FOOD AND NUTRITION IN COLLECTIVE HEALTH

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Assessment of energy adequacy of menus programmed for school meals

Avaliação da adequação energética dos cardápios programados para a alimentação escolar

Abstract

Introduction: The National School Feeding Program seeks, among other goals, to meet the nutritional needs of students of different teaching modalities during their stay in the classroom. *Objective:* To compare the estimated values for adequacy of the Total Caloric Value (VCT) of the school feeding menus of a municipality. *Methods:* The six teaching modalities of the municipality were included in the study, and 12 menus were analyzed, totaling 60 days, through two tables of centesimal food composition, in order to compare the differences in the values provided by each one of them. The values found were compared with the recommendations by teaching modality and age group of Resolution CD/FNDE nº 26/2013 and categorized as "adequate", "above" or "below" the recommended values. *Results:* Of the days analyzed by the IBGE table, five weeks (41.7%) were with the appropriate weekly VCT average for the value recommended by the FNDE. The average of the remaining weeks was above recommended (58,3%). Already according to TACO, no weekly average fit the FNDE. *Conclusion:* The evaluation of the menus revealed predominantly caloric values above those recommended for school feeding. Within this, the importance of the nutritionist in school feeding stands out and, in this case, in the evaluation of the program, which requires respect for the local food culture, but also the approach of food as an educational strategy.

Keywords: School feeding. Menu planning. Recommended dietary allowances.

Resumo

Introdução: O Programa Nacional de Alimentação Escolar busca, entre outros objetivos, atender às necessidades nutricionais dos escolares das diferentes modalidades de ensino durante sua permanência em sala de aula. *Objetivo:* Comparar os valores estimados para adequação do valor calórico total (VCT) dos cardápios da alimentação escolar de um município. *Métodos*: Foram incluídas no estudo as seis modalidades de ensino do município, e foram analisados 12 cardápios, totalizando 60 dias, através de duas tabelas de composição centesimal de alimentos, a fim de comparar as diferenças existentes nos valores fornecidos por cada uma delas. Os valores encontrados foram comparados com as recomendações por modalidade de ensino e faixa etária da Resolução CD/FNDE nº 26/2013 e categorizados em "adequado", "acima" ou "abaixo" da recomendação. *Resultados:* Dos dias analisados pela tabela do IBGE, cinco semanas (41,7%) estavam com a média semanal do VCT adequada para o valor preconizado pelo FNDE. A média das semanas restantes ficou acima do recomendado (58,3%). Já de acordo com a TACO, nenhuma média semanal

se adequou ao FNDE. *Conclusão:* A avaliação dos cardápios revelou predominantemente valores calóricos acima daqueles preconizados para a alimentação escolar. Sobressai-se assim a importância do nutricionista na alimentação escolar e, neste caso, na avaliação do programa, que requer respeito à cultura alimentar local, mas também a abordagem da alimentação como estratégia educacional.

Palavras-chave: Alimentação escolar. Planejamento de cardápio. Recomendações nutricionais.

INTRODUCTION

The National School Nutrition Program (PNAE) aims, among other objectives, to address the nutritional requirements of students in the different areas of schooling during their permanence in school. It thus contributes towards the growth, development, learning and academic performance during primary, elementary and secondary education and even to the educations of young adults,[1] along with promoting healthy eating habits and enhancing the human right to adequate nourishment.[2]

The menus should be prepared by a nutritionist registered in the National Fund for Education Development (FNDE) This professional has the responsibility for planning safe, adequate and healthy nutrition, and one that takes into account regional eating habits and culture, in order to guarantee food and nutritional safety of the students.[3] Resolution CD/FNDE 26, of June 17, 2013 establishes, among other provisions, the values for meeting the nutritional requirements of the students by area of schooling and age groups.[3]

In addition, it is important to consider the social relevance of school meals, which often represents the main or sole meal of the day for the student,[4] as well as the existing difficulties in the planning process of the meals, primarily the cost-benefit dilemma, and the acquisition of food, exposing the students to the risk of inadequacy in the school meals supplied.[5,6] Accordingly, it is necessary to assess the nutritional adequacy of the proposed menus, permitting actions towards the improvement in the quality of the service rendered.

The purpose of this paper was to compare the estimated values in the food composition tables (TACO) for adequacy of the total caloric value in the school menus.

METHODS

A documental and descriptive study, based on the assessment of the PNAE menus in a large sized municipality (over 100 thousand inhabitants) in the interior of the state of Sergipe, accessed through the *Conviva Educação,* a free management system geared towards the municipal education management and technical teams of the departments, such as the Nutrition team.

