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Knowledge and action of the nutritionist about sustainable diets in school feeding

Conhecimento e atuação de nutricionistas da alimentação escolar sobre dietas sustentáveis

Abstract

Introduction: Sustainability issues in the National School Feeding Program (PNAE, in its acronym in Portuguese) have been increasingly pressing, and nutrition professionals are key in this process. ***Objectives:*** To verify knowledge, actions and importance given to the sustainable diets dimensions by nutritionists working in school feeding programs in the southwestern and western State of Paraná, Brazil. ***Methods:*** This is a cross-sectional study based on an online questionnaire on knowledge, importance given to, and actions regarding sustainability, which was answered by 32 nutritionists. The PSPP software, for descriptive analysis, and the Mann Whitney test were used. ***Results:*** It was found that most respondents (62.5%) did not have academic training on the subject and considered they did not have sufficient knowledge about sustainable diets. Although all of them consider sustainability aspects to be very or moderately important, the environmental dimension had the lowest percentage as "very important" (75%). Regarding actions, it was observed that those related to compliance with legislation and economy obtained greater adherence from nutritionists. A significant association ($p<0.05$) was found between the importance given to the economic dimension and the number of sustainability actions carried out by nutritionists. The data show that professionals who carry out more sustainable actions tend to be those more concerned with economic aspects than with environmental aspects. ***Conclusion:*** There is a need for training and awareness about sustainable diets for these professionals so that they can understand more deeply what the topic encompasses and have more clarity about the actions they must take to achieve sustainability, as well as more financial resources for it.

Keywords: Diet. School Feeding. Nutritionist. Environment

Resumo

Introdução: Questões sobre sustentabilidade no Programa Nacional de Alimentação Escolar estão cada vez mais prementes e o profissional nutricionista é chave nesse processo. ***Objetivos:*** Verificar o conhecimento, as ações e a importância dada às dimensões das dietas sustentáveis de nutricionistas que atuam na alimentação escolar no sudoeste e oeste do estado do Paraná. ***Métodos:*** Trata-se de uma pesquisa transversal, feita a partir de questionário *on-line* sobre conhecimentos, importância e ações de sustentabilidade, respondido por 32 nutricionistas. Foi utilizado *software* PSPP para análises descritivas e teste de Mann Whitney. ***Resultados:*** Verificou-se que a maioria (62,5%) não teve formação acadêmica sobre o assunto e pondera não ter conhecimentos suficientes sobre dietas sustentáveis. Embora todos considerem de muita ou média importância os aspectos de sustentabilidade, a dimensão ambiental foi a que obteve menor percentual de "muita importância" (75%). Em relação às ações, observou-se que as que obtiveram maior aderência dos nutricionistas eram as relativas ao cumprimento de legislações e à economicidade. Encontrou-se associação

significativa (p<0,05) entre a importância dada à dimensão econômica e a quantidade de ações propositivas de sustentabilidade realizadas pelos nutricionistas. Os dados demonstram que os profissionais que realizam mais ações sustentáveis tendem a ser aqueles mais preocupados com os aspectos econômicos do que propriamente com aspectos ambientais. *Conclusão:* Há necessidade de formação e sensibilização destes profissionais sobre dietas sustentáveis para que possam compreender melhor o que isso abrange e tenham mais clareza sobre as ações que devem realizar para alcançar a sustentabilidade, além de mais recursos financeiros para tal.

Palavras-chave: Dieta. Alimentação escolar. Nutricionista. Meio ambiente.

INTRODUCTION

It is widely known that adequate and healthy food is a basic human right. According to the Guia Alimentar para a População Brasileira[1] ("Dietary Guidelines for the Brazilian Population"), it must meet biological and social needs and consider food culture and gender, race and ethnicity aspects. It must also be accessible, harmonious regarding quantity and quality, and compliant with the principles of variety, balance, moderation, and pleasure. Finally, the document mentions sustainable production practices. Thus, discussions about what are adequate diets have added sustainability and healthy and sustainable diets to this set of elements.[2]

According to the Food and Agriculture Organization of the United Nations, sustainable diets:[3]

> are those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.[3]

