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CHAPTER 12

Contributions and Challenges of the National School Feeding Program (PNAE) in Promoting a Healthy and Adequate School Food Environment

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FOOD SYSTEMS AND THEIR COMPONENTS

Malnutrition, which encompasses both undernutrition and obesity, is one of the major global health challenges (WHO, 2017; HLPE, 2017). The coexistence of these two extremes, hunger and obesity, represents the phenomenon of the “double burden of malnutrition” (WHO, 2017; Wells *et al.*, 2020). In light of the various challenges the world faces, including hunger and obesity, the United Nations (UN) established the 2030 Agenda in 2015, composed of 17 Sustainable Development Goals (SDGs), with the aim of eradicating poverty and promoting global well-being. Among the 17 goals, SDG 2 aligns with the challenge of the double burden of malnutrition, aiming to “End hunger, achieve food security and improved nutrition, and promote sustainable agriculture” (United Nations, 2015, p. 19), highlighting the importance of nutrition in the global agenda (PAHO, 2017).

However, a report by the Food and Agriculture Organization (FAO) (2020) on food security and nutrition emphasizes that achieving the SDG 2 goals requires not only access to sufficient food but also quality food. Diet quality is seen as a vital link in the fight against all forms of malnutrition, including undernutrition and obesity. Furthermore, experts have identified a “Global Syndemic” composed of three major challenges for global public health: obesity, undernutrition, and climate change. These challenges are intrinsically linked to a dominant global food system model that promotes unhealthy diets and perpetuates inequalities in food distribution (Swinburn *et al.*, 2019).

In 2017, the FAO presented a theoretical model on food systems developed by a High-Level Panel of Experts. The main objective of this report was to analyze how food systems influence people’s eating habits and to highlight how effective programs and policies have the potential to shape food systems, promoting the sustainable production, distribution, and consumption of food, in addition to ensuring the right to food for all (HLPE, 2017).

According to the HLPE report (2017, p. 11), the food system consists of:

[...] the collection of all elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities related to the production, processing, distribution, preparation, and consumption of food, and the outcomes of these activities, including socio-economic and environmental outcomes.

The theoretical model of food systems presented in the FAO High-Level Expert Panel report (HLPE, 2017) consists of three components: food supply chains, food environments, and consumer behavior. These elements are influenced by drivers (factors driving change in the food system), such as: biophysical and environmental factors; innovation, technology, and infrastructure; political and economic factors; socio-cultural factors; and demographic factors.

Biophysical and environmental drivers encompass the available natural resources, essential ecosystem services, and climate change. Meanwhile, political and economic drivers include factors such as leadership, globalization, foreign investment, international trade, food policies, land tenure issues, food price fluctuations, price volatility, conflicts, and humanitarian crises (HLPE, 2017).

In the realm of socio-cultural drivers, elements such as culture, religion, rituals, social traditions, and women's empowerment are highlighted, all exerting significant influence on food systems. Lastly, demographic drivers refer to aspects such as population growth, changes in age distribution, urbanization, migration, and forced displacement, which shape the dynamics of food systems (HLPE, 2017).

Regarding the components that integrate food systems, the food supply chain encompasses a series of activities ranging from food production to final consumption and waste management (HLPE, 2017).

The food environment refers to the "physical, economic, political, and socio-cultural context in which consumers engage with the food system to

make decisions about acquiring, preparing, and consuming food” (HLPE, 2017, p. 28). Therefore, the food environment plays a fundamental role in influencing individuals’ food choices. It is important to note that while healthy food environments provide adequate and nutritious food choices, there is currently a significant prevalence of “unhealthy” food environments worldwide that promote less healthy food choices (HLPE, 2017).

Finally, the last component is the consumer, characterized by the choices consumers make regarding the selection, storage, preparation, and consumption of food, either individually or within families. It is important to emphasize that food choices are influenced by personal factors, convenience, cultural aspects, beliefs, and other elements. However, it is crucial to recognize that eating behavior is substantially shaped by the food environment. These three components that comprise food systems (and are influenced by drivers) play a decisive role in the quality of individuals’ diets, resulting in consequences for nutrition and health, as well as generating impacts on social, economic, and environmental dimensions (HLPE, 2017).