The menus were assessed using two food composition tables, in order to compare the existing differences in the values supplied by each of these: the Brazilian Food Composition Table, developed by the Food Study and Research Center (NEPA), of *Universidade Estadual de Campinas* (Unicamp),[7] and the Brazilian Food Composition Table, from the Family Budget Research (2008-2009), by the Brazilian Institute of Geography and Statistics (IBGE).[8]

According to FNDE data, supplied by the Municipal Education Department, in 2018 there were 7,402 students attended, including those with specific nutritional requirements, distributed among the following areas: Adult and Young Adult Education (EJA), pre-school, elementary school, half-period daycare, full daycare and *Mais Educação* program.Each area has to attend to a minimum daily nutrition percentage varying from 20% to 70%.

The six areas of study of the municipality were included in the research, and 12 menus were analyzed, totaling 60 days: each area of education counts two meals, with exception to pre-school and elementary school, which have four different menus, in such a manner that the program alternates, within the month, in a weekly fashion. Special menus were not included, in other words, those geared for students affected by pathologies. The menus for the year 2019 are informed in charts 1 to 5, by area of education.

Chart- 1. EJA menu, 2019.

Monday	Tuesday	Wednesday	Thursday	Friday
Weeks 1 and 3				
Couscous with milk and eggs Acerola juice	Pasta with minced meat and vegetables Acerola juice	Sweet potato and chicken Acerola juice	Rice with beef jerky and vegetables Banana	Chicken soup Orange
Weeks 2 and 4				
Banana and papaya milkshake	Stir-fried cassava with shredded beef jerky	Chicken risotto with vegetables	Bean soup with meat, vegetables and noodles	Chicken noodles
Salty biscuit	Watermelon	Acerola juice	Banana	Orange

Chart- 2. Food plan for pre-school and elementary school, 2019.

Monday	Tuesday	Wednesday	Thursday	Friday
Week 1				
Couscous with milk and eggs Acerola juice	Pasta with minced meat and vegetables Watermelon	Shepherd's pie of cassava and beef jerky (*escondidinho)* Acerola juice	Chicken soup Orange	Rice with beef jerky and vegetables Banana
Week 2				
Sweet potato with chicken Acerola juice	Chicken in a cassava pure (*bobó*) with rice Watermelon	Chicken risotto with vegetables Guava juice	Bean soup with meat, vegetables and noodles Banana	Chicken noodles Orange
Week 3				
Rice with beef jerky and vegetables Banana	Couscous with milk and eggs Mango juice	Pasta with minced meat and vegetables Watermelon	Cassava broth with beef jerky (*caldinho)* Banana	Chicken soup Orange
Week 4				
Chicken noodles Orange	Sweet potato and chicken Acerola juice	Stir-fried cassava with shredded beef jerky Watermelon	Chicken risotto with vegetables Guava juice	Bean soup with meat, vegetables and noodles Banana

Chart-3. Menu for half-period daycare, 2019.

Monday	Tuesday	Wednesday	Thursday	Friday
Weeks 1 and 3				
Banana and papaya milkshake Salty biscuit	Pasta with minced meat and vegetables Orange	Sweet potato with chicken Acerola juice	Oatmeal porridge with slices of banana	Chicken risotto with vegetables Watermelon
Weeks 2 and 4				
Couscous with milk and eggs Mango juice	Stir-fried cassava with shredded beef jerky Watermelon	Carrot cake Passion fruit juice	Bean soup with meat, vegetables and noodles	Chicken noodles with grated carrots Orange

Chart- 4. Menu for *Mais Educação*, 2019..

Monday	Tuesday	Wednesday	Thursday	Friday
Weeks 1 and 3				
Morning break				
Rice with beef jerky and vegetables Banana	Couscous with milk and eggs Mango juice	Pasta with minced meat and vegetables Watermelon	Cassava broth with beef jerky Banana	Chicken soup Orange
Lunch				
Rice, beans, chicken stew with carrots Acerola juice	Rice, beans, beef stew with potatoes, braised kale Watermelon	Pasta, strips of liver, potato and carrot salad Banana	Colored rice, beans, diced chicken and onions, raw carrot and beetroot salad Passion fruit juice	Rice, bean stew *(feijoada)* with vegetables Orange
Afternoon break				
Couscous with milk and eggs Acerola juice	Pasta with minced meat and vegetables Watermelon	Shepherd's pie of cassava and beef jerky *(escondidinho)* Acerola juice	Chicken soup Orange	Rice with beef jerky and vegetables Banana
Weeks 2 and 4				
Morning break				
Chicken noodles Orange	Sweet potato with chicken Acerola juice	Stir-fried cassava with shredded beef jerky Watermelon	Chicken risotto with vegetables Guava juice	Bean soup with meat, vegetables and noodles Banana

