elasticity, the following were analyzed as potential confounding variables for the association between income and eating away from home: major geographic region and urban/rural area of the stratum; head-of-household's mean schooling; and proportion of children under five years and adults 65 years or older. The final model included only the variables that modified at least 5% of the magnitude of the regression coefficient for spending on eating away from home as a share of income. An extension of the general regression model including the quadratic term for monthly per capita income was tested to identify a possible non-linear relationship between this variable and share of eating away from home in total food spending.

All the study's analytical procedures were performed with Stata 12.1 (Stata Corp., College Station, USA) and took into account the POF weighting factors (IBGE).

Results

The majority of the study population lived in the urban area (some 70%) and in the Central-South region of the country. During the target period there was a significant increase in the population's monthly per capita income, from BRL 763.38 in 2002-2003 to BRL 968.55 in 2008-2009. The same occurred with total monthly per capita food spending (a significant increase from BRL 116.96 to BRL 133.74) (Table 1).

Table 1

Socio-demographic characteristics of study units. Brazil, 2002-2003 and 2008-2009.

Socio-demographic characteristics	2002-2003 (n = 443)	2008-2009 (n = 550)
Monthly per capita income in BRL (standard error)	763.4 (56.8) *	968.5 (47.5) **
Total monthly spending on food in BR\$ (standard error)	116.9 (3.5) *	133.7 (3.7) **
Head-of-family's schooling in years (standard error)	6.7 (0.2)	7.5 (0.1) **
Mean number of residents per household (standard error)	3.6 (0.3)	3.3 (0.2)
Household availability of food [kcal/per capita/day] (standard error)	1,814.7 (33.6)	1,719.6 (28.9)
Area (%)		
State capital	23.1	23.9
Greater metropolitan area ***	12.9	12.8
Other urban areas	48.8	47.7
Rural	15.2	15.6
Region (%)		
Central-South	68.3	67.0
North/Northeast	31.7	32.9

* Values inflated to 2008-2009;

** $p < 0.05$; Student t-test;

*** Not including the State capital's municipality.

From 2002-2003 to 2008-2009, there was a significant increase in the share of eating away from home in total food spending for the Brazilian population as a whole (from 22.2% to 27.9%), concentrated in the middle and upper strata for monthly income and head-of-household's schooling. There was also a significant increase in share of eating away from home in total food spending in all the geographic regions and areas. As expected, in both surveys, the purchase of calories for consumption at the home showed an inverse association with the share of spending on eating away from home (Table 2).

The increase in income was directly associated with spending on eating away from home, even after adjusting for confounding. Each 10% increment in income resulted in a 3.5% increase in the share of eating away from home in total food spending.

Figure 1 showed the predicted values for share of eating away from home in total food spending according to variation in monthly per capita income in 2008-2009. These values are furnished by a regression model that includes a simple term and a quadratic term for family income (both significant at $p < 0.05$), in addition to controlling for socio-demographic variables (area – State capital/metropolitan area, other urban areas, and rural area for the household stratum –, mean number of household residents, proportion of residents ≥ 65 years). Note that income elastic-

ity (responsible for the slope in the figure's trend curve) reaches its peak value (0.63) at the lowest monthly per capita income level (BRL 152.30). As family income increases, income elasticity decreases progressively until approaching zero (0.07) among individuals at the upper extreme of monthly per capita income (BRL 8,248.58). This means an intense increase in the share of eating away from home in total food spending as income increases, especially among lower-income families.

Independent models were tested for the Central-South and North/Northeast regions, but the results did not differ from those for all households in the country (data not shown).

Discussion

The detailed record of food purchases in the 2002-2003 and 2008-2009 surveys showed an increase in eating away from home as a share of total food spending in Brazil. Although this increase was concentrated in the upper-income household strata (higher per capita income and higher head-of-household's schooling), it was present in all regions and areas of the country. Using only data from the most recent survey (2008-2009), there was a direct association between monthly per capita income and share of eating away from home (a 10% increase in mean

Table 2

Trend in spending on eating away from home as share of total food spending, according to population's socio-demographic characteristics. Brazil, 2002-2003 and 2008-2009.