Based on this concept of sustainable diets and the literature, some important dimensions involved in its implementation are particularly relevant. The environmental dimension stands out for relating the food system to impacts on the ecosystem, the use of natural resources, and climate change. The health dimension focuses on the nutritional aspect of diets and the effects of food on the human body. Regarding the social and cultural dimensions, respect for different cultures, their eating habits, and social equity are key aspects for the protection of the Human Right to Adequate Food (HRAF) and discussions on Food Sovereignty and Food and Nutrition Security. Finally, the economic dimension relates directly to the others, as it refers to access to nutritional, cultural and environmental quality food for all and the expenses/costs/conditions involved in its acquisition. However, macroeconomic factors are not always conducive to the HRAF and environmental and social propositions, making it one of the most critical dimensions towards sustainability.[2-4]

The National School Feeding Program (PNAE) is a food policy that may work as an instrument for enabling more sustainable diets and eating patterns. Established in 1955, it is one of the most long-lasting public food programs in Brazil and serves all students in public and philanthropic schools of basic/secondary/technical education.[5] In its latest Resolution No. 6/2020[6] and in accordance with Law No. 11947/2009,[7] one of the PNAE guidelines is to support sustainable development through incentives to purchase diversified foodstuffs, produced locally and preferably by family farmers and rural family businesses, prioritizing traditional indigenous and quilombo remnant communities. It also alludes to sustainability when indicating that food education actions to be carried out at school must include these concerns. And regarding menus, the legal guideline is having nutrition technical managers guided by sustainability, seasonality and local agricultural diversification, as well as the promotion of adequate and healthy food.

Some studies that discuss the combination of sustainability and school feeding[8-11] point to the PNAE's potential to enable food systems based on the production of organic/agroecological foods by including socio-biodiversity products and prioritizing the choice of less processed foods and with less animal protein. Careful preparation of meals; disposal, use and reuse of products; cautious selection of utensils, equipment, hydraulic and electrical installations, among others, are also included as important factors. The same studies also point out obstacles for the completion of these actions.

Therefore, in recent years, new demands regarding sustainability have been created in the PNAE, posing new challenges to nutrition professionals, who do not always have training, knowledge and sensitiveness to these aspects. In addition, there are few studies investigating what PNAE nutritionists understand about sustainable diets, the importance they give to the different dimensions of sustainability and their respective actions towards it, which makes the purpose of this study a relevant research theme today.

This study sought to answer the following questions: do PNAE nutritionists have training and knowledge about sustainable diets? What is the level of importance they give to the different dimensions of sustainability and their actions towards it? Thus, it aimed to verify the knowledge, actions and importance that nutritionists working in the PNAE give to the different aspects of sustainability. More specifically, it aimed to identify whether they have knowledge about what a sustainable diet is, to verify the importance they have given to each aspect of sustainable diets when planning the menus, the actions they have taken towards sustainability, and to analyze relationships between these variables.

METHODS

This is an exploratory cross-sectional study, with primary data collection. The surveyed nutritionists were from the southwestern and western State of Paraná, consisting of 42 and 54 municipalities, respectively. Thus, the sample was defined as the sum of all locations and their nutrition managers (one per location), totaling a population of 96 professionals. They were contacted via email and WhatsApp application.

Data was collected through the application of a questionnaire with 43 questions sent via Google Forms for online responses, from April to December 2020. This instrument was adapted from other pre-existing instruments[12,13] that had questions about sustainability-related actions carried out in Unidades de Alimentação e Nutrição ("Food and Nutrition Units").

After reading the items referring to the sustainability criteria developed by these studies, duplicated items were excluded and the most suitable ones to the reality of school feeding were chosen. This screening resulted in the choice of 34 items/questions with the following possible answers: "no", "yes" and "intend to". Those 34 questions were particularly chosen because of their correspondence to the criteria/aspects related to the dimensions of sustainable diets shown in table 1. The criteria in the table are based not only on the studies used for the development of this instrument, but also on existing literature on sustainable diets and different methodologies to measure its different dimensions.[14,15]

Chart 1. Criteria to assess sustainability actions by PNAE nutritionists in southwestern and western Paraná, 2021.

Criteria	Aspects considered
Nutritional	Nutrition calculation; Less frequent offer of animal protein; Offer of vegetarian options.
Food production	Purchase of family farming food; Purchase of organic products; Geographical distance; Purchase of seasonal food; Use of genetically modified food (GMO).
Socio-cultural	Purchase of family farming food; Geographical distance; Respect to the local food culture; Use of Unconventional Food Plants (PANCS); Sensory aspects.
Environmental	Purchase of organic products; Geographical distance; Offer of animal protein with less frequency; Purchase of seasonal food; Vegetarian or ovo-lacto vegetarians options; Educational actions.
Biodiversity	Use of PANCS; Use of genetically modified food (GMO); Respect to local food culture; Variety of food/meals.