In the context of the elements that make up food systems, the food environment stands out significantly as it exerts substantial influence on individuals’ consumption behavior and, consequently, their diet. In this regard, a highly relevant study was conducted by Glanz *et al.* (2005), who classified the food environment as: organizational, community, consumer, and informational environment.

People interact with various food environments, but it is worth highlighting the school food environment, as many children spend a significant part of their time at school and have their main meals in this environment. One way to ensure that children have access to healthy and adequate food in the school food environment is through public policies, such as the National School Feeding Program (PNAE), a Brazilian government program that aims to provide quality school meals to public elementary school students. The PNAE seeks to promote educational development and contribute to the formation of healthy eating habits. In this context, the present chapter aims to

analyze the challenges and contributions of the PNAE in promoting a healthy and adequate food environment.

For this chapter, it is worth highlighting the organizational food environment, which includes places where people spend a significant part of their time, such as schools, workplaces, and hospitals, for example. The availability of healthy or unhealthy foods in these institutions can significantly influence individuals' food choices. School food policies, for example, can affect the type of food children consume daily (Glanz *et al.*, 2005).

FOOD SECURITY AND NUTRITION

Food Security and Nutrition (SAN) represents the realization of the universal right of all to the constant availability of high-quality food in adequate quantities, without compromising access to other essential needs. This goal is achieved through dietary practices that promote health, respect cultural diversity, and are socially, economically, and environmentally sustainable (CONSEA, 2004).

Food security is often analyzed under four interdependent dimensions: food availability, food access, food utilization, and food stability. Food availability refers to the quantity of food available in a region or community. Access to food encompasses both economic and physical aspects. Economic accessibility refers to the resources needed for people to acquire quality and nutritious food year-round (Leão, 2013).

Physical accessibility means that food must be accessible to all population groups, from infants to the elderly, as well as individuals with physical disabilities, terminal patients, those facing health challenges, inmates, and others. Additionally, it is crucial to ensure access to food for those living in remote areas, facing natural disasters or armed conflicts, including indigenous peoples and other vulnerable groups (Leão, 2013).

The food and nutrient utilization dimension corresponds to the biological utilization and includes how people use available food to meet

their nutritional needs. It includes knowledge about nutrition, food preparation practices, and eating habits (FAO, 2014). Finally, food stability refers to the consistency of food access over time (Leão, 2013).

Considering this, as stipulated in Decree No. 7,272 of August 25, 2010, which follows the guidelines of the National Food and Nutrition Security System (SISAN), everyone is guaranteed not only the right to food as a mere requirement for survival but also the right to healthy and adequate food that can promote and ensure the health and well-being of individuals. However, to ensure this right, it is essential to develop sustainable food systems to provide everyone with access to healthy, safe, quality food in adequate quantities (GLOPAN, 2016).

Food systems directly influence the SAN framework as they are responsible for the nature of food, its production, and final consumption. Policies, programs, and institutional actions influence food systems to promote SAN, and among the policies that can influence food system components, the PNAE stands out (HLPE, 2017).

THE PNAE – NATIONAL SCHOOL FEEDING PROGRAM AND ITS CHALLENGES

The PNAE aligns with the guidelines of international organizations such as the FAO, which has encouraged actions to ensure SAN in countries, indicating the adoption of public policies that institutionalize the pursuit of SAN. One of the 17 SDGs proposed by the FAO expresses this concern and guides the tasks to be implemented by governments, society, and the production sector so that by 2030 a more sustainable world is achieved, in an attempt to integrate the SDGs with the actions of the countries involved (UN BR, 2021). SDG 2, namely, “zero hunger and sustainable agriculture,” focuses on stimulating sustainable agricultural practices through family farming with access to land, technologies, and markets. In this global concern with public policies that ensure adequate food for children, programs like the PNAE are included.

The PNAE is a public policy adopted in Brazil that plays a fundamental role in promoting education and combating hunger and malnutrition

(Abrandh, 2013; Silva; Hespanhol, 2019; Lourenzani; Cardoso, 2020). The program operates through the transfer of financial resources from the federal government to states and municipalities, which are responsible for its implementation. The resources must be used for purchasing food and preparing meals in schools. These foods must be fresh, nutritious, and of high quality, adhering to the principles of healthy eating (FNDE, 2014).

