



## THE NATIONAL SCHOOL FEEDING PROGRAM IN PUBLIC SCHOOLS

### *O Programa Nacional de Alimentação Escolar em escolas públicas municipais*

### *El Programa Nacional de Alimentación Escolar de escuelas públicas municipales*

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#### ABSTRACT

**Objective:** To characterize the National School Feeding Program (Programa Nacional de Alimentação Escolar – PNAE) in public schools, considering structural and procedural aspects and the acceptance of school meals. **Methods:** Descriptive cross-sectional study of PNAE in 18 public schools in the urban area of Campina Grande, Paraíba, involving information about 85 teachers, 18 school cooks and 1081 students. Aspects related to the structure, activities complementary to the program, the profile of school cooks, teachers' knowledge about food and nutrition and acceptance of school meals were assessed using questionnaires and observation. **Results:** The structural conditions were rated as fair, with eight schools (44.44%) classified in this category. The refectory and the kitchen were pointed out as the most deficient areas. A deficit in activities complementary to the program was found; only two schools (11.11%) had school gardens and five (27.77%) developed health and nutrition activities. School cooks showed a profile suitable to the profession. Regarding teachers' knowledge, the identification of nutritional characteristics of foods was the main failure observed. Rejection and nonadherence to school meals were estimated around 25% and 35% of the students, respectively. **Conclusion:** Structural and procedural failures in the implementation of PNAE need to be resolved in compliance with the current law. There are deficiencies in the refectory, in the kitchen and in the development of educational activities. In addition, school gardens were scarce. Improvements in these conditions can have a positive impact on acceptance and adherence to school meals by the students.

**Descriptors:** Nutrition Programs and Policies; School Feeding; School Health.

#### RESUMO

**Objetivo:** Caracterizar o Programa Nacional de Alimentação Escolar (PNAE) em escolas públicas municipais, considerando aspectos estruturais, processuais e a aceitação da alimentação. **Métodos:** Estudo transversal e descritivo do PNAE em 18 escolas públicas da zona urbana de Campina Grande, Paraíba, envolvendo informações relativas a 85 professores, 18 merendeiras e 1.081 escolares. Analisaram-se, por meio de questionários e da observação, aspectos sobre a estrutura, as atividades complementares do programa, o perfil das merendeiras, os conhecimentos sobre alimentação e nutrição dos professores e a aceitação da alimentação escolar. **Resultados:** As condições estruturais tiveram avaliação média regular, estando oito escolas (44,44%) classificadas nessa categoria e sendo os itens refeitório e área da cozinha os mais deficitários. Constatou-se um déficit de ações complementares ao programa; apenas duas escolas (11,11%) tinham horta escolar e cinco (27,77%) desenvolviam atividades de saúde e nutrição. Entre as merendeiras, destacou-se um perfil adequado ao exercício da profissão. Na avaliação dos conhecimentos dos professores, a identificação das características nutricionais dos alimentos foi a principal falha constatada. A rejeição e a não adesão à alimentação escolar foram estimados em torno de 25% e 35% dos escolares, respectivamente. **Conclusão:** Apontam-se falhas estruturais e processuais na execução do PNAE que precisam ser sanadas em cumprimento às leis vigentes. Destacam-se deficiências no refeitório, na cozinha e no desenvolvimento de atividades educativas. Além disso, hortas escolares foram escassas. Melhorias nessas condições podem repercutir positivamente na aceitação e adesão dos escolares à alimentação escolar.

