

FOOD AND NUTRITION SURVEILLANCE SYSTEM: FOOD CONSUMPTION OF CHILDREN AGED 2 TO 4 BETWEEN 2018-2022

*SISTEMA DE VIGILÂNCIA ALIMENTAR E NUTRICIONAL: CONSUMO
ALIMENTAR DE CRIANÇAS DE 2 A 4 ANOS ENTRE 2018-2022*

*SISTEMA DE VIGILANCIA ALIMENTARIA Y NUTRICIONAL: CONSUMO
ALIMENTARIO DE NIÑOS DE 2 A 4 AÑOS ENTRE 2018-2022*

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ABSTRACT

The aim of this study was to describe the consumption of ultra-processed foods in children aged 2 to 4 between 2018 and 2022. This is an observational, descriptive study using secondary data from SISVAN. The collection took place from February to March 2023. The study population consisted of 1,067,357 children in Brazil/Northeast/Ceará and São Gonçalo do Amarante. The consumption of ultra-processed foods among children in Brazil in 2021 was 88% and 86% in the Northeast, while it was 83% in Ceará and 81% and 92% and 90% in São Gonçalo do Amarante. Given the huge range of ultra-processed foods that are made available to children in this stage of life, it is important to carry out research, discussions and reflections on Food and Nutrition Surveillance in pre-school, with the aim of implementing public policies or reinforcing those that already exist.

Keywords: *School Feeding; Food insecurity; Food and nutrition surveillance; Industrialized foods.*

RESUMO

O objetivo deste estudo foi descrever o consumo de alimentos ultraprocessados em crianças de 2 a 4 anos entre 2018 a 2022. Trata-se de um estudo observacional, descritivo, de dados secundários, através do SISVAN. A coleta foi realizada de fevereiro a março de 2023. A população do estudo foi composta por 1.067.357 crianças, no Brasil/Nordeste/Ceará e São Gonçalo do Amarante. O consumo de alimentos ultraprocessados em crianças no Brasil em 2021 foi de 88% e 86% no Nordeste, enquanto no Ceará foi de 83% e 81%, e em São Gonçalo do Amarante de 92% e 90%. Em virtude da imensa gama de alimentos ultraprocessados que são disponibilizados para crianças neste ciclo da vida, é relevante que sejam realizadas pesquisas, discussões e reflexões sobre a Vigilância Alimentar e Nutricional na pré-escola, objetivando implementar políticas públicas ou reforçar as que já existem.

Descritores: *Alimentação escolar; Insegurança alimentar; Vigilância alimentar e nutricional; Alimentos industrializados.*

RESUMEN

El objetivo de este estudio fue describir el consumo de alimentos ultraprocesados en niños de 2 a 4 años entre 2018 y 2022. Se trata de un estudio observacional y descriptivo que utiliza datos secundarios del SISVAN. La recogida tuvo lugar de febrero a marzo de 2023. La población de estudio consistió en 1,067,357 niños en Brasil/Nordeste/Ceará y São Gonçalo do Amarante. El consumo de alimentos ultraprocesados entre los niños de Brasil en 2021 fue del 88%, mientras que en el Nordeste fue del 86%, en Ceará del 83% y 81% y en São Gonçalo do Amarante del 92% y 90%. Dada la enorme gama de alimentos ultraprocesados que se ponen a disposición de los niños en esta etapa de la vida, es importante llevar a cabo investigaciones, debates y reflexiones sobre la Vigilancia Alimentaria y Nutricional en preescolar, con el objetivo de implementar políticas públicas o reforzar las que ya existen.

Descriptores: *Alimentación escolar; Inseguridad alimentaria; Vigilancia alimentaria y nutricional; Alimentos industrializado.*

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INTRODUCTION

For a newborn, the ideal and naturally healthy is exclusive breastfeeding until the first 6 (six) months of life. At this stage, this food can meet all nutritional needs¹.