The concern with adequate food has been the subject of public policies in Brazil since the 1950s. This concern has evolved significantly over the years, acquiring national relevance as a public food security policy in Brazil. The construction of the PNAE is in line with constitutional determination and is supported by the Federal Constitution of 1988, which ensures the right to food as one of the fundamental rights. Article 208, item VII, establishes the State's obligation to provide school meals to students in Basic Education, promoting equal opportunities in access to education (Brazil, 1988).

The same Constitution mandated compulsory Basic Education, which led many young people and children to enter the school environment. A great challenge and an opportunity to offer this population a healthy diet, thus necessitating a program to manage school feeding policies and assist states and municipalities, such as the National Education Development Fund (FNDE) (FNDE, 2014). The enactment of Law No. 11,947/2009 mandates that 30% of the amount transferred by the PNAE must be invested in the direct purchase of products from family farming, a measure that stimulates healthy eating for students and economic development and market access for family farming (Brasil, 2009). It was noted that indirectly the law guaranteed rural family farmers participation in the fundamental right to food for elementary school students by ensuring a minimum percentage presence in school meals. This law was of fundamental importance as it established guidelines for the organization and operation of the program, promoting local development and access to fresh and healthy food from local family farming.

The FNDE (2020) is the body responsible for implementing the PNAE. It issues various resolutions detailing procedures, criteria, and standards for the program's operation in partnership with states and

municipalities. Additionally, it defines guidelines in its documents ranging from food procurement to accountability, ensuring transparency and efficiency in the use of public resources.

Although the right to food has been enshrined as a universal human right and despite all the technological and scientific advances that enable abundant food production, FAO data indicates that many people still suffer from hunger worldwide and in Brazil (UN BR, 2014). To address this universe of young people facing food and nutrition insecurity, the PNAE is governed by the principle of universality, meaning it must serve all students enrolled in the public education system, regardless of their socioeconomic status, race, or origin, in compliance with the Federal Constitution, which establishes equal rights for all citizens.

The PNAE also relies on social participation and control, ensuring that the school community and civil society have an active voice in monitoring and overseeing the program's implementation. This is essential to prevent deviations and ensure the quality of school meals (Silva; Hespanhol, 2019).

The PNAE plays a crucial role in promoting the right to adequate food, contributing to the physical and cognitive development of children and adolescents. Additionally, it helps combat school dropout rates, as the provision of attractive meals in schools encourages student attendance. This also contributes to reducing social inequalities, as it primarily serves the most vulnerable population (FNDE, 2014).

Despite its importance, the PNAE faces several challenges. One of them is ensuring food quality, as in many cases, product selection is based on the lowest cost, compromising the provision of healthy meals. Additionally, the infrastructure of schools, such as adequate kitchens, is not always available, making meal preparation difficult. Another challenge is oversight and social control. Society needs to be involved in monitoring the program, ensuring that resources are properly applied and the quality of meals is maintained (Leite, 2022).

Given this, the PNAE is an extremely relevant public policy in the Brazilian context. It plays a vital role in promoting education and ensuring

the right to adequate food. However, it is necessary to overcome existing challenges, ensuring that the program fully achieves its objectives and contributes to building a more just and equal country. Social participation, improving food quality, and adequate school infrastructure are essential steps in this direction (Leite, 2022).

In the next section, the implementation of the PNAE in the municipality of Tupã, located in the interior of the state of São Paulo (SP), will be presented to identify the agents involved in the program, the challenges, and the main points that contribute to fostering family farming and the challenges and contributions of the PNAE related to the school food environment in the municipality.

IMPLEMENTATION OF THE PNAE IN THE MUNICIPALITY OF TUPÃ

Addressing the challenges of implementing healthy public food policies requires specific studies that allow an understanding of the interrelationship between food production, especially family farming, the PNAE, and local program management activities, which can drive such policies.