**Descritores:** Programas e Políticas de Nutrição e Alimentação; Alimentação Escolar; Saúde Escolar.



## RESUMEN

**Objetivo:** Caracterizar el Programa Nacional de Alimentación Escolar (PNAE) de escuelas públicas municipales considerando los aspectos de estructura, proceso y aceptación de la alimentación. **Métodos:** Estudio transversal y descriptivo del PNAE de 18 escuelas públicas de la zona urbana de Campina Grande, Paraíba, con informaciones de 85 profesores, 18 mujeres que hacen meriendas y 1.081 escolares. Se analizaron los aspectos de estructura, las actividades complementares del programa, el perfil de las mujeres que cocinan meriendas, los conocimientos sobre la alimentación y nutrición de los profesores y la aceptación de la alimentación escolar a través de cuestionarios y observación. **Resultados:** Las condiciones estructurales tuvieron evaluación media regular con ocho escuelas (44,44%) clasificadas en esa categoría y los ítems de comedor y área de la cocina fueron clasificados como los más deficitarios. Se constató un déficit de las acciones complementarias del programa; solamente dos escuelas (11,11%) tenían huerta en la escuela y cinco (27,77%) desarrollaban actividades de salud y nutrición. Se destacó un perfil adecuado para el ejercicio de la profesión entre las mujeres que hacen las meriendas. En la evaluación de los conocimientos de los profesores, la identificación de las características nutricionales de los alimentos ha sido la principal falla encontrada. El rechazo y la no adhesión para la alimentación de la escuela fueron estimados en el alrededor del 25% e 35% de los escolares, respectivamente. **Conclusión:** Las fallas de estructura y de procesos para la ejecución del PNAE necesitan ser arregladas para cumplir las leyes vigentes. Se destacan las deficiencias del comedor, de la cocina y del desarrollo de las actividades educativas. Además, las huertas de las escuelas fueron escasas. Las mejorías de esas condiciones pueden repercutir de manera positiva para la aceptación y adhesión de los escolares para la alimentación de la escuela.

**Descriptor:** Programas y Políticas de Nutrición y Alimentación; Alimentación Escolar; Salud Escolar.

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## INTRODUCTION

The Brazilian National School Feeding Program (*Programa Nacional de Alimentação Escolar - PNAE*) is one of the world's largest school feeding programs<sup>(1)</sup>. It stands out as one of the oldest and most permanent governmental interventions in regard to the social policies of food and nutrition, according to the principles of Human Right to Adequate Food and the Food and Nutrition Security<sup>(2-4)</sup>.

According to the legislation, PNAE's main objective is to "contribute to the biopsychosocial growth and development, learning, school performance, and formation of healthy eating habits of the students, by means of actions of food and nutrition education and meals that cover their nutritional needs during the school year"<sup>(5)</sup>. Menu planning, therefore, should contemplate the food preferences of the schoolchildren, with acceptance above 85%, according to the Hedonic Scale, and above 90% for leftover ingestion<sup>(3,5)</sup>.

In addition to the National Fund for School Development (*Fundo Nacional de Desenvolvimento Escolar - FNDE*), which is responsible for the coordination of the PNAE, the executing units and the School Feeding Councils (*Conselhos de Alimentação Escolar - CAE*) are essential institutions for the proper functioning of the program. Teachers, nutritionists and school school cooks are fundamental for the development of food and nutrition education actions. The essentialness of the physical structure and equipment available in the kitchens is also highlighted<sup>(3,5,6)</sup>. However, there is a shortage of studies on management approaches and the involvement of professionals in the program<sup>(3)</sup>.

The food offered by PNAE is fundamental for students, since most of them live in a situation of social vulnerability, so that it grants an articulated social value to eating and reduces the deprivation experienced<sup>(7,8)</sup>. Socially recognized as a locus of learning, the school acts as a privileged space and fertile ground for implementing educational actions of health and nutrition promotion<sup>(7,9)</sup>.

The present study aimed to characterize the National School Feeding Program in municipal public schools, considering structural and procedural aspects, and food acceptance.

## METHODS

The present study is linked to the project "Nutritional status and National School Feeding Program: profile in the context of municipal public schools of Campina Grande, PB, for the development of a Program to fight hunger and malnutrition." This is a descriptive, cross-sectional, PNAE-related research developed in the city of Campina Grande, Paraíba, Brazil.

The municipality of Campina Grande is located in the Agreste Paraibano mesoregion and has a total area of 641 km<sup>2</sup>, with 51 districts and five boroughs (three rural and two urban ones). It has urban and rural population of, respectively, 337,484 and 17,847 inhabitants.

At the time of data collection, in September 2013, a Municipal Education Secretariat had 120 elementary schools (1st cycle) serving 5- to 10-year-old children, distributed in the 1st to 5th grade classes. There were 86 schools in the urban zone (nine nuclei) and 34 in the rural area (four nuclei), serving, respectively, 21,696 and 2,801 schoolchildren. The eligible population

includes all 1,754 schoolchildren aged 5 to 10 years in urban schools (342 enrolled in the first year, 341 in the second year, 348 in the third year, 346 in the fourth year and 377 in the fifth year).