The benefits of breastfeeding go far beyond just preventing malnutrition, as it also improves poor diet due to inadequate food offers that, in the future, can have consequences, such as obesity, *diabetes mellitus*, hypertension, dyslipidemias, and even deaths².

After the 6th month of life, reconciling breast milk, the child is prepared to receive food introduction and accept other naturally healthy foods³.

By introducing appropriate and healthy food choices and habits, the child takes this learning with him throughout his life⁴.

Food and Nutrition Insecurity (FNI) is characterized by the lack or uncertainty of adequate and healthy daily or future food. That is, when the family is unable to provide or when it exists in a limited way, compromising other social access to acquire continuous, adequate and healthy food⁵.

To strengthen food and nutrition security, Brazil has one of the most comprehensive and relevant mechanisms in Latin America, the National School Feeding Program (PNAE), which has become a Public Policy for Food and Nutrition Education with the inclusion of all students in the public school system, from kindergarten to Youth and Adult Education (EJA), which aims to guarantee the Human Right to Food and Adequate Nutrition (DHANA)⁶.

Created in the 90s, the Food and Nutrition Surveillance System (SISVAN) enables and consolidates food and nutrition campaigns in comprehensive health care at all levels, incorporating specific populations and, above all, qualifying all professionals of the Unified Health System (SUS) for Food and Nutrition Surveillance (FNS) activities⁷.

The data from the printed or digital forms of the Food Consumption and Nutritional Monitoring Markers are available in the public domain, serving as support in academic productions and/or implementation of public policies for Food and Nutrition Security (FNS)⁸.

The screening of possible cases of FNI, malnutrition and/or other complications as a result of the non-supply or lack of adequate and continuous food is signaled to health services and other agencies, if necessary, expanding the Health Care Network (RAS)⁹.

According to the Guide for the Evaluation of Food Consumption Markers in Primary Care, there are several questions in the forms, including about the consumption of ultra-processed foods, describing that their consumption should be avoided or done sporadically, due to the high levels of saturated fats, salts and industrialized sweeteners, additives, colorings and flavor enhancers, that stimulate the palate. In addition, the increase in ultra-processed foods in food is caused by low pricing in the market and easy access.^{7,2}

The objective of this study is to describe the consumption of ultra-processed foods in children aged 2 to 4 years, from 2018 to 2022.

METHODS

This is an observational, descriptive, secondary data study, describing the consumption of ultra-processed foods by sex, in the age group of 2 to 4 years, based on secondary information from SISVAN Web and monitored by the Family Health Strategy (FHS), according to the new proposal of the Food Guide for the Brazilian Population⁷.

Data collection was from February to March 2023 and data analysis was completed in April 2023. The study included a population of 1,067,357 children of both sexes in Brazil, in the Northeast region, in the state of Ceará and in the municipality of São Gonçalo do Amarante, between the years 2018 and 2022, without distinction of race or color.

All Food Consumption Markers of children under 2 years of age and children aged 5 years or older, as well as adolescents, adults, pregnant women, and the elderly were excluded from the study.

The form consists of questions referring to the previous day of the survey and for this study only information on the consumption of ultra-processed foods, hamburgers and/or sausages, sweetened beverages, instant noodles, packaged snacks, salty crackers, stuffed cookies, sweets, or sweets were selected⁷.

The descriptive analysis was carried out through exploratory data analysis and presented in the form of a table. R *public domain* software was also used.

The frequencies were calculated for consumption of ultra-processed foods, hamburgers and/or sausages, sweetened beverages, instant noodles, packaged snacks, or salty crackers, filled crackers, sweets or sweets for the territorial divisions: Brazil, Northeast, Ceará and the municipality of São Gonçalo do Amarante.

For all variables, tables, and the means test (t-test) were constructed with the objective of verifying whether the mean between males and females are equal, according to the variables. The level of significance was established as $P < 0.05$.

Due to the research model, the secondary data involved are in the public domain referring to official information systems of the Ministry of Health (MH), without identification of the participating subjects and it is not necessary to undergo submission and approval by the National Research Ethics Committee (CONEP), according to Resolution No. 466/2012, which involves human beings¹¹.