Socio-demographic characteristics	Eating away from home as share of total food spending (%)		
	2002-2003 (A)	2008-2009 (B)	Variation (B-A)
Monthly per capita income (BRL)			
1st tertile	15.9 *	17.3	1.3
2nd tertile	20.1 *	26.8	6.8 **
3rd tertile	28.2 *	34.4	6.2 **
Head-of-family's schooling in complete years			
1st tertile	15.3	15.6	0.3
2nd tertile	20.2	25.2	5.0 **
3rd tertile	28.5	34.9	6.4 **
Household availability of food (kcal/per capita/day)			
1st tertile	24.1	31.5	7.4 **
2nd tertile	21.9	26.9	5.0 **
3rd tertile	17.7	21.5	3.8 **
Area			
State capital	28.1	34.8	6.7 **
Greater metropolitan area ***	22.6	33.6	11.0 **
Other urban areas	20.4	26.8	6.3 **
Rural	12.4	16.1	3.7 **
Region			
Central-South	23.1	31.5	8.4 **
North/Northeast	17.4	20.5	3.1 **
Total	22.2	27.9	5.7 **

* Values inflated to 2008-2009;

** $p < 0.05$; Student t-test;

*** Not including the State capital's municipality.

income would produce a 3.5% increase in eating away from home as a share of total food spending). Although always positive, the effect of income on the share of eating away from home decreased with increasing income.

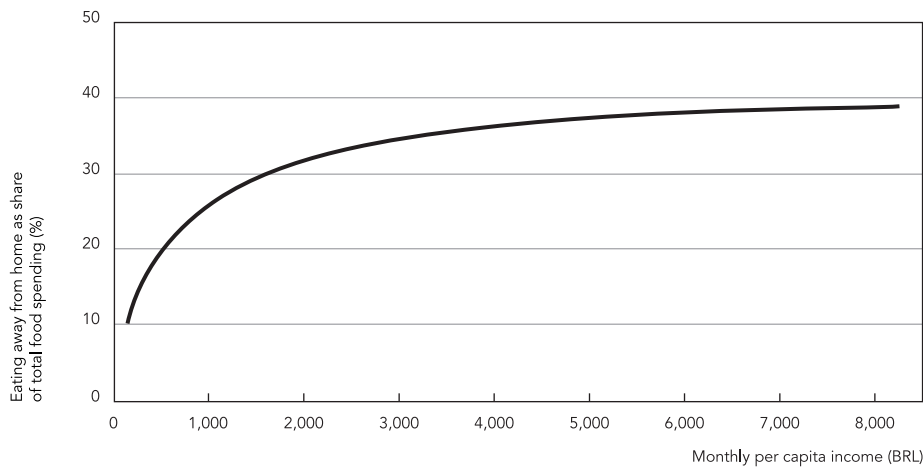
Public concern over the increase in food consumption away from home (as shown in our results) is justified by the reduction in nutritional quality associated with this behavior. Evidence in various countries shows that meals prepared away from home tend to have higher energy density and saturated fat and lower nutritional content than meals prepared at home^{6,5,10,25,26}, so the habit of eating out has frequently been associated with excessive weight gain and has thus been identified as a key factor in the overweight and obesity epidemic in children and adults^{4,8,9,27,28}. The same scenario was found in Brazil in 2008-2009, showing that individuals who reported habitually eating away from home tended to have higher total energy consumption in the diet²⁹. Additionally, increasing size of portions

served at restaurants and fast-food establishments further encourage over-eating^{30,31}. Some studies have shown that the habit of eating away from home is associated with higher consumption of saturated fat, cholesterol, and sodium and lower intake of fiber, calcium, and iron, further highlighting the risks of this behavior for the development of various health problems, such as cardiovascular diseases and certain types of cancer^{8,11}.

The current study extends our knowledge on eating away from home in Brazil by analyzing, for the first time, the short-term trend in this behavior using representative samples of the national population. In addition, the analysis of the association between family income and share of eating away from home provides important information on the future of this behavior in the country, considering the predicted improvement in the population's income in the coming decade³². Furthermore, the statistical control adopted in this analysis (of socio-demographic attributes

Figure 1

Predicted values * for eating away from home as share of total food spending, according to variation in monthly per capita income. Brazil, 2008-2009.



* Estimated with a regression model that controls for socio-demographic variables (area – State capital, greater metropolitan area, other urban areas, and rural area and household stratum – mean number of household residents, proportion of residents ≥ 65 years) and includes a simple and quadratic term for family income.

that could act as confounders or effect modifiers in the association between eating away from home and family income) contribute favorably to the quality of the findings. Still, as in any observational study, one cannot rule out the existence of confounding factors that were not included in our analysis.