For the study, two schools for each urban area nucleus (18 schools) and one class each year per school (90 classes) were drawn. All the teachers responsible for the drawn classes participated in the study (85 teachers - in five cases, the teacher of different classes was the same).

Students outside the age range were excluded from the study (among first-year students, those under five years of age; and those over 10 years of age who were in the fifth year), as well as those with physical problems that made the anthropometric assessment difficult. There were losses related to school absence on the day of data collection and due to difficulties in the anthropometric assessment. Children with no information about acceptance of school meals were also excluded from the database. The flowchart of selection the of research subjects is shown in Figure 1.

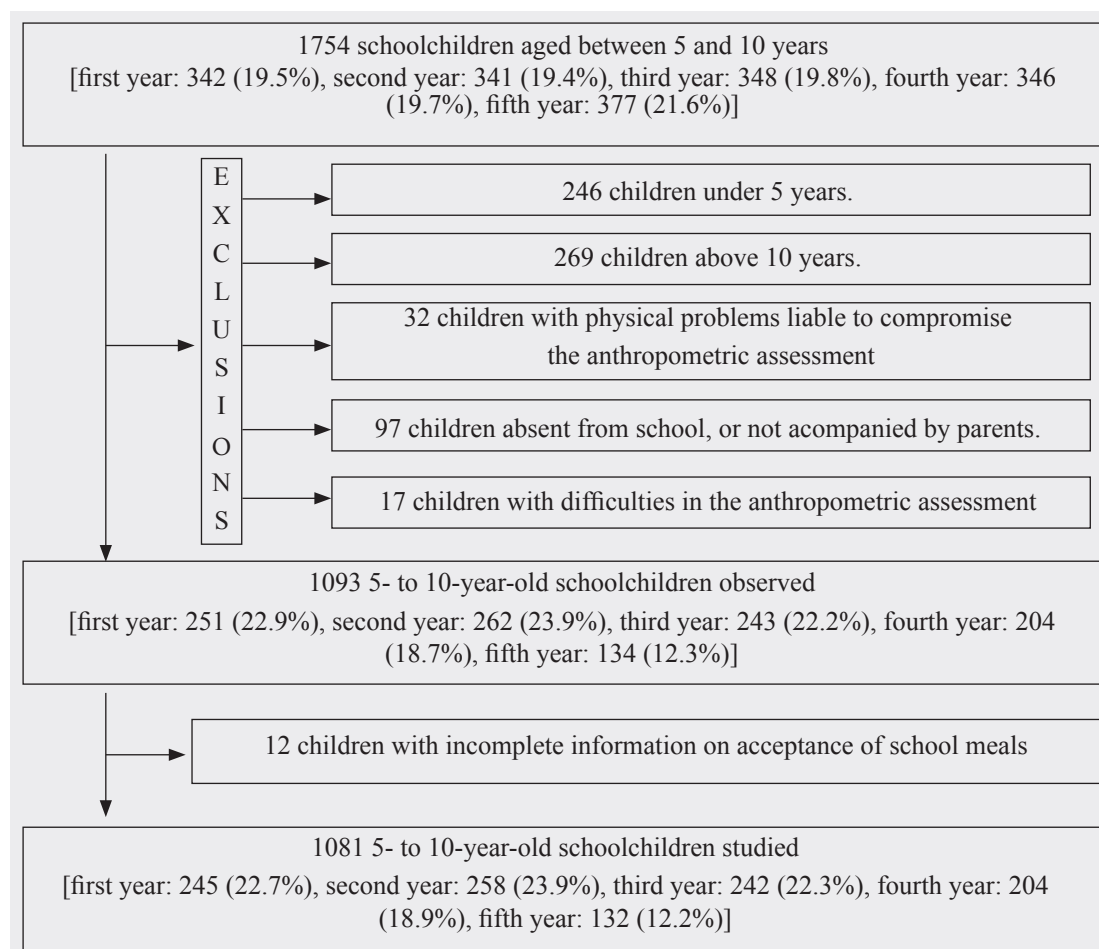


Figure 1 - Flowchart for population selection of the study on the National School Feeding Program. Campina Grande, Paraíba, Brazil, 2013.

The data were collected by a team of undergraduate and graduate students from the health area of the State University of Paraíba, trained by the project coordinator. PNAE characterization addressed information on the school feeding processing capacity, cooking conditions, activities complementary to the program, profile of school cooks, teachers' knowledge of food and nutrition, and acceptance of school meals<sup>(10)</sup>.