RESULTS

Data on food consumption were analyzed in 1,067,357 children monitored by the Family Health Teams, of which 546,274 (51.18%) were male and 521,083 (48.81%) females, between the years 2018 and 2022, in Brazil, Northeast, Ceará and São Gonçalo do Amarante, municipality of Ceará.

Table 1 shows the relationship between the consumption of ultra-processed foods, in which a high consumption was found in all the regions surveyed, both for boys and girls.

In the period from 2018 to 2022, with a total of 546,274 boys and 521,083 girls, the maximum consumption for boys and girls in 2021 was 88% in Brazil. In the Northeast, with a population of 165,944 boys and 159,722 girls, the maximum percentage of consumption of ultra-processed foods for boys and girls was obtained in 2021 (86%). In

Ceará, with 29,494 boys and 28,133 girls, the percentage of maximum consumption of ultra-processed foods was 87% for boys in 2018 and 87% for girls in 2019. In São Gonçalo do Amarante, the total of 1,004 children monitored by the Family Health Teams with 501 boys and 503 girls, obtained the maximum consumption of ultra-processed foods for boys in 2018 (98%) and girls in 2021 (92%). It should be noted that, during the year 2020, in São Gonçalo do Amarante, monitoring was not carried out by the Family Health Team in all surveys, due to the second wave of Covid-19, therefore, no data were recorded in SISVAN Web. All data are described in Table 1.

Table 1 - Frequency of consumption of ultra-processed foods, during the period from 2018 to 2022, according to sex, Brazil/ Northeast/ Ceará and São Gonçalo do Amarante.

Brazil	Female %	Male %
Year		
2018	84	84
2019	83	83
2020	83	83
2021	88	88
2022	83	83
Northeast	Female	Male
2018	85	85
2019	84	84
2020	82	83
2021	86	86
2022	82	82
Ceará	Female	Male
2018	86	87
2019	87	86
2020	82	81
2021	83	81
2022	82	83
São Gonçalo do Amarante – Ceará	Female	Male
2018	74	98
2019	86	90
2020		
2021	92	90
2022	82	83

Source: Prepared by the authors; SISVAN, 202212; Mean percentage of variables according to the child's sex, 2018-2022 and mean test to verify the equality of the means. Female 83.55% Male 90.04% - p-value: 0.2303.

Table 2 shows the maximum food consumption of hamburgers and/or sausages in Brazil for boys and girls in 2021 (51%). In the Northeast, the maximum consumption for boys and girls was in 2021 (50%). In Ceará, the maximum consumption was in 2021 for boys (46%) and girls (47%) and in São Gonçalo do Amarante, the maximum consumption was also obtained in 2021 for boys and girls (65%).

Table 2 - Frequency of consumption of hamburgers and/or sausages, during the period from 2018 to 2022, according to sex, Brazil/ Northeast/ Ceará and São Gonçalo do Amarante.

Brazil	Female %	Male %
Ano		
2018	34	35
2019	34	35
2020	35	36
2021	51	51
2022	37	38
Northeast	Female	Male
2018	35	35
2019	35	36
2020	33	34
2021	50	50
2022	38	39
Ceará	Female	Male
2018	39	41
2019	43	44
2020	34	35
2021	47	46
2022	41	43
São Gonçalo do Amarante - Ceará	Female	Male
2018	41	48
2019	60	49
2020		
2021	65	65
2022	43	47

Source: Prepared by the authors; SISVAN, 202212; Mean percentage of variables according to the child's sex, 2018-2022 and mean test to verify the equality of the means. Female 52.30% Male 52.24% - p-value: 0.9441.

Table 3 describes indicators referring to the descriptive analysis of the consumption of sweetened beverages in Brazil, with the maximum percentage in the years 2018/2020/2021 for boys (64%) and for girls in 2021 (65%). In the Northeast, the maximum consumption for boys was in 2018/2019 (62%) and girls (61%). In Ceará, the maximum consumption for boys was in 2018 (65%) and for girls in 2019 (64%). In São Gonçalo do Amarante, the maximum consumption was in 2019 for boys (63%) and girls (71%).

