REVISTA DE NUTRIÇÃO
Brazilian Journal of Nutrition

ORIGINAL ARTICLE

Public Policies for Food and Nutrition

Editors
Luciana Nucci, Francisco de Assis Guedes de Vasconcelos

Data Availability
The research data are available within the body of the document.

Conflict of interest
The authors declare that there are no conflicts of interest.

Received
May 15, 2025

Final version
March 10, 2026

Approved
April 27, 2026

Profile of foods described in public calls by the cities of São Paulo state during the COVID-19 pandemic and after updating the school feeding legislation

Perfil dos alimentos descritos em chamadas públicas paulistas durante a pandemia da COVID-19 e pós atualização da legislação da alimentação escolar

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How to cite this article: Santos DS, Neves JA, Bandoni DH, Amorim ALB. Profile of foods described in public calls by the cities of São Paulo state during the COVID-19 pandemic and after updating the school feeding legislation. Rev Nutr. 2026;39:e15520. https://doi.org/10.1590/1678-9865202639e15520

ABSTRACT

Objective

To describe the profile of foods listed in public calls for the acquisition of products from family farming

destined for the Brazilian National School Feeding Program (PNAE) in municipalities of the state of São Paulo, during the COVID-19 pandemic and after the update of school feeding legislation.

Methods

This is a descriptive cross-sectional study that analyzed public calls published in 2021 on the Codeagro website. Foods were classified according to NOVA, and fresh and minimally processed foods were subdivided into cereals; roots and tubers; fruits, vegetables, and greens; legumes; milk and dairy products; and meat and eggs. Municipalities were grouped into quartiles according to the number of students enrolled in the public school system, enabling comparisons according to municipal size. The chi-square test was used to verify the association between the number of students and the presence of food groups in the public calls (p<0.05).

Results

A total of 236 public calls from 191 municipalities in São Paulo were evaluated. Fruits (90.05%), vegetables (83.25%), and roots and tubers (82.20%) were the most prevalent groups in all municipalities, with higher frequencies in smaller municipalities (p<0.001), as was also observed

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for legumes. In contrast, powdered milk (20.83%), fruit juice (31.25%), processed/ultra-processed foods (22.92%), and cereals (20.83%) were more frequently present in the calls from municipalities with a larger number of students (p<0.001). All the calls analyzed included unprocessed foods.

Conclusion
The results highlight the role of family farming in promoting healthy and adequate eating, grounded in a sustainable food system. The importance of complying with current legislation to prioritize local production and strengthen short supply chains is highlighted.

Keywords: Agriculture. COVID-19. Nutrition policy. School Feeding.

RESUMO

Objetivo
Descrever o perfil dos alimentos presentes nas chamadas públicas para aquisição de produtos da agricultura familiar destinados ao PNAE em municípios do estado de São Paulo, durante a pandemia da COVID-19 e pós atualização da legislação da alimentação escolar.

Métodos
Trata-se de um estudo transversal descritivo que analisou chamadas públicas em 2021 no site da Codeagro. Os alimentos foram classificados conforme a NOVA, sendo os in natura e minimamente processados subdivididos em: cereais, raízes e tubérculos; frutas, legumes e verduras; leguminosas; leite e derivados; carnes e ovos. Os municípios foram agrupados em quartis de acordo com o número de escolares matriculados na rede pública de ensino, permitindo a análise dos alimentos segundo o porte municipal. Utilizou-se o teste do qui-quadrado para verificar a associação entre o número de alunos e a presença dos grupos alimentares nas chamadas públicas (p<0,05).

Resultados
Foram avaliadas 236 chamadas públicas de 191 municípios. Frutas (90,05%), hortaliças (83,25%), raízes e tubérculos (82,20%) foram os grupos mais prevalentes em todos os municípios, com maior frequência nos de menor porte (p<0,001), o mesmo ocorrendo com as leguminosas. Em contrapartida, leite em pó (20,83%), suco de frutas (31,25%), alimentos processados/ultraprocessados (22,92%) e cereais (20,83%) apresentaram maior presença nas chamadas dos municípios com mais estudantes (p<0,001). Todos os editais analisados incluíram alimentos in natura.