The school feeding processing capacity integrated the analysis of eight criteria obtained by observation: existence of a school cook; kitchen area; conditions of main equipment (stove, refrigerator, freezer) and auxiliary equipment (blender, mixer); and the availability of cooking utensils, serving utensils, refectory and pantry. All the criteria admitted answers with values of 0 (negative evaluation), 1 (evaluation indicating some impairment), or 2 (positive evaluation). Depending on the functioning condition of the equipment, the criterion "main equipment" also admitted values of 0.5 (when all the equipment did not exist

and one of them had malfunction) and 1.5 (when all equipment was available, though one piece had malfunction). The school feeding processing capacity was rated according to the total score: < 8 (unsatisfactory), 8-12 (regular), 13-16 (satisfactory).

For characterization of integrated activities complementary to PNAE, the parameters of interest were the existence of a school garden, development of health and nutrition activities in classrooms or in the school environment, participation of parents and community, development of health activities through partnerships, and supervision of school feeding. For these purposes, teachers and school principals answered a questionnaire with “Yes” or “No” as possible responses.

In order to describe the professionals’ profiles, all the school cooks were characterized, one for each school, as well as the teachers’ knowledge of food and nutrition. The questionnaire to delineate the school cooks’ profile, based on a previous study<sup>(10)</sup>, considered being in other job position (yes or no), the reason for being in this job position (by free choice or need for work), the relish for being a school cook or not), participation in training in nutrition and food hygiene and menu planning (yes or no), and the interest in attending training classes for their improvement as a school cook (yes or no).

The teachers’ knowledge of food and nutrition was evaluated through the application of a questionnaire prepared by the researchers, containing basic questions related to the subject, with two alternative answers (yes or no). The questions asked whether food provides energy and nutrients; if energy and nutrients are needed for children’s growth, development and health; if proteins, carbohydrates, fats, vitamins and minerals are the same as food; if proteins, carbohydrates, fats, vitamins and minerals are nutrients; if vitamins and minerals are needed in larger amounts than proteins, fats and carbohydrates; if iron is important for blood; if calcium and fluoride are important to the teeth, but not to the bones; if protein-rich foods are the main source of energy; if citrus fruits are foods rich in vitamin C, while dark green leafy vegetables and legumes are rich in vitamin A and B complex vitamins; if foods like red meat, fish, peanuts and beans are important sources of protein and iron, while rice and sugar are rich in iron only.

Acceptance of school feeding included information related to the school children’s perception of it (good, fair or poor), daily frequency of consumption (yes or no), and foods with the highest rejection (open-ended question). They were also asked about the habit of taking money to school (yes, no, or sometimes) and the food bought with it (open-ended question).

The data was entered in Microsoft Excel spreadsheets (Microsoft Inc., United States) with formatting and validation options for error reduction. A random sample of 1/3 of the data was submitted to the consistency check, considering the information contained in the questionnaires, with discrepancies found and corrected in eight of the questionnaires applied to students. The data were processed and summarized by means of frequency, which were calculated through software R version 3.1.2.

The research project was approved by the Research Ethics Committee of the State University of Paraíba and obtained the written consent of the professionals and the children’s parents or guardians.

## RESULTS

The results related to the school feeding processing capacity are shown in Table I. The average evaluation was regular, with eight schools (44.44%) rated in this category. The items “refectory” (mean=0.83) and “kitchen area” (mean=1.11) were the most compromised ones, while “cooking utensils” (mean=2.0) and “school cooks” (mean=1.94) presented the best evaluation.

Table I - School feeding processing capacity in municipal public schools. Campina Grande, Paraíba, 2013.