Leite's (2022) study presents an attempt, through a master's thesis, to contribute to this discussion. The research raises the contributions of an association that supplies family farming food, interfaces with family farmers, observes challenges and impacts on their practice, as well as the role of public managers in articulating public policies that ensure SAN, especially the nutritionists in the municipality's pilot kitchen. Data collection was conducted through open-ended questionnaires, with a direct approach to selected individuals: the Municipal Education Secretary, the nutritionist responsible for the pilot kitchen, the technician responsible for the Banana Growers Association, and selected associated farmers.

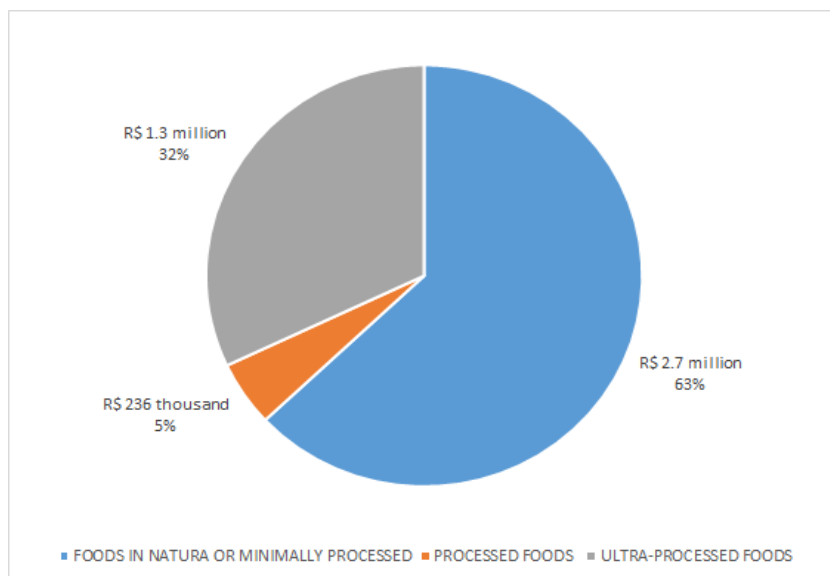
To conduct the interviews, a script was developed to gather the most relevant information for the research objective; the first approach was with the Municipal Manager for his role as Municipal Education Secretary and his decision-making role in the process. An interview was conducted to

map the process and its difficulties. Next, the nutritionist responsible for the pilot kitchen was interviewed to understand her role in the purchasing process and menu development. Subsequently, the person responsible for the contracts of the Banana Growers Association of Tupã was interviewed to understand his role in food procurement in the municipality's public calls. The final stage of interviews was with family farmers supplying the Banana Growers Association.

Ten farmers with active links to the Banana Growers Association were selected based on their availability for interviews, as only these were willing to provide information. The Food Guide for the Brazilian Population was used as an analysis tool to identify whether the items purchased by the PNAE contribute to a school food environment that promotes adequate and healthy eating for students. The reference point for this analysis was the year 2019.

By analyzing all the food purchased in 2019, a significant participation of unprocessed or minimally processed foods (63%) was noted, as well as oils, fats, salt, and sugar, in the menu offered by the Pilot Kitchen, with significant participation of products offered by local family farming through the Banana Growers Association. A higher percentage of ultra-processed foods compared to processed foods was also observed, posing a challenge to improving the school meal menu (Figure 1).

Figure 1 – Proportion of food in 2019 according to the Food Guide, in terms of expenditure (R\$)



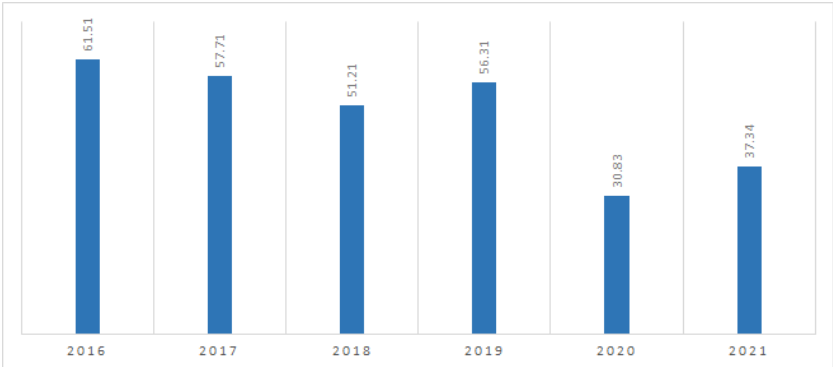
Source: Leite (2022).