Eating away from home occupied a major place in food spending by Brazilian families (nearly one-third of total food spending). Factors that can explain the greater share of spending on eating away from home include the expansion of low-cost restaurants and soup kitchens, which offer subsidized meals to different population groups³³. Brazilians experienced an increase in formal employment and income, and the Workers' Food Program (PAT) nearly doubled the number of participating workers in the last decade³⁴, with a major portion of these workers receiving meal tickets to redeem in participating restaurants. According to data from the Brazilian Food Industry Association (ABIA)³⁵, the market for meals away from home has experienced mean annual growth of more than 10% since 2002. Despite the growing importance of eating away from home, few Brazilian studies have analyzed this question, especially focusing on different places for having meals in public³⁶. The approach to place of food consumption in

studies on nutritional epidemiology gains even more relevance if one considers that in a relatively short period (five years) this phenomenon increased by 25%. In addition, in higher income households and in State capitals (and their metropolitan areas), spending on eating away from home already exceeds 30% of total food expenditures, thus approaching the levels seen in developed countries. This result is consistent with another study using data from the POF survey, showing an increase in spending on eating away from home as a function of ten different income classes, but without adjusting for the socio-demographic characteristics of the families in the strata^{37,38,39,40}.

As observed in similar studies on this theme^{18,41}, income level was closely related to food consumption away from home. Our results confirm this association and also indicate an increase in the discrepancy between extreme income levels, already observed in the 2002-2003 survey¹⁸, since significant increases in the share of eating away from home in that survey were only found in middle and upper-income individuals. This scenario may be explained by the higher direct cost of eating away from home (due to the additional costs in preparing, storing, and marketing the foods), an important impediment to the increase in this behavior in low-income families.

Likewise, the share of eating away from home also tended to be greater in more urbanized areas (State capitals and metropolitan areas). This can be explained by the higher per capita income and the larger supply of restaurants and other eating establishments that facilitate food consumption away from home. It is also common for urban workers to have at least one meal away from home during the workday, due to long and difficult commuting¹⁹.

The current study's main limitation is that the 2002-2003 survey does not allow identifying the amount of food actually consumed (or purchased) away from home. Thus, this study analyzed eating away from home as the share of total food spending and not food consumption per se. Even so, there is no reason to believe that the direction of the associations found by the study would have been different if it had been possible to evaluate the purchase of foods themselves for consumption away from home. Since the share of spending on eating away from home is inversely related to the amount of calories purchased for consumption at home, in both the

2002-2003 and 2008-2009 surveys it is acceptable to believe that spending is a good proxy for the amount of foods actually consumed away from home. Another possible limitation relates to expenditures on foods to be consumed by residents of other households (information included in the POF data of the IBGE). This limitation would tend to be minimal, because the beneficiaries of these expenditures (some 0.33% of the total) are consumption units that belong to the same sampling stratum as the individual that made the purchase (adopted as the study unit here). Due to the great economic and geographic homogeneity of the strata, this hypothesis is highly possible, although it cannot be confirmed.

Finally, the study's results highlight the major growth in eating away from home in Brazil from 2002-2003 to 2008-2009 and the important influence of income on this behavior. This suggests that a favorable trend in income, especially among the poorer strata of the population, will lead to even more intense future increases in the share of eating away from home when compared to the increases observed in this study.

Resumen

El objetivo fue describir la evolución de los gastos en alimentación fuera del hogar en Brasil y analizar la influencia de la renta sobre dichos gastos. Se utilizaron los datos de las Encuestas de Presupuestos Familiares realizadas por el Instituto Brasileño de Geografía y Estadística (IBGE) en 2002-2003 y en 2008-2009. La información analizada comprende los registros de gastos, en relación con las adquisiciones de alimentos y bebidas para consumo fuera del hogar. La evolución del gasto en comida fuera del hogar, en relación con el gasto total en alimentación fue estimada para el conjunto total de la población, según el nivel económico y sociodemográfico.

La asociación entre el gasto en alimentación fuera del domicilio y la renta de la población fue estudiada mediante modelos de regresión, para hallar la estimación de coeficientes de elasticidad-renta. El gasto en alimentación fuera del domicilio aumentó un 25% en el periodo estudiado, llegando a suponer el 28% de los gastos totales en alimentación. Cada incremento del 10% en la renta, la población aumenta un 3,5% el gasto en alimentación fuera del hogar.

Consumo de Alimentos; Encuestas Nutricionales; Renta

Contributors

R. M. Claro and L. G. Baraldi participated in the study conceptualization and design, conducted the data organization and analysis, wrote the initial draft, revised the manuscript, and approved the final version. A. P. B. Martins conducted the data organization and analysis, wrote the initial draft, participated in the revision, and approved the final version. D. H. Bandoni and R. B. Levy participated in the study conceptualization and design and revision of the manuscript and approved the final version.

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