Conclusão
Os resultados reforçam o papel da agricultura familiar na promoção de uma alimentação saudável e adequada, fundamentada em um sistema alimentar sustentável. Destaca-se a importância do cumprimento da legislação vigente para priorizar a produção local e fortalecer circuitos curtos de comercialização.

Palavras-chave: *Agricultura. COVID-19. Política nutricional. Alimentação escolar.*

INTRODUCTION

The *Programa Nacional de Alimentação Escolar* (PNAE, National School Feeding Program) is one of the largest and most successful education policies interfacing with food security and health promotion [1]. The program's objective is to "contribute to the biopsychosocial growth and development, learning, school performance, and the formation of healthy eating habits of students, through food and nutrition education actions and the provision of meals that meet their nutritional needs during the school year" (Art. 4º, our translation) [2].

The PNAE is a universal policy that offers meals to all students in public basic education. Among the numerous innovations, the procurement of food from Family Farming (FF) stands out, with a requirement to use at least 30% of federal financial resources for the acquisition of food supplies directly from the family farmer and/or family entrepreneur [3]

The procurement of these foods is considered an important reference for supporting sustainable local development, as it encourages the acquisition of diversified food items produced locally, stimulating regional and healthy eating habits [4]. However, studies by the Institute for

Applied Economic Research, conducted with data from 2017, found positive and significant effects on the average income increase of farmers, which can vary from 23 to 106% for those who supply food to the PNAE [5]. Additionally, a significant and positive correlation was identified between family farming purchases and the performance of elementary school students in the Basic Education Assessment System tests, conducted in 2013 and 2019 [6].

To foster the procurement of these food products for School Feeding (SF) and considering the difficulties reported by Executing Entities and family farmers in the purchasing/selling process, the Federal Government has been publishing normative acts since 2009 to foster intersectoral coordination and achieve effective targets for resources transferred by the *Fundo Nacional de Desenvolvimento da Educação* (FNDE, National Education Development Fund) for family farming procurement. Among the most recent legal amendments, the regulations issued by the FNDE Deliberative Council (DC) stand out: Resolution DC/FNDE No 8, 2020, which introduced, among other changes, amendments to the FF procurement process – notably penalties for Executing Entities that fail to meet the 30% family farming procurement threshold, and revised criteria for the selection of sales projects [3]; Resolution DC/FNDE No. 21 of Nov 16, 2020, which amended the maximum sales limit per family farmer [7]; Resolution DC/FNDE No. 03 of Feb 4, 2025, which included women among priority groups, alongside agrarian reform settlements and traditional indigenous and *quilombola* communities [8]; on Sep 30, 2025, Law No. 15.226 was enacted, raising the minimum percentage of PNAE resources allocated to family farming procurement to 45%, effective 2026 [9]. On Feb 18, 2026, the per capita resource was expanded for all levels of education, with an increase of 14.35%, a measure that is expected to benefit both students and family farmers [10].

However, despite the normative advances observed over the years – with the strengthening of legal mechanisms aimed at expanding and improving family farming procurement within the PNAE – the sanitary and social context imposed by the Coronavirus Disease 2019 (COVID-19) pandemic represented an inflection point in this trajectory. The emergency measures adopted to ensure the continuity of food provision to students required operational readjustments within the Program, directly impacting the dynamics of food supply procurement from family farming [11,12].

Thus, considering the changes in family farming procurement procedures associated with the pandemic period, this study aimed to describe the profile of food items listed in public calls for the procurement of family farming products for the PNAE in municipalities of São Paulo during the COVID-19 pandemic and following the update of school feeding legislation.

METHODS

This cross-sectional study evaluated all Public Calls (PC) published in 2021 on the website of the *Coordenadoria de DeseDecronegócios* (Codeagro, Agribusiness Development Coordination) of the Secretariat of Agriculture and Supply of the state of São Paulo (https://codeagro.agricultura.sp.gov.br/home). This portal concentrates all public calls in the state, allowing access to both active and closed PC. This enabled the identification of public calls between Jan and Dec 2021. Notably, Resolution DC/FNDE No. 06/2020 establishes that public calls for school feeding must be published on the official municipal government website, in a local circulation newspaper, and as a wall notice in a public place with wide circulation [3].