Regarding SAN, the nutritionist considers the meals served balanced, striving to vary and adapt the menu to the foods offered by local family farming. Some foods are difficult to incorporate into school meals since children are accustomed to ultra-processed foods at home. Despite the resistance to healthy foods, the nutritionist remains committed to offering them in meals, for example, by finely chopping carrots and green beans with meat, and cabbage with ground beef.

The study highlights the challenges faced by the PNAE in Tupã in promoting healthy eating in the school food environment, due to the persistence of ultra-processed food consumption. Additionally, it emphasizes the importance of family farming as a valuable partner in providing fresh and nutritious food for school meals, benefiting both sides. It becomes evident that a collaborative approach is necessary in implementing public food policies in schools.

The Banana Growers Association works to organize small rural producers, providing support and knowledge transfer so that producers can meet the demands in the municipality of Tupá. However, not all municipalities have this association, necessitating the involvement of all small producers to participate in public calls. Unfortunately, many do not participate because they lack the required documentation for the PNAE. The hypothesis of the Association's strategic role was confirmed in the data collection. The more efficient information management, the more opportunities are generated for producers, overcoming bureaucracy through information transfer by the Association.

Figure 2 – PNAE Transfer Percentage



Source: Leite, 2022.

The study shows that it is possible to meet mandatory percentages to encourage healthy habits and strengthen family farming, a joint effort aimed at ensuring SAN, as observed in Figure 2, which shows the percentage of FNDE resource transfers for the purchase of family farming food from 2016 to 2021.

FINAL CONSIDERATIONS

The discussion on food systems and food environments is extremely relevant in the current global health context, as it is directly related to the challenges of the double burden of malnutrition, which includes challenges related to undernutrition (low weight and nutrient deficiencies) as well as obesity (overweight).

Based on this scenario, it is important to promote healthy and sustainable food systems. However, it is important to highlight that a healthy food system is not limited to people having access to sufficient food but also to the availability of quality food. Diet quality is essential in the fight against all forms of malnutrition, including undernutrition and obesity. However, the dominant global food system model promotes unhealthy diets and creates inequalities in food distribution.

Food systems are complex and composed of various elements, including the food supply chain, food environments, and consumer behavior. The food environment significantly influences people's consumption behavior and, consequently, their diet. Healthy food environments promote adequate and nutritious food choices, while unhealthy food environments can lead to less healthy choices.

One way to promote food systems and environments that allow people to access healthy and adequate food is through public policies. A relevant example is the school food environment, where public policies, such as the PNAE, play a fundamental role in promoting healthy eating among children. The PNAE acts as an important piece in promoting a healthy food environment in Brazilian schools. This program, aligned with national guidelines and international food and nutrition security orientations, plays a vital role in transforming the school food environment into a conducive space for adequate and healthy food choices.

Observing the implementation of the PNAE in different municipalities, such as the case study in Tupá, it becomes clear that this program is not just an initiative to provide meals, but also an opportunity to influence food choices and, consequently, the quality of students' diets. This is particularly relevant, considering that many children spend

a significant part of their time at school and have crucial meals for their development in this environment.

The association of the PNAE with local family farming is a valuable example of how this program can contribute to a healthier food environment and a more sustainable food system. By encouraging the purchase of fresh and nutritious locally produced food, the PNAE not only provides quality meals but also strengthens local communities and promotes sustainable agricultural practices.

However, the PNAE also faces significant challenges, as observed in the case study, such as students' preference for ultra-processed foods and the need to ensure the quality of purchased foods. Overcoming these challenges requires collaboration among different actors, including the public sector, farmers, associations, and civil society. Thus, it is necessary to establish governance that allows for articulation and alignment among the involved actors so they can address the problem of food and nutrition insecurity and contribute to achieving the goals set in SDG 2.