Chart-4. Menu for *Mais Educação*, 2019..(Continues)

Monday	Tuesday	Wednesday	Thursday	Friday
Lunch				
Rice, beans, okra stew with meat Pineapple juice	Rice, beans, beef stew with vegetables Watermelon	Colored rice, beans, chicken strips, raw carrot and beetroot salad Orange	Rice, beans with cassava flour (*tropeiro)*, stewed beef, vegetable salad Passion fruit juice	Noodles, stewed chicken with vegetables Banana
Afternoon break				
Sweet potato with chicken Acerola juice	Chicken in a cassava pure with rice Watermelon	Chicken risotto with vegetables Guava juice	Bean soup with meat, vegetables and noodles Banana	Chicken noodles Orange

Chart-5. Menu for full daycare, 2019.

Monday	Tuesday	Wednesday	Thursday	Friday
Weeks 1 and 3				
Morning break				
Oatmeal porridge	Couscous with milk and eggs	Milk flour porridge	Rice pudding	Corn meal porridge
Almoço				
Noodles, beans, minced meat with vegetables Mango juice	Colored rice, beans, stewed chicken, mashed potatoes Passion fruit juice	Rice, bean stew (*feijoada)* with meat and vegetables Passion fruit juice	Rice, beans, strips of beef, vegetable salad Guava juice	Rice, beans, stewed beef, carrot and beetroot salad Umbu juice
Afternoon break				
Oatmeal porridge	Couscous with milk and eggs	Milk flour porridge	Rice pudding	Corn meal porridge
Weeks 2 and 4				
Morning break				
Milk flour porridge	Rice pudding	Corn meal porridge	Cassava and eggs Guava juice	Oatmeal porridge
Lunch				
Rice, beans, strips of chicken, mashed potatoes Passion fruit juice	Rice mixed with carrots, beans, okra stew with meat Guava juice	Pasta, beans, stewed chicken with vegetables Mango juice	Rice, bean stew with braised kale Acerola juice	Rice, beans, beef stew with vegetables Watermelon
Afternoon break				
Milk flour porridge	Rice pudding	Corn meal porridge	Cassava and eggs Guava juice	Oatmeal porridge

The technical files of the offered preparations were consulted, through *Conviva Educação,* which uses the TACO to estimate the nutritional value of the menus. The estimated values, using the IBGE table, were calculated using the Microsoft Excel software. The menus were separated by area of education and type of meal (morning break, afternoon break, evening break and lunch), considering the total caloric value (TCV) in kcal.

The values found were compared to the recommendations by area of education and age group under Resolution CD/FNDE 26/2013, which provisions on the compliance of the PNAE regarding school meals for elementary education students. A ±10%margin was considered in the adequacy suggested by the FNDE, as interval for classifying the daily menus as "adequate" or "inadequate" in accordance with the calory supply. Subsequently, the adequacy values were categorized as "adequate", "above" or "below" the recommended values and translated in absolute and relative frequencies, weekly mean value and standard deviation.

RESULTS

The TCVs of the menus are under table 1, per day, weekly mean value and standard deviation, based on the calculations made by the IBGE Brazilian Food Composition Table (2011) and the TACO (2011), and the respective adjustments based on the values established by the FNDE for each area of education.

Table 1. Comparison of the nutritional value of the annual menus offered by the PNAE using the TACO (Conviva) and IBGE food composition tables. Lagarto, Sergipe, 2019.

FNDE (kcal)		IBGE (kcal)	Adequacy (%)	TACO (kcal)	Adequacy (%)
EJA, weeks1 e 3					
Monday	435	494.3	113.3	475.6	109.3
Tuesday	435	419.1	96.3	534.1	99.8
Wednesday	435	471.8	108.4	480.1	110.4
Thursday	435	422.0	97.0	521.9	120.0
Friday	435	413.2	95.0	511.9	117.7
Weekly mean	435	444.1	102.1	504.7	116.0
SD		36.6		25.8	
EJA, weeks 2 e 4					
Monday	435	460.4	105.8	476.6	109.6
Tuesday	435	486.9	111.9	492.9	113.3
Wednesday	435	488.3	112.2	610.2	140.3
Thursday	435	449.5	103.3	540.6	124.3
Friday	435	384.3	88.3	606.1	139.3
Weekly mean	435	453.9	104.3	545.3	125.3
SD		42.4		62.0	
Pre-school and elementary school, week 1					
Monday	400	577.4	144.4	560.4	140.1
Tuesday	400	418.4	104.6	534.1	133.5
Wednesday	400	494.1	123.5	459.4	114.8
Thursday	400	421.6	105.4	511.9	128.0
Friday	400	422.0	105.5	521.9	130.5
Weekly mean	400	466.7	116.7	517.5	129.4
SD		69.6		37.2	