The FNDE stipulates that public calls must provide sufficient information for suppliers to correctly submit their sales projects. Information such as the types of products and quantities to be supplied, the delivery schedule and locations (frequency, start and end of supply, among

others), pricing, and criteria for the selection of sales projects must be mandatorily included in said document [3,13]. Considering these requirements, public calls were classified as "with description" or "without description", according to the presence or absence of food item descriptions regarding their characteristics, quality, degree of maturity, and size.

The number of public calls published by each municipality during the study period and the total number of food items requested were quantified. Municipalities that published more than one public call had their information consolidated, with the presence of information prevailing if reported in at least one PC.

To establish the frequency with which food items appeared in the public calls, varieties of the same food were grouped into a single subgroup (e.g., Cavendish and Manzano bananas were grouped as "banana" in the public calls in which they appeared). Food items were classified according to the 2014 Dietary Guidelines for the Brazilian Population [14]. Unprocessed and minimally processed foods were subclassified into cereals, roots, tubers, fruits, vegetables, greens, legumes, milk and dairy products, and meat and egg products. The presence of at least one food item belonging to a given group was considered a sufficient criterion for classifying that group as present, regardless of the observed frequency. The presence of regional foods and organic and/or agroecological foods was also investigated.

A search was conducted in the Public Access Accountability Management System (SiGPC) to verify the percentage of family farming procurement declared by the Executing Entities in 2021 [15]. Based on this information, the municipalities were classified as follows: did not purchase from family farming, purchased between 0 and 30%, and purchased more than 30%.Municipalities were grouped into quartiles according to the number of students enrolled in the public basic education network, as reported in the 2020 School Census. This grouping allowed for the assessment of food items listed in public calls in relation to municipality size.

The results are described using frequency measures. Pearson's chi-square test was used to assess the association between the food profile of public calls (dependent variable), grouped into categories (cereals, legumes, roots and tubers, fruits, meats, eggs, powdered milk, fruit juices, processed/ultra-processed foods, and culinary ingredients), and municipality population size, categorized into quartiles (independent variable). The software used was IBM®SPSS® version 17.0, and a significance level of $p<0.05$ was adopted for all tests.

RESULTS

We evaluated 236 public calls from 191 São Paulo municipalities published between Jan and Dec 2021. The maximum number of publications per municipality was eight (n=1, 0.52%), and six PC (n=1, 0.52%), followed by five (n=2, 1.04%), three (n=2, 1.04%), and two (n=20, 10.47%) PC, and the majority published a single public call during the analyzed period.

The PC were published mainly in May, January, April, September, and October (in that order). Table 1 presents the characteristics of public calls. Only 61 municipalities (31.94%) used the current legislation as a reference [3]. Corroborating this disagreement with the legislation, only 75 (39.27%) described using the correct selection criteria for sales projects based on location (local, immediate region, intermediate region, state, national); the remaining municipalities described the criteria present in Resolution DC/FNDE No. 26/2013 (n=91, 47.64%) or did not mention what the criteria would be (n=25, 13.09%).

Most PC provided descriptions of the characteristics and qualitative specifications of the food items (n=177; 92.67%). It was also observed that 81.15% (n=155) contained a previously defined delivery schedule, and 90.05% (n=172) specified the location designated for product delivery. Regarding this latter aspect, it was found that among those providing the delivery location, the request for delivery at a single point in the municipality predominated (n=99; 51.83%). The provision for food item substitution was identified in only four municipalities (2.09%).

The PNAE encourages the procurement of organic, socio-biodiversity, and regional food. However, the purchase of organic foods was planned by only 36 municipalities (18.85%), with nine of them defining which organic foods were to be acquired. Socio-biodiversity foods were planned by 137 municipalities (71.73%), and regional foods were planned by 155 (81.15%).

The ten foods that appeared most frequently in the public calls were, in this order: lettuce (62.3%), banana (64.4%), cabbage (58.0%), carrot (56.7%), beet (56.3%), collard greens (55.0%),

Table 1 – Characterization of public calls published by 191 municipalities. State of São Paulo, 2021.