REFERENCES

- AÇÃO BRASILEIRA PELA NUTRIÇÃO E DIREITOS HUMANOS (ABRANDH). *O direito humano à alimentação adequada e o sistema nacional de segurança alimentar e nutricional*. Brasília, DF: MDS, 2013. Disponível em: http://www.mds.gov.br/webarquivos/publicacao/seguranca_alimentar/DHAA_SAN.pdf. Acesso em: 4 set. 2023.
- BRASIL. Decreto nº 7.272, de 25 de agosto de 2010. Regulamenta a Lei no.11.346, de 15 de setembro de 2006. Cria o Sistema Nacional de Segurança Alimentar e Nutricional – SISAN com vistas em assegurar o direito humano à alimentação adequada e dá outras providências. *Lex*, Brasília, 2006. Disponível em: http://www.planalto.gov.br/ccivil_03/_Ato2007/2010/2010/Decreto/D7272.htm. Acesso em: 16 set. 2023.
- BRASIL. Constituição (1988). *Constituição da República Federativa do Brasil*. Brasília, DF: Planalto, 1988. Disponível em: http://www.planalto.gov.br/ccivil_03/constituicao/constituicao.htm. Acesso em: 15 jul. 2023.
- BRASIL. Ministério da Educação. *Lei nº 11.947, de 16 de junho de 2009*. Dispõe sobre o atendimento da alimentação escolar e do Programa Dinheiro Direto na Escola aos alunos da educação básica; altera as Leis nos 10.880, de 9 de junho de 2004, 11.273, de 6 de fevereiro de 2006, 11.507, de 20 de julho de 2007; revoga dispositivos da Medida Provisória no 2.178-36, de 24 de agosto de 2001, e a Lei no 8.913, de 12 de

julho de 1994; e dá outras providências. Brasília, DF: Planalto, [2009]. Disponível em: http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2009/lei/l11947.htm. Acesso em: 05 set. 2023.

BRASIL. *Guia alimentar para a população brasileira*. Brasília, DF: MDS, 2014. Disponível em: https://bvsms.saude.gov.br/bvs/publicacoes/guia_alimentar_populacao_brasileira_2ed.pdf. Acesso em: 9 dez. 2023.

CONSELHO NACIONAL DE SEGURANÇA ALIMENTAR E NUTRICIONAL (CONSEA). *Princípios e Diretrizes de uma Política de Segurança Alimentar e Nutricional*: Textos de Referência da II Conferência Nacional de Segurança Alimentar e Nutricional. Brasília, DF: IPEA, 2004. Disponível em: https://www.ipea.gov.br/participacao/images/pdfs/conferencias/Seguranca_Alimentar_II/textos_referencia_2_conferencia_seguranca_alimentar.pdf. Acesso em: 12 jul. 2023.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS (FAO). *The State of Food Security and Nutrition in the World 2020: Transforming food systems for affordable healthy diets*. Rome: FAO, 2020. Disponível em: <http://www.fao.org/3/ca9692en/CA9692EN.pdf>. Acesso em: 20 out. 2023.

FUNDO NACIONAL DE DESENVOLVIMENTO DA EDUCAÇÃO (FNDE). *Sobre o PNAE: O que é? A quem se destina?* Brasília: FNDE, 2020. Disponível em: <http://www.fnde.gov.br/programas/pnae>. Acesso em: 5 jun. 2023.

FUNDO NACIONAL DE DESENVOLVIMENTO DA EDUCAÇÃO (FNDE). *Cartilha Nacional da Alimentação Escolar*. Brasília, DF: FNDE, 2014. Disponível em: <http://www.fnde.gov.br/arquivos/category/116-alimentacao-escolar?download=9572:pnae-cartilha-2014>. Acesso em: 20 jan. 2023.

GLANZ, K.; SALLIS, J. F.; SAELENS, B. E.; FRANK, L. D. Healthy Nutrition Environments: Concepts and Measures. *American Journal of Health Promotion*, Thousand Oaks, v. 19, n. 5, p. 330-333, 2005.