Schools	Evaluation criteria								Score	Evaluation
	I	II	III	IV	V	VI	VII	VIII		
A	2	2	1.5	2	2	2	2	2	15.5	Satisfactory
B	2	1	2	2	2	2	0	2	13	Satisfactory
C	2	0	2	2	2	2	2	1	13	Satisfactory
D	2	1	1.5	1	2	2	2	1	13.5	Satisfactory
E	2	2	2	2	2	2	0	2	14	Satisfactory
F	2	1	1.5	1	2	2	2	1	11.5	Regular
G	2	1	2	2	2	2	0	2	13	Satisfactory
H	2	1	2	2	2	2	1	1	13	Satisfactory
I	2	1	2	1	2	2	0	2	12	Regular
J	2	0	1	2	2	2	1	2	12	Regular
K	2	2	2	2	2	2	0	2	14	Satisfactory
L	2	1	1.5	1	2	2	0	2	11.5	Regular
M	2	1	2	1	2	1	0	2	12	Regular
N	2	1	1	1	2	2	2	2	13	Satisfactory
O	2	1	1.5	2	2	2	0	2	11.5	Regular
P	2	2	1.5	1	2	1	1	1	11.5	Regular
Q	2	0	1.5	2	2	2	0	0	9.5	Regular
R	1	2	1.5	1	2	2	2	2	13.5	Satisfactory
Schools (mean)	1.94	1.11	1.66	1.61	2.00	1.88	0.83	1.61	12.64	Regular

I - School cooks / II - Kitchen area / III - Main equipment / IV - Auxiliary equipment / V - Cooking utensils / VI - Serving utensils / VII - Refectory / VIII - Pantry. The evaluation criteria accepted values of 0, 1 or 2. The criterion "main equipment" also accepted values of 0.5 and 1.5, depending on the functioning condition of the equipment. Score: <8 (unsatisfactory), 8-12 (regular), 13-16 (satisfactory).

In relation to activities complementary to PNAE (Table II), there was evidence of deficiency, in general. Only two schools (11.11%) had school gardens and only five institutions (27.77%) mentioned developing health and nutrition activities. The participation of parents and the community was reported by six school principals or teachers (33.33%).

Table II - Complementary activities developed in the context of the National School Feeding Program (PNAE) of municipal public schools. Campina Grande, Paraíba, 2013.

Aspects evaluated	Positive Responses	
	n	%
School garden	2	11.11
Health and nutrition activities in the classrooms*	5	27.7
Parent and community involvement	6	33.33
Health activities through partnerships**	9	50.0
Supervision***	13	72.22

\* All teachers who responded positively reported performing educational activities related to the importance of adequate nutrition/food consumption, and only two incorporated also the children's anthropometric assessment.

\*\* In all cases of positive responses, the partnerships referred to joint work with professionals from family health units, of which two schools also indicated a partnership with one of the public universities located in Campina Grande.

\*\*\* Of the 13 schools where the professionals reported the existence of supervision of school feeding, nine cited the involvement of nutritionists; eight, the School Feeding Council; six, the Municipal Secretariat of Education and four, the School Board.

All 18 school cooks interviewed had been in the position for at least six months. Of these, six reported serving in another position as well. Regarding training, fifteen (83.33%) reported having participated in training courses in nutrition and food hygiene, and ten (55.55%) in menu planning (Table III).

Table III - Profile of the school cooks of municipal public schools. Campina Grande, Paraíba, 2013.

Aspects evaluated	Positive responses	
	n	%
Not being in other job position	13	72.22
Being in this job position by free choice	9	50.0
Relish for being a school cook	17	94.44
Participation in training in nutrition and food hygiene	15	83.33
Participation in training in menu planning	10	55.55
Interest in attending training classes*	17	94.44

\* Most cited training courses: Nutritional value of food (n=6); menu planning/food preparation (n=4); food waste reduction (n=3); food hygiene and handling (n=2); and food storage, preservation and freezing (n=2).

The frequencies of correct answers to the questions on feeding and nutrition answered by the teachers are given in Table IV. It is observed that the recognition of the importance of energy and nutrients for children's growth, development and health (100%, n=85); the identification of food as a source of energy and nutrients (98.82%, n=84); and the establishment of the role of iron in the blood (98.82%, n=84) were the items with the greatest number of correct answers. The questions with the least number of correct answers were those related to protein-rich foods as the main source of energy (47.06%, n=45); the greater need for vitamins and minerals than for proteins, fats and carbohydrates (41.18%, n=50); and whether foods represent the same thing as proteins, carbohydrates, fats, vitamins and minerals (30.59%, n=59).

Table IV - Proportion of correct answers given by teachers (n = 85) of municipal public schools on knowledge related to food and nutrition. Campina Grande, Paraíba, 2013.