Characterization of Public Calls (n=191)	n	%
Referenced Legislation		
Resolution 06 and/or 20/2020	61	31.94
Resolution 26/13 and 04/15	91	47.64
Resolutions 06, 26, and 04	32	16.75
None cited	1	0.52
Other legislation cited	6	3.14
Selection Criteria by Location		
Local, rural territory, state, national	91	47.64
Local, immediate/intermediate region, state, national	75	39.27
Not specified	25	13.09
Description of food characteristics		
Yes	177	92.67
No	14	7.33
Presence of organic foods		
Yes	9	4.71
No	182	95.29
Provision for organic food procurement		
Yes	36	18.85
No	155	81.15
Provision for substitution		
Yes	4	2.09
No	187	97.91
Presence of a delivery schedule		
Yes	155	81.15
No	36	18.85
Delivery modality		
Unspecified	19	9.95
Point-to-point	73	38.22
Single delivery point	99	51.83
Presence of regional foods		
Yes	155	81.15
No	36	18.85
Presence of sociobiodiversity foods		
Yes	137	71.73
No	54	28.27
Description of food pricing		
Yes	189	98.95
No	2	1.05

cassava (55.35%), tomato (54.6%), chayote (48.7%), and cucumber (48.7%). There was a predominance of leafy greens and tubers, and the only fruit that appeared was banana. Conversely, the foods that appeared in only one public call were: granulated sugar, coconut water, rosemary, plum, atemoya, crystallized banana, *bisnaguinha* bread rolls, homemade cake, starfruit, cherry, *chipa* (small, baked, cheese-flavored rolls), artisanal sweets, tomato paste, black-eyed peas, fig, *jaboticaba* berry, scarlet eggplant, kiwi, UHT milk, bay leaf, mozzarella, macadamia nut, oregano, *ora-pro-nobis*, garlic paste, coffee powder, *rapadura* (unrefined cane sugar), and vegetable medley.

A total of 130 different food types were described, with 79.23% (n=103) belonging to the fresh and minimally processed groups, 10.77% (n=14) ultra-processed, 7.69% (n=10) processed, and 2.31% culinary ingredients (n=3). Notably, all municipalities described the presence of at least one fresh food item in their PC.

Figure 1 describes how family farming procurement occurred in 2021, based on the search in the Public Access SiGPC. Only 23.56% of the municipalities (n=45) complied with the legal requirement; furthermore, a portion of the municipalities did not acquire any type of food from FF in the aforementioned year, and the majority did not reach the recommended target.

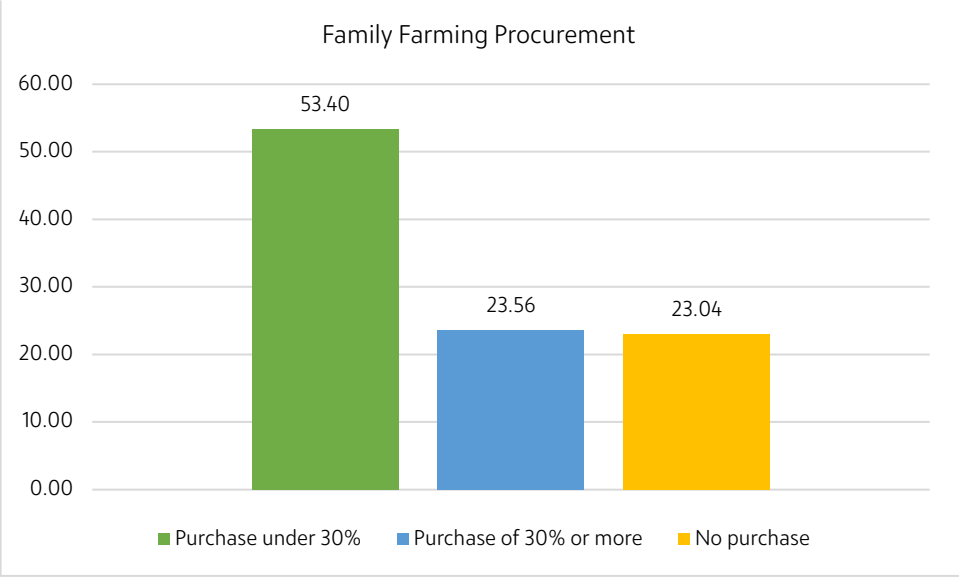


Figure 1 – Family Farming procurement in the year 2021. State of São Paulo, 2021.