Table 3 - Frequency of consumption of sweetened beverages, during the period from 2018 to 2022, according to sex, Brazil/ Northeast/ Ceará and São Gonçalo do Amarante.

Brazil	Female %	Male %
Ano		
2018	63	64
2019	63	63
2020	63	64
2021	65	64
2022	62	62
Northeast	Female	Male
2018	61	62
2019	61	62

2020	59	61
2021	60	60
2022	59	59
Ceará	Female	Male
2018	63	65
2019	64	64
2020	58	57
2021	57	56
2022	60	61
São Gonçalo do Amarante - Ceará	Female	Male
2018	41	55
2019	71	63
2020		
2021	52	59
2022	62	60

Source: Prepared by the authors; SISVAN, 2022¹²; Mean percentage of variables according to the child's sex, 2018-2022 and mean test to verify the equality of the means. Female 56.72% Male 59.19% p-value: 0.7385.

Table 4 shows the consumption of instant noodles, packaged snacks or salty crackers in Brazil with the maximum consumption in 2022 (49%) for boys and girls. In the Northeast, the maximum was in 2018/2022 (52%) for boys and in 2018 for girls (53%). In Ceará, the maximum consumption was in 2019 for boys (54%) and girls (55%). In comparison, São Gonçalo do Amarante obtained the maximum in 2018 for boys (59%) and in 2019 for girls (57%).

Table 4 - Frequency of consumption of instant noodles, packaged snacks or salty crackers, during the period from 2018 to 2022, according to sex, Brazil/ Northeast/ Ceará and São Gonçalo do Amarante.

Brazil	Female %	Male %
Ano		
2018	48	48
2019	48	48
2020	47	48
2021	45	45
2022	49	49
Northeast	Female	Male
2018	53	52
2019	51	51
2020	49	50
2021	47	47
2022	52	52
Ceará	Female	Male
2018	53	53
2019	55	54
2020	50	51
2021	47	46
2022	52	52
São Gonçalo do Amarante - Ceará	Female	Male
2018	49	59
2019	57	49

2020		
2021	45	41
2022	44	48

Source: Prepared by the authors; SISVAN, 202212; Mean percentage of variables according to the child's sex, 2018-2022 and mean test to verify the equality of the means. Female 48.61%; Male 49.19% - p-value: 0.9083.

Table 5 addresses the consumption of filled cookies, sweets, and sweets. In Brazil, the maximum consumption was found in the years 2018/2021 for boys (60%) and girls in the years 2018/2022 (60%). In the Northeast, the maximum consumption in 2018 was for boys (60%) and girls (61%). In Ceará, the maximum in 2018 for boys (62%) and girls (63%). In São Gonçalo do Amarante, the maximum consumption was in 2018 for boys (89%) and for girls in 2019 (74%).

Table 5 - Frequency of consumption of filled cookies, sweets and sweets, during the period from 2018 to 2022, according to sex, Brazil/ Northeast/ Ceará and São Gonçalo do Amarante.

Brazil	Female %	Male %
Ano		
2018	60	60
2019	59	59
2020	59	59
2021	60	60
2022	60	59
Northeast	Female	Male
2018	61	60
2019	58	58
2020	57	57
2021	58	58
2022	58	58
Ceará	Female	Male
2018	63	62
2019	59	59
2020	59	58
2021	56	54
2022	60	60
São Gonçalo do Amarante - Ceará	Female	Male
2018	41	55
2019	71	63
2020		
2021	52	59
2022	62	60

Source: Prepared by the authors; SISVAN, 202212; Mean percentage of variables according to the child's sex, 2018-2022 and mean test to verify the equality of the averages Female 62.74% Male 72.49% - p-value: 0.2742.