Aspects evaluated	Correct answers	
	n	%
Food provides energy and nutrients	84	98.82
Energy and nutrients are needed for children's growth, development and health	85	100
Proteins, carbohydrates, fats, vitamins and minerals are the same as food	59	69.41
Proteins, carbohydrates, fats, vitamins and minerals are nutrients	78	91.76
Vitamins and minerals are needed in greater amounts than proteins, fats and carbohydrates	50	58.82
Iron is important for blood	84	98.82
Calcium and fluoride are important for teeth but not for bones	64	75.29
Protein-rich food is the main source of energy	45	52.94
Citrus fruits are foods rich in vitamin C, while dark green leafy vegetables and legumes are rich in vitamin A and complex B vitamins	77	90.58
Foods like meat, fish, peanuts and beans are important sources of protein and iron, while rice and sugar are rich in iron only	74	87.05

The results related to acceptance of school feeding showed that 75.02% (n=811) of the students considered it to be good, 23.13% (n=250) considered it regular and, for 1.85% (n=20), it was bad. Not eating the school meals every day was reported by 36.26% (n=392) of the schoolchildren. Soup (27.57%, n=298) and milk rice (11.29%, n=122) were the most cited items when asking the schoolchildren about the foods they dislike. The percentage of students who reported taking money to school was 57.50% (n=622), of which 8.29% (n=52) indicated always doing so, while 49.21% (n=532) take it at times. Of the children who claimed to take money to school, 45.41% (n=282) reported spending it on popcorn and 7.25% (n=45) on sweets or candies, which are the most mentioned options.

## DISCUSSION

Considering the evaluation of the school feeding processing capacity in the present study, it is important to highlight the evidence of structural problems that may compromise the quality of the food offered, given that the physical conditions are key to guaranteeing the production of safe food<sup>(11,12)</sup>. Positively, it should be emphasized the state of conservation and functioning of the equipment and utensils, indispensable for the quality of the food<sup>(11)</sup>, and the existence of school cooks, a precursor factor to well-being and school performance<sup>(13)</sup>.

Of the items listed in the technical specifications regarding the kitchen equipment and school refectory<sup>(14)</sup>, the schools of Campina Grande brought the refectory as the most deficient. This result differs from that found in municipalities of Santa Catarina<sup>(15)</sup>. Considering that the existence of a refectory represents not only a physical space for eating, but also for socialization between students and teachers<sup>(16)</sup>, the students of the present study experience conditions that may limit the interaction and development.

A study with a focus on public day-care centers in the same municipality did not verify the problems reported here in relation to insufficient areas of the kitchens<sup>(17)</sup>, and it should be explained why the structure of the schools is not consistent with those of day-care centers. Adequacy of the physical area of the kitchen is important because the sufficiency of space allows the separation of activities in order to avoid cross-contamination of food and the development of food-borne diseases<sup>(11,18)</sup>. Thus, the adequacy of the physical area of the analyzed schools should be considered a priority for the prevention of infectious diseases in the children attending them.

Complementary activities to PNAE, such as pedagogical gardens and experimental cooking workshops, are some of the strategies of food and nutritional education considered indispensable for schoolchildren's learning process, health status and quality of life<sup>(5)</sup>. In the Federal District, researchers found that more than 60% of schools that had a school garden used them as an educational space for promotion of healthy eating<sup>(19)</sup>. In the present study, only two schools presented this strategy and 16 did not develop any type of complementary activity, with possible compromise of food-related practices for health promotion. Furthermore, the development of gardens in the municipal schools is important to support nutritious and healthy feeding.

The articulation between health units and public schools is determined in the Health in School Program (PSE), which also encourages the promotion of healthy feeding and Food and Nutrition Security actions<sup>(20)</sup>. This type of partnership was reported only in half of the schools considered in this study, representing flaws in the actions of intersectoriality of the municipality, which are regarded essential and strategic for the effectiveness of the program<sup>(21)</sup>. These circumstances may lead to impairments for the student, from the point of view of health care and the ability to transform educational information into healthy behaviors.

The present study found the supervision of school feeding as a positive point in most schools (72.22%). The importance of this activity for the adequacy and improvement of the menu was reported by other researchers who found similar results<sup>(4)</sup>. However, deficiencies in the current study are suggested when schools were observed not in compliance with the legislation<sup>(5)</sup>, in regard to the quality of school feeding (in terms of hygienic conditions and acceptability by the School Feeding Councils), the accountability for menu planning, and the supervision by nutritionists. Deficiencies in the performance of the councils (CAE) and nutritionists in PNAE were recently systematized in the literature<sup>(21)</sup>.