Chart 1. Criteria to assess sustainability actions by PNAE nutritionists in southwestern and western Paraná, 2021.

Garbage	Avoids purchasing food in small and individual packages; Selective garbage collection; Recycles or donates/reuses materials; Reuses or recycling of cooking oil; Use of leftover food scrap for composting or animal feeding; Reduced use of disposable materials (disposable cups and napkins, water plastic bottles, straws).
Waste	Use of Kitchen Prep Sheet (FTP, as its acronym in Portuguese) Use of vegetable peels and stems as meals ingredients; Monitoring of food waste; Priority to receiving adequate quantities according to per capita rate and number of meals planned; Control of leftover/intake; Performance of acceptability tests; Performance of educational sustainability awareness actions to diners.
Energy Use	Use of economical and energy-efficient light bulbs – *light emitting diode* (LED); Use of automatic lighting with presence sensor; Use of equipment with energy-saving seals; Preventive maintenance of electrical equipment; Use of renewable energy; Control and maintenance of food storage areas regarding temperature and ventilation; Provision of courses and training to educate employees about sustainability in food production.
Water Use	Automatic faucets with water or flow controller for rational use of water; Use of a cistern to use rainwater harvested; Use of biodegradable cleaning products; Proper wash of fruits and vegetables with sustainable sanitizing products, using water rationally, and; Courses or training to educate employees about sustainability in food production.

The authors created a general score for sustainability actions based on these 34 criteria. All "yes" answers scored one point; the "intend to" answers score two points; and the "no" answers score three points. Thus, the lower the score, the more sustainable actions were carried out or intended by nutritionists.

With regard to knowledge, four questions were prepared addressing their training (if they had classes/curriculum components on aspects related to sustainability and sustainable food/diets), their knowledge about sustainable diets, whether they considered this knowledge to be sufficient and, in case of knowing about it, the information source.

Regarding the importance given by the professionals to the different sustainability dimensions, five questions were asked about each of these dimensions: nutritional, social, economic, cultural and environmental, and possible answers were "very important", "moderately important", "slightly important", and "not important".

Data were tabulated in Excel and transferred to the PSPP statistics software, which was used to perform descriptive analyses, namely Kolmogorov Smirnov test (to identify the type of distribution of quantitative variables) and the Mann Whitney test. This research was approved by the Ethics Committee for Research with Human Beings at UFFS (Universidade Federal da Fronteira Sul), under protocol number 28972919.3.0000.5564.

RESULTS

Out of the 96 questionnaires sent, 32 were answered (33.33%). According to table 1, the majority of respondents had no academic training on sustainable diets and considered that they did not have sufficient knowledge about the subject.

Table 1. Academic training and knowledge about what sustainable diet is and its aspects among nutrition professionals – southwestern and western Paraná, 2021.

VARIABLE	YES N° (%)	NO N°(%)
Classes/curriculum activities on sustainability and nutrition/sustainable diets issues	12 (37.5)	20 (62.5)
Knowledge about sustainable diets	31 (87.5)	3 (12.5)
Sufficient knowledge about sustainable diets	7 (21.9)	25 (78.1)

Source: The authors (2021).

Table 2 shows that all nutritionists answered that they give high or moderate importance to all the sustainability dimensions assessed. No one responded "slightly important" or "not important" to any of the items. However, environmental issues were the ones that had the lowest percentage of responses as a very important dimension when compared to the others.

Table 2. Verification of the level of importance nutritionists give to each aspect of sustainable diets when planning the menu – southwestern and western Paraná, 2021.

VARIABLE	Very Important N (%)	Moderately Important N (%)
Nutritional aspects	29 (90.6)	3 (9.4)
Social aspects	30 (93.8)	2 (6.3)
Environmental aspects	24 (75.0)	8 (25.0)
Cultural aspects	28 (87.5)	4 (12.5)
Economical aspects	27 (81.3)	5 (15.6)

Source: The authors (2021).

Table 2 shows the percentage of professionals who carry out the actions suggested as sustainability criteria in the research instrument. Out of the 34 actions presented, 11 are carried out by 76 to 100% of respondents in their municipalities. However, another nine actions were mentioned by less than 25% of respondents as currently completed. Out of these nine actions, eight were mentioned by more than 50% of nutritionists as future intentions. The only action mentioned by only 28% of nutritionists as a potential future action was the purchase of organic products. In this regard, 50% said they did not buy and did not intend to buy such products.

Chart 2. Percentage of statements by nutritionists about current actions regarding sustainability – southwestern and western Paraná, 2021.