DISCUSSION

From the data collection, it is possible to observe a high consumption of ultra-processed foods and their derivatives among children aged 2 to 4 years in all regions surveyed, including São Gonçalo do Amarante, municipality of Ceará.

It is understandable that the child demands specific needs for its development and adequate growth, and to meet these needs, numerous health care for the mother and baby

are necessary. One of the guidelines for parturients is the offer of exclusive breast milk until the 6th month of the child's life, in which studies reveal numerous benefits in the child's health and development, in addition to the formation of affective, emotional, and social bonds¹³.

The introduction of food to the infant after the 6th month of life is necessary, but in a correct and adequate way, understanding that it is a delicate phase, which seeks to prevent the child's nutritional impairment, avoiding weight loss, increasing growth and protecting from possible pathologies and food allergies¹⁴.

And parents, caregivers and family members need to understand that this care with the introduction of adequate and healthy food is extremely relevant, especially at this stage of life⁴.

In this context, ultra-processed foods offered and ingested by children can cause low immunity, influence the appearance of allergies, possible reduction in digestion and absorption of nutrients, in addition to having probable consequences in other stages necessary for development, which may have repercussions in old age¹⁵. It is understood that there is a need for more specific studies to identify damage to children's health.

In an academic article by Pete Wilde (2024), published in *The Conversation* newspaper and entitled "*What the largest review of studies on ultra-processed foods has revealed*", one in five deaths occur due to poor food intake, including early deaths due to acquired Chronic Non-Communicable Diseases (NCDs) and that ultra-processed foods become an aggravating factor for the health of the population, due to the enhanced flavor, texture, price and easy access, also warning that the unbridled consumption of soft drinks and breakfast cereals may result in 32 harmful effects on health, including problems related to mental health. It should be noted that these products have a low nutritional value in terms of fiber, vitamins, minerals, essential antioxidants, and a high content of saturated fats, salt, sugars, additives, and other chemical substances that are not revealed¹⁶.

In relation to the study carried out between 2018 and 2022, the similarity of the high consumption of ultra-processed foods is notorious, presenting an alert for a stage of life in which it is essential to eat and learn an adequate and healthy diet, understanding that this influence may also affect other stages of life, according to studies.

The Brazilian population increased the intake of ultra-processed products and fast foods, reduced the consumption of "basic" foods *in natura* and cereals, such as rice and beans. In addition, the intake of fruits, vegetables, legumes and water consumption is restricted. These changes in diet negatively affect the health of the population, a critical scenario perceived in health statistics with high rates in cases of NCDs, also affecting children, considering that the encouragement and support for healthy eating habits during childhood remain in the child's cognitive throughout life, including in adulthood¹⁷.

The Food Guide for the Brazilian Population, published in 2006 and reprinted in 2014, is a Federal Government strategy to stimulate healthy food consumption.

The Guide is composed of guidelines for the promotion of adequate and healthy food education, incorporating the National Food and Nutrition Policy (PNAN). It also has numerous informative data and guidance on food, focusing on health promotion, healthy and sustainable eating practices in a specific and/or collective way¹⁸ and providing a parameter for professionals and the Brazilian population. There is also the Food Guide

for children under 2 years of age, which encourages exclusive breastfeeding until six months of age and the introduction of food in an appropriate way, in order to meet all the nutritional needs of the child⁹.

In this context, all emerging and developing countries, including Brazil, are moving towards changes in the model of the health-disease process, which can be influenced by their eating habits. These changes directly influence the population, their consumption practices and food choices¹⁹.

Understanding that parents' preference for the preparation of the child's daily diet is directly linked to knowledge arising from family customs that pass from generation to generation, sociocultural influence, purchasing power and media influences²⁰, this study clearly demonstrates this change in children's diet with high percentages of consumption of processed foods.

According to data from the Brazilian Research Network on Food and Nutritional Sovereignty and Security (PENSSAN) and the 2nd National Survey on Food Insecurity in the Context of the Covid-19 Pandemic in Brazil in 2020, it was revealed that 33.1 million people are hungry in Brazil, disclosing that Brazil has regressed to rates similar to the 1990s. In a sample of 10 families, only 4 of them are able to eat 6 meals a day with access to food and no future concerns²¹.