With regard to the school cooks, the results highlighted the training in nutrition and food hygiene (83.33%) and in menu planning (55.55%), as well as the interest in food and nutrition issues (94.44%), with possible positive repercussions on the preparation and quality of meals<sup>(13)</sup>, in view of the direct connection between these professionals and school feeding<sup>(3,6)</sup>. Other studies<sup>(10,17,22)</sup> also verified the willingness among the school cooks to attend training, which should be emphasized, given the importance for integrating the educational team into health promotion activities<sup>(22)</sup>. It was also possible to observe, in the school cooks' profile, the appreciation for the profession, the pleasure in cooking and the affection for children, converging with previous studies<sup>(6,10,22)</sup>.

Despite the recognition of the teacher's important role in the nutritional education process of the students, due to their strategic position and daily contact with the students<sup>(23)</sup>, their knowledge of nutrition has been poorly addressed in the literature<sup>(24)</sup>. Through the results found, in addition to previous study that tested different intervention strategies in nutrition education with teachers<sup>(23)</sup>, the identification of the nutritional characteristics of foods is suggested as the main deficiency in teachers' knowledge. It is important to stress the relevance of training as a procedure for raising awareness and support for the adoption of healthy eating habits<sup>(24)</sup>, having PNAE as a privileged space for that<sup>(23)</sup>.

The acceptance and adherence to school feeding, in approximately 75% and 65% of the students of Campina Grande, respectively, are similar to the results verified through a literature review conducted for this purpose<sup>(25)</sup>. This study, in addition to highlighting the small number of works on the subject, indicated that the acceptance rates are mostly lower than those stipulated by the FNDE, which would be of 85% in the hedonic scale<sup>(5)</sup>. Both rejection and non-adherence should be carefully analyzed, having their reasons identified so that they could be remedied.

Soup is present on the vast majority of school menus all over the country. Evaluated with acceptance under 85% in different Brazilian regions<sup>(25)</sup>, it was also one of the foods with lower acceptance in the current study (27.57%). The rejection of soup among schoolchildren may be due to their custom of nocturnal family consumption<sup>(8)</sup>. This fact reinforces the idea of low adherence due to the inadequacy of school feeding to eating habits<sup>(8,25)</sup>.

As in the present study, other authors have observed the habit of taking money to school and buying nutrient-poor foods that compete with school feeding<sup>(10)</sup>. Such foods are marketed in the very school, or in nearby places, such as canteens, which may interfere with the adherence to school feeding and, consequently, affect the compliance with PNAE guidelines<sup>(5,10)</sup>. In this sense, schools should be concerned about foods sold to schoolchildren, supporting the healthy choices.

It is necessary to reinforce that acceptance and adherence to school feeding are related issues. In this sense, it stands out the importance of adapting the food offered in schools to the students' eating habits and cultural traditions, and elaborating tasty

and attractive preparations, in addition to the importance of nutrition education actions, which are essential to the promotion of healthy food options<sup>(9,25)</sup>. For these objectives to be achieved, the encouragement of the professionals involved<sup>(6,25)</sup>, the evaluation of food acceptance<sup>(25)</sup> and the nutritionist's role as the technical manager in the execution of the program<sup>(3,5,21,25)</sup> are essential conditions.

Possible limitations of the present study were related to the responsiveness of schoolchildren, especially regarding the acceptance of school feeding. Above all, younger children may not be fully aware of food preferences related to food served in school meals. The possibility of bias related to the questionnaires/answers of the professionals is recognized. Thus, the interpretation of these results should consider that they may be influenced by such suggestions.

Another limitation is the non-inclusion of a qualitative approach and items that would certainly allow a better understanding and completeness of the aspects evaluated in the program, such as the insertion of the nutritionist, the acquisition of foods from family farms, the implementation of the School Feeding Councils (CAE) and the preparation of menus. However, results on aspects related to the structure and complementary actions, such as school gardens and intersectoral and pedagogical activities, stand out and can influence the performance of PNAE.

## CONCLUSION

The present study pointed out structural and procedural flaws in the implementation of PNAE that need to be resolved in compliance with the current laws. There are deficiencies in the refectory, in the kitchen and in the development of educational activities. In addition, school gardens were scarce. Improvements in these conditions can have a positive impact on acceptance and adherence to school meals by the students.

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