76 – 100%	51 – 75%	26 – 50%	00 – 25%
Purchase food directly from Family farmers (100%)	Monitor food waste (65.6%)	Perform nutritional calculation of menus in accordance with PNAE regulations (50%)	Purchase organic products (21.9%)
Prioritize the purchase of foodstuffs produced within the shortest distance possible (100%)	Control and maintain food storage areas regarding temperature and ventilation, according to legislation standards (56.3%)	Avoid purchasing genetically modified food (GMO) (50 %)	Offer vegetarian or ovo-lacto vegetarian options on the menu (18.8%)
Seek to respect the local food culture (100%)	Perform courses or training to educate employees about sustainability in food production (56.3%)	Perform preventive maintenance of electrical equipment (43.8%)	Include PANCs (Unconventional Food Plants) as ingredients in the menu preparations (15.6%)
Care about the sensory aspects of the meal (100%)	Use economical and energy-saving light bulbs (LED – *light emitting diode*) (56.3%)	Dispose of leftover food scraps for compost or animal feed (43.8%)	Have a cistern to reuse rainwater (12.5%)
Seasonality (96.9%)	Restrict the use of beef dishes in the menu to less than twice a week (53.1%)	Monitor the leftovers/intake (40.6%)	Choose biodegradable cleaning products (12.5%)
Prioritize receiving adequate quantities according to per capita rate and number of meals planned (93.8%)	Prepare and offer safe meals using vegetable peels and stems as ingredients (53.1%)	Recycle or donate/reuse materials. (34.4%)	Use automatic faucets with water or flow controllers for rational use of water (9.4%)
Perform acceptability tests (87.5%)		Periodically perform educational actions to raise sustainability awareness of students, focusing on, (34.4%)	Use automatic lighting system with presence sensors (6.3%)
Properly wash fruits and vegetables with sustainable sanitizing products, using water rationally (87.5%)		Use Kitchen Prep Sheet (FTP) (28.1%)	Purchase recycled materials (6.3%)
Perform selective garbage collection (84.4%)			Use some type of renewable energy (3.1%)
Reduce the use of disposable containers (water plastic bottle, straws) by prioritizing reusable or recyclable materials (81.3%)			
Avoid purchasing food in small, individual packages (81.3%)			

Source: The authors (2021).

Finally, table 3 presents the relationships between the scores of sustainability actions along, the questions about the importance given to each dimension regarding menus and nutritionists' knowledge about sustainable diets.

Table 3. Relationship between sustainable actions and level of the importance of different aspects considered in the menus preparation and nutritionists' self-reported knowledge about sustainability – southwestern and western Paraná, 2021.

	N	Mean score of sustainability actions	p (M-W)
Level of importance of aspects considered in the menus preparation			
Nutritional aspects			
Very important	29	58.03	0.218
Moderately important	03	63.00	
Social aspects			
Very important	30	58.53	0.845
Moderately important	02	58.00	
Environmental aspects			
Very important	24	58.96	0.407
Moderately important	08	57.13	
Cultural aspects			
Very important	28	58.00	0.376
Moderately important	04	62.00	
Economical aspects			
Very important	27	57.04	0.004
Moderately important	05	66.04	
Knowledge about sustainable diet			
Classes/curriculum activities on the topic			
Yes	12	57.42	0.572
No	20	59.15	
Knowledge about sustainable diets			
Yes	28	58.29	0.627
No	4	60.00	
Sufficient knowledge about sustainable diets			
Yes	7	59.57	0.664
No	25	58.20	

Source: The authors (2021).

DISCUSSION

Regarding nutrition professionals' knowledge about what a sustainable diet is, most (87.5%) consider they do not have sufficient knowledge about sustainable diet and that during their undergraduate course they did not have curriculum components related to sustainability, which is consistent with other studies in the area. According to Jacob & Araujo,[16] the possible gaps found in the training of nutritionists refer to the development of skills to work in the context of the Secretaria de Atenção à Saúde ("Secretariat of Health Care") and Food and Nutrition Security (FNS), and the professional and educational deficiencies when addressing systemic issues. This is in line with the arguments of Naves & Recine[17] on the hypothesis that, although declared as important, the nutritionists' professional performance related to sustainability is still underdeveloped, indicating the need for changes in training and professional performance.