Food and Nutrition Insecurity occurs when there is nothing to eat, with a lack and/or uncertainty today or the next day, also compromising social rights, due to food⁵.

The Ministry of Health (MS), through the Josué de Castro Institute (IJC) and the Federal University of Rio de Janeiro (UFRJ), carried out the National Study of Child Food and Nutrition (ENANI) - 2019/2020, a survey with 14,558 children aged 0 to 5 years in 26 Brazilian states, applying a questionnaire at home with a focus on analyzing breastfeeding and feeding practices among Brazilian children under 5 years old. The consumption of ultra-processed foods was identified among children aged 6 to 23 months (80.5%) and children aged 24 to 59 months (93.0%)².

In line with the data found in this study, among children aged 2 to 4 years, the rates for the intake of ultra-processed foods were also significant and high in all the locations surveyed (Brazil, Northeast, Ceará and São Gonçalo do Amarante).

In the ENANI survey, the consumption of sweetened beverages was also revealed among children aged 6 to 23 months (24.5%) and children aged 24 to 59 months (50.3%)².

Compared to the study carried out through SISVAN Web, during the years 2018 to 2022, the consumption of sweetened beverages among children aged 2 to 4 years was also high in almost all locations surveyed, with a reduction only in 2018 for girls (41%) in São Gonçalo do Amarante, which makes this fact worrying.

Another study carried out through the Continuous National Household Sample Survey (PNAD), in conjunction with the Brazilian Institute of Geography and Statistics (IBGE) and the Ministry of Development and Social Assistance, Family and Fight against Hunger (MDS), which was based on the Brazilian Food Insecurity Scale (EBIA), revealed that, in the last quarter of 2023, 21.6 million households in Brazil were identified affected with some degree of food insecurity, reporting that about 3.2 million households live without any food prospects. The North and Northeast regions had the lowest proportions of households with food security, indicating a great concern or uncertainty in maintaining

access to food in quantity and continuous quality, impairing food intake and family sustenance²².

We understand that ultra-processed foods and their derivatives, due to their low cost, practicality, easy access, enhanced flavor, and influence of social media, have a strong influence on the eating routine of the Brazilian population, significantly affecting the quality and nutritional support, especially for children.

According to the Institute of Research and Economic Strategy of Ceará (IPECE), comparing Brazil, the Northeast and Ceará, there was a significant drop in Food and Nutritional Security in households in the last five (5) years, emphasizing that, before the Covid-19 pandemic, this decline had already begun. Although the state is one of the major producers and exporters of food, Ceará was the eighth in Brazil in severe Food and Nutrition Insecurity with about 26.3% during the pandemic²³.

FINAL CONSIDERATIONS

According to the study, there was a high consumption of ultra-processed foods, such as sweetened beverages, filled cookies, sweets and snacks, instant noodles, packaged snacks and salty crackers, among boys and girls in the age group of 2 to 4 years, in all regions surveyed.

In view of the changes in the health-disease process, observing a growth in the food intake of ultra-processed foods every year, the influence on these bad eating habits and that, consequently, will increase the occurrence of Chronic Non-Communicable Diseases, it is relevant to bring a theme like this, to be discussed more frequently, responsibly and knowledgeably by the academic world, bringing reflections on the Food Insecurity that has been affecting our children and the importance of the role of Food and Nutrition Surveillance, especially in the preschool period. This is a phase that has as its pillar playfulness, the awakening of knowledge, the sharpening of curiosity and learning, which will follow the course of life.

The potential of this information acquired in this study may help health professionals, researchers and students with data that were acquired through a simple, easy-to-understand and practical instrument, which are the Food Consumption Markers by SISVAN.

Aware that more studies are needed on this vast topic, in order to alert everyone about care with regard to Food and Nutrition Insecurity in the preschool period.

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