Table 2 presents the association between the quartiles of the number of students and food groups. The groups of fruits, leafy greens, roots, and tubers were the most prevalent, generally across all municipalities; however, they were more frequently described in smaller cities (p<0.001), a trend also observed with legumes. On the other hand, powdered milk, fruit juice, processed/ultra-processed foods (p<0,005), and cereals (p<0.001) were identified with a greater presence in the public calls of the largest municipalities.

All municipalities in the first quartile described fruits and leafy greens in their public calls. This was also observed for fruits in the municipalities of the second and third quartiles. It is noteworthy that 32 municipalities (16.75%) did not describe the intention to purchase leafy greens, and 19 (9.94%) did not include fruits, with the majority of these being large-scale municipalities

Table 2 – Food profile of public calls according to municipality size. State of São Paulo, 2021.

Food Group	Quartile 1 (n=47)		Quartile 2 (n=48)		Quartile 3 (n=48)		Quartile 4 (n=48)		Total	
	n	%	n	%	n	%	n	%	n	%
Cereals**	2	4.26	2	4.17	2	4.17	10	20.83	16	8.38
Legumes**	34	72.34	23	47.92	24	50.00	12	25.00	93	48.69
Roots and Tubers**	45	95.74	46	95.83	39	81.25	27	56.25	157	82.20
Leafy greens**	47	100.00	47	97.92	40	83.33	25	52.08	159	83.25
Fruits**	47	100.00	48	100.00	48	100.00	29	60.42	172	90.05
Meats	2	4.26	2	4.17	2	4.17	0	0.00	6	3.14
Eggs	11	23.40	16	33.33	12	25.00	6	12.50	45	23.56
Powdered Milk*	3	6.38	1	2.08	6	12.50	10	20.83	20	10.47
Fruit Juice*	4	8.51	5	10.42	9	18.75	15	31.25	33	17.28
Processed/Ultra-processed Foods*	4	8.51	3	6.25	12	25.00	11	22.92	30	15.71
Culinary Ingredients	3	6.38	3	6.25	1	2.08	0	0.00	7	3.66

Note: *$p<0.05$; **$p<0.01$. Chi-Square Test. The quartiles were established with the following thresholds: the first quartile consisted of cities with up to 1,414 students; the second quartile included cities with 1,419 to 3,396 students; the third quartile comprised cities with 3,404 to 10,480 students; and the fourth quartile encompassed cities with 11,004 or more students, with the largest municipality reaching 1,029,862 students.

DISCUSSION

The findings of the present study reinforce the role of family farming within the scope of the PNAE in promoting healthy and adequate food. In addition, the challenges faced by larger municipalities in acquiring fresh foods – especially fruits, leafy greens, roots, and tubers – are evidenced by demands related to receiving, storage, and distribution logistics. Furthermore, the difficulties imposed by the legal changes occurring in 2020 are presented, which, in 2021, were still not followed by the majority of the studied municipalities in São Paulo, particularly regarding the selection criteria for sales projects, as well as the consequences of the pandemic imposed during this same period.

Only two municipalities did not describe the price that should be paid for the food in the PC; this result highlights an advancement in compliance with legislation, given that, as verified in previous studies, public calls did not provide all the necessary information for producers to establish their prices, indicating a failure in the relationship between buyer and seller [16]. In Rio Grande do Sul, a study analyzing public calls identified descriptions of the delivery type, product type, frequency, and prices; 47.4% of the PC presented a weekly delivery schedule, and prices were present in only 60% of the analyzed calls [17].

Another relevant piece of information observed in the public calls was the adequate description of the selection criteria for sales projects (39.27%; n=75), associated with the citation of the current legislation, which was identified in only 31.94% of municipalities (n=61). This finding suggests a low level of appropriation by the municipalities of the recently published legislation, especially in the context of PNAE adaptations in response to the pandemic [18].

In turn, socio-biodiversity and regional foods were present in the majority of the PC, contrary to what was identified in Minas Gerais, where an incipient presence of socio-biodiversity foods in school feeding was observed in this study. The authors suggest that this occurs due to the homogenization of school menus, which are developed without a prior survey of local production, and end up imposing the production of foods that fit within a standardized dietary pattern on farmers [19].