GLOBAL PANEL ON AGRICULTURE AND FOOD SYSTEMS FOR NUTRITION (GLOPAN). *Food systems and diets: facing the challenges of the 21st century*. London: Glopan, 2016. Disponível em: <https://www.glopan.org/wp-content/uploads/2019/06/ForesightReport.pdf>. Acesso em: 10 abr. 2023.

HIGH LEVEL PANEL OF EXPERTS (HLPE). *Nutrition and food systems: a report by the high level panel of experts on Food Security and nutrition of the Committee on World Food Security*. Roma: FAO, 2017. Disponível em: www.fao.org/cfs/cfs-hlpe. Acesso em: 5 set. 2023.

LEÃO, M. (org.). *O direito humano à alimentação adequada e o sistema nacional de segurança alimentar e nutricional*. Brasília, DF: ABRANDH, 2013. Disponível em: <https://bit.ly/2KbLoi3>. Acesso em: 20 out. 2023.

- LEITE, P. C. M. P. *O Papel do PNAE para a Agricultura Familiar e Alimentação Saudável no município de Tupã/SP*. 2022. 44 f. Dissertação (Mestrado em Agronegócio e Desenvolvimento) - Faculdade de Ciências e Engenharia, Universidade Estadual Paulista, Tupã, 2022. Disponível em: <https://repositorio.unesp.br/handle/11449/217735>. Acesso em: 6 set. 2023.
- LOURENZANI, A. E. B. S.; CARDOSO, V. A. O Programa Nacional de Alimentação Escolar no município de Tupã e seus efeitos na agricultura familiar. *Formação Online*, Presidente Prudente, v. 26, n. 48, p. 200-2019, 2019. Disponível em: <https://revista.fct.unesp.br/index.php/formacao/article/view/5829/5041>. Acesso em: 3 jun. 2023.
- NAÇÕES UNIDAS NO BRASIL (ONU BR). *17 Objetivos para transformar o mundo*. Nova Yorke: ONU, 2021. Disponível em: <https://nacoesunidas.org/pos2021/>. Acesso em: 7 jan. 2024.
- NAÇÕES UNIDAS NO BRASIL (ONU BR). *O Estado da Segurança Alimentar e Nutricional no Brasil*. Um retrato multidimensional. Relatório 2014. Brasília, DF: MDS, 2014. Disponível em: https://www.mds.gov.br/webarquivos/publicacao/seguranca_alimentar/SANnoBRasil.pdf. Acesso em: 2 set. 2023.
- ORGANIZAÇÃO PAN-AMERICANA DA SAÚDE (OPAS). *Sistemas alimentares e nutrição: a experiência brasileira para enfrentar todas as formas de má nutrição*. Brasília, DF: CFN, 2017. Disponível em: <https://www.cfn.org.br/wp-content/uploads/2017/09/oms.pdf>. Acesso em: 20 out. 2023.
- SILVA, E. R. F.; HESPANHOL, R. A. M. Políticas públicas e a criação de programas governamentais de alimentação: algumas considerações. *Formação (Online)*, Presidente Prudente, v. 26, n. 49, p. 7-35, 2019. Disponível em: <https://revista.fct.unesp.br/index.php/formacao/article/view/6328/5181>. Acesso em: 7 set. 2023.
- SWINBURN B *et al.* The Global Syndemic of Obesity, Undernutrition, and Climate Change: The Lancet Commission report. *The Lancet*, London, v. 393, n. 10173, p. 791-846, 2019.
- UNITED NATIONS. *Transforming our World: The 2030 Agenda for Sustainable Development*. New York: United Nations, 2015. Disponível em: <https://bit.ly/3oVMm0M>. Acesso em: 22 jan. 2024.
- WELLS, J. C.; SAWAYA, A. L.; WIBAEK, R., MWANGOME, M., POULLAS, M. S., YAJNIK, C. S. *et al.* The double burden of malnutrition: aetiological pathways and consequences for health. *The Lancet*, London, v. 395, p. 75-78, 2020.
- WORLD HEALTH ORGANIZATION (WHO). *Double burden of malnutrition: policy brief*. Geneva: WHO, 2017. Disponível em: <https://www.who.int/publications/item/WHO-NMH-NHD-17.2>. Acesso em: 18 ago. 2023.