When investigating the approach to sustainability in the curricula of Nutrition undergraduate programs in Brazil, Jeronimo[18] related Higher education institutions (HEIs) to subjects including sustainability, ecology, environment,

environment and ecosystem. Among the 42 curriculum matrices analyzed, only 32.5% contained sustainability-related topics. According to the study,[18] there were few Nutrition curricula with subjects focused on environment. However, there is an effort by institutions to address the topic during undergraduate studies.

This may be related to the importance that professionals give to the environmental aspect of diets. When verifying the level of importance they give to the different dimensions (nutritional, economic, cultural, social and environmental), this study showed that, among them, the environmental aspect had the lowest percentage of "very important" answers (75%). The best rated dimension was social, with 93.8% of mentions as a very important aspect, followed by nutritional (90.6%). Another positive finding was that none of the participants reported giving little or no importance to any of the dimensions. These results point to an increasingly evident concern of these professionals with the Food and Nutritional Security of their audience, especially as the social dimension appears with a high percentage of "very important" responses, even higher than nutritional aspects.

A study that investigated criteria used in the preparation of the school food menu in 21 Brazilian municipalities[9] identified that the nutritional aspects of the menu, respect for eating habits, and the supply of family farming products were the main points considered, indicating compliance with the regulations in the PNAE.

Thus, it was found that the most common actions by nutritionists in this study are included in legislation and rationalize resources. Examples of actions performed very often (more than 76% of mentions) include the purchase of family farming (FF) products, the search for more local and seasonal foods, respect for food culture, attention to the acceptability of the meals served to avoid waste, preference for non-disposable materials, and purchase of products in larger packages.

Regarding food purchases from FF, this has been a legal obligation that must be complied with by all PNAE Executing Entities (EE) since 2009 (Law nº 11947/2009, Article 14[7]). This legal requirement leads to purchases of local products (since the local family farmers from the municipality or region must be prioritized) and seasonality, as most of the foodstuffs are fresh or minimally processed. The legislation can also be used here as an argument for the cultural dimension and adherence to acceptability tests by nutritionists.

As described in Art. 19 of Law No. 11.947/2019, care with food quality must be taken, particularly with regard to hygiene and acceptability of the menu options offered.[7] Also, according to Resolution No. 06/2020,[6] Art. 20, an acceptability test with students must be performed whenever new food is introduced to the menu or any other innovative changes occur in terms of preparation. Such requirement addresses the acceptance of menus frequently offered in terms of respect for eating habits and also for waste control.

Among the actions mentioned by more than 50% of nutritionists, many of them have to do with economy or the rational use of resources, such as monitoring of waste, use of energy-saving bulbs, ventilation and temperature control, use of peels and stems, and lower frequency of beef. Among actions mentioned by 26-50%, some of them require more investment of resources and time from professionals, such as the calculation of menus, preparation of technical sheets, control of leftovers/ingestion, recycling, and composting. With regard to purchases of GMO products, only half of the sample avoids them, which can be explained by the fact that similar non-GMO items are relatively more expensive.

Finally, among the less frequent actions, it was found that some require investment in materials and structures (use of cisterns, renewable energy, automatic faucets, purchase of organic products) and others involve cultural/economic aspects, such as vegetarian menu options and the offer of Unconventional Food Plants (PANCs). In these cases, not only would it be necessary to have a greater discussion with the nutrition managers and others involved, but also the sensitiveness of parents and students, as these actions demand changes in eating habits and environmental awareness.

Sousa et al.[8] revealed that, although it may still be linked to the conventional agrifood system, the choice of seasonal menus that considers the diversity of regional foods with specific sanitation rules and the mapping of ecological

farmers are actions that can orient the demand and scheduled supply of these foods beyond all the advances in menu preparation to date. Also, connecting school menus to sustainability elements requires facing some challenges such as purchasing and logistics management, demanding government support for the Program, fostering its social control by different actors in the school community, and promoting awareness and continuing education for technicians and professionals involved in school meals, as well as experts in academia.[8]

Regarding vegetarian menus, an exploratory study by Lacerda[19] analyzed the Meat Free Monday project ("*Segunda Sem Carne*") at the Faculdade de Saúde Pública (Faculty of Public Health of USP) and found that 78% of the participants said they liked the project. In Brazil, Meat Free Monday first arrived in cities in the State of São Paulo, and there have been actions to introduce it in the state education system since 2015.[20]

Regarding PANCs in school meals, Roxana[21] gave some lectures and short courses to promote environmental education activities and encourage public schools to use PANCs, and she reported in her research that most students do not know PANCs. Therefore, more activities on the subject are needed to value and include these plants in environmental care actions.