Compliance with the procurement of at least 30% of federal resources with family farming foods remains a challenge for the state of São Paulo; less than one-third of the municipalities acquired

the established minimum (n=45; 23.56%), and nearly the same percentage of municipalities did not acquire any food from family farming (n=44; 23.04%). Machado et al. (2018) [20] identified the state of São Paulo as having the lowest family farming procurement for school feeding in the Southeast region, and in 2019, Araújo et al. [21] corroborated this data, showing that this region of the country acquired the least from FF from 2011 to 2017 (6.4%) [21]. Furthermore, national data show a drop in the percentage of FF purchases in 2020 and 2021, with an increase in 2022 higher than that of 2019, with values of 16.70%, 19.05%, 45.15%, and 37.34%, respectively [22]. This can be justified by the fact that it was the pandemic period, during which PNAE legislation was altered, providing benefits for access to school feeding for students who were in their residences, but weakening FF procurement, which was not yet consolidated according to the data presented [12]. In this context, the number of Public Calls identified in the present study may be underestimated, considering the fragility of the period analyzed and the possibility that some of the planned acquisitions were not finalized. The literature corroborates this hypothesis by highlighting the worsening of food insecurity among family farmers during the pandemic, a scenario directly impacted by the operationalization and completion of institutional purchases [23].

However, in a study comparing pre- and post-pandemic food profiles (2019 and 2021), a 39% reduction in the purchase of ultra-processed foods was observed. In the post-pandemic period, in line with the update of school feeding legislation, the procurement of fresh and minimally processed foods represented 73.39% of food acquisitions [24].

Although the groups of fruits, leafy greens, roots, and tubers are present in all municipalities, they remain more prevalent in small-sized municipalities, suggesting a favorable practice for providing a healthier diet in these locations; this same scenario was found in São Paulo in 2013 [16], and in the state of Paraná, a greater investment by school feeding in the acquisition of fruits, lean meats, and cereals was also identified [25].

Corroborating the present study, others have also found a predominance of fresh and minimally processed foods in the PC [17]; however, it is worth noting that all São Paulo municipalities that participated in this research published at least one food item from this group in their PC – a very important finding not previously identified in the literature.

The presence of processed/ultra-processed foods was more closely linked to larger municipalities, which, according to Dias et al. (2020), have specific characteristics and require additional investment in infrastructure to meet logistical demands and intersectoral articulation strategies involving sectors responsible for public procurement, policy managers, nutritionists, farmers, and technical assistance agencies focused on rural extension to guarantee the acquisition of fresh and minimally processed foods [26]. In this regard, it is emphasized that, in general, large-scale municipalities with mixed, decentralized, or outsourced school feeding management and without a nutritionist as the technical manager show a lower frequency of food procurement from family farming [21].

The study presents limitations inherent to the use of secondary data restricted to São Paulo, which precludes the possibility of making inferences on a national scale. Furthermore, the analysis exclusively included Public Calls linked to Codeagro, an agency of the Secretariat of Agriculture and Supply from the São Paulo state and did not include any institutional purchases conducted by other state secretariats. Although such acquisitions are not generally intended for school feeding, in exceptional contexts – such as the pandemic period – institutional redirections may have occurred that were not captured in the analyzed database. The present study innovates by shifting the focus to the moment when the dietary profile was previously structured by public authorities.

CONCLUSION

Compliance with PNAE legislation in the first year following its update, combined with the experience of a pandemic year, highlighted vulnerabilities in the School Feeding Policy regarding the procurement of products from family farming. These weaknesses were evident both in the drafting process of public calls and in the actual execution of acquisitions, which remained below the minimum required percentage for most municipalities in São Paulo.

The presence of fresh, unprocessed foods in all public calls from São Paulo state is noteworthy, reinforcing the role of family farming in promoting healthy and adequate nutrition grounded in a sustainable food system. Nevertheless, compliance with current legislation is essential to prioritize local production. Furthermore, the challenges faced by larger municipalities in procuring in natura foods – particularly fruits, leafy greens, roots, and tubers – are evident, given the demands associated with the logistics of receiving, storing, and distributing these products.

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