Table 1. Comparison of the nutritional value of the annual menus offered by the PNAE using the TACO (Conviva) and IBGE food composition tables. Lagarto, Sergipe, 2019. (Continues)

FNDE (kcal)		IBGE (kcal)	Adequacy (%)	TACO (kcal)	Adequacy (%)
Pre-school and elementary school, week 2					
Monday	400	383.8	95.9	480.1	120.0
Tuesday	400	514.4	128.6	566.8	141.7
Wednesday	400	346.0	86.5	359.2	89.8
Thursday	400	310.2	77.5	308.6	77.1
Friday	400	431.7	107.9	606.1	151.5
Weekly mean	400	466.4	116.6	464.1	116.0
SD		79.5		128.6	
Pre-school and elementary school, week 3					
Monday	400	404.1	101.0	521.9	130.5
Tuesday	400	527.3	131.8	560.4	140.1
Wednesday	400	413.1	103.3	534.1	133.5
Thursday	400	528.5	132.1	531.2	132.8
Friday	400	414.4	103.6	511.9	128.0
Weekly mean	400	457.5	114.4	531.9	133.0
SD		64.4		18.15	
Pre-school and elementary school, week 4					
Monday	400	405.3	101.3	606.1	151.5
Tuesday	400	467.9	117.0	480.1	120.0
Wednesday	400	484.9	121.2	492.9	123.2
Thursday	400	337.7	84.4	359.2	89.8
Friday	400	311.4	77.8	308.6	77.1
Weekly mean	400	401.4	100.4	449.4	112.3
SD		76.8		117.6	
Half-period daycare, weeks 1 e 3					
Monday	300	460.4	153.5	476.6	158.9
Tuesday	300	377.4	125.8	408.8	136.3
Wednesday	300	451.8	150.6	480.1	160.0
Thursday	300	348.5	116.2	305.8	101.9
Friday	300	318.4	106.1	380.4	126.8
Weekly mean	300	391.3	130.4	410.3	136.8
SD		62.8		72.6	
Half-period daycare, weeks 2 e 4					
Monday	300	575.3	191.8	551.2	183.7
Tuesday	300	484.9	161.6	542.4	180.8
Wednesday	300	265.6	88.5	349.9	116.6
Thursday	300	192.3	64.1	327.4	109.1
Friday	300	230.9	77.0	353.2	117.7
Weekly mean	300	349.8	116.6	424.8	141.6
SD		169.7		111.8	

Table 1. Comparison of the nutritional value of the annual menus offered by the PNAE using the TACO (Conviva) and IBGE food composition tables. Lagarto, Sergipe, 2019. (Continues)

FNDE (kcal)		IBGE (kcal)	Adequacy (%)	TACO (kcal)	Adequacy (%)
More education, weeks 1 e 3					
Monday	1500	1354.4	90.3	1565.7	104.4
Tuesday	1500	1433.7	95.6	1582	105.5
Wednesday	1500	1417.1	94.5	1640.5	109.4
Thursday	1500	1426.8	95.1	1781.7	118.8
Friday	1500	1438.7	95.9	1792.3	119.5
Weekly mean	1500	1414.7	94.3	1672.4	111.5
SD		34.3		108.3	
More education, weeks 2 e 4					
Monday	1500	1387.3	92.5	1727.6	115.2
Tuesday	1500	1480.7	98.7	1868.9	124.6
Wednesday	1500	1294.2	86.3	1397.1	93.1
Thursday	1500	1538.2	102.5	1660.5	110.7
Friday	1500	1117.9	74.5	1867.4	124.5
Weekly mean	1500	1363.7	90.9	1704.3	113.6
SD		165.8		194.0	
Full daycare, weeks1 e 3					
Monday	700	913.6	130.5	1149.8	164.3
Tuesday	700	1616.0	230.9	1401.6	200.2
Wednesday	700	1208.4	172.6	1273.2	181.9
Thursday	700	932.6	133.2	1046.2	149.5
Friday	700	856.9	122.4	1233.3	176.2
Weekly mean	700	1105.5	157.9	1220.8	174.4
SD		316.1		133.3	
Full daycare, weeks 2 e 4					
Monday	700	1247.7	178.2	1274.0	182.0
Tuesday	700	941.1	134.4	1241.5	177.4
Wednesday	700	832.5	118.9	1079.3	154.2
Thursday	700	912.7	130.4	1039.8	148.5
Friday	700	1054.6	150.7	1264.3	180.6
Weekly mean	700	997.7	142.5	1179.8	168.5
SD		160.8		111.3	

EJA: Adult and