Another important aspect is the purchase of organic products, as 50% of the sample said they did not buy or did not intend to. In a study carried out in the State of Santa Catarina,[22] it was found that 60% (n=160) of its 293 municipalities purchased food from family farming and, out of these, only 17.7% (n=52) purchased organic food, which indicates a low adherence to this type of product by the PNAE.

Another study carried out in southwestern Paraná found that purchases of these products were affected due to the lack of production, certification, interested farmers and also nutritionists' budget limitations to buy them, given the prices difference compared to non-organic ones.[23] Explanations offered in the literature about the high cost of organic food are, according to Darolt,[24] packaging costs, small production scale, production drop in the winter months (due to recurring weather problems), poor organization of the production system and marketing process, logistical and distribution difficulties, little research on organic farming, additional costs with certification, and economic losses during the transition from conventional to organic culture.

It is worth mentioning that non-organic production receives more subsidies compared to organic/agroecological production, which ultimately encourages the use of pesticides.[25] However, despite these difficulties, there is a law in the State of Paraná (Law no. 16751/10)[26] which plans to have all state schools purchase 100% of organic products for school meals by 2030.

The last specific goal of this study was to verify how the variables on knowledge and importance given to the dimensions of sustainability relate to the professionals' actions scores. There were no significant differences between nutritionists with more training and knowledge about sustainable diets and the number of actions towards sustainability they carry out in schools.

Regarding the importance given to each sustainability aspect when preparing the menu, the only variable that showed a significant relationship with a greater number of actions was the level of importance given to the "economic" dimension. Nutritionists who considered it a very important aspect carried out more sustainability actions than those who considered it moderately important. As explained above, many of the actions carried out refer to the rational use of resources, by saving materials and inputs and making better use of them. The less frequent actions among professionals were closely related to those that require investments in infrastructure or more work and money, even if they could result in lower costs of energy, materials and public health in the future. Therefore, professionals who carry out more sustainable actions tend to be seemingly more concerned with economic aspects in the short term than with environmental aspects and sustainability in the medium and long term.

This finding leads to discussions on the role of the State in using its food programs to promote sustainability or, in Morgan & Sonnino's[27] words, a "Green State". Following these considerations, the authors argue that sustainable development means integrating environmental pemises into economic development strategies, assuming that effective environmental protection needs economic development, and successful economic development depends on environmental protection. The authors' approach is based on the idea that, in theory, school feeding has much to contribute to current efforts to address the challenges of sustainable development. By definition, it is one of the few public services that specifically target "future generations".

These reflections by Morgan & Sonnino[27] reveal that the PNAE needs to be enhanced in terms of sustainability actions. Considering the limited resources directed to its execution and the nutritionists' limited (although increasing) knowledge and training on sustainability (and consequently, the importance given to environmental issues), the actions are still very limited to economic and legal factors. Such actions are poorly linked to environment-related practices, which are perhaps initially more costly and laborious, but which in the future would require lower environmental costs and less public resources. Investing in the environmental aspect of sustainable diets in school feeding primarily means ensuring the program continues to be an FNS instrument and future generations become more aware of their health and the planetary health.

CONCLUSION

Through this research, it was found that the nutritionists responsible for the PNAE still have training weaknesses when it comes to sustainability issues. Thus, this study indicates the need for training and raising awareness of these professionals about sustainable diets, so that they enhance their understanding of what the topic encompasses and have more clarity about the actions they must take to achieve sustainability.

The level of importance given to environmental aspects is not as high as the other dimensions of sustainable diets, which may be explained by how little this is explored in the Nutrition field. In addition, the actions actually carried out appear to be closely related to the economic aspect, and not so much to environmental concerns, which reinforces the concern to stay within the Cities' budgets and its impact on issues such as the purchase of organic products, to mention an example.

Therefore, incentives through public policies are important, as well as greater investment in school feeding, so that this Program can be a tool for public health and practices that benefit society and the environment. Greater investment in prevention, health and environment protection may be relevant for the economy in these sectors in the future.

A limitation of this research is the sample, as only one third of the total number of the intended population responded the survey. With such low number of nutritionists, the data obtained do not allow for a more in-depth analysis on the subject, which hinder many of the statistical analyses. In addition, the instrument used still needs further evaluations to reach greater data security once it is validated.

Finally, more studies on this theme are needed so that more subsidies can be offered for professionals to increase their awareness and make their performance within programs such as school feeding more efficient in terms of health, social, economic, cultural, and, eventually, environmental outcomes.

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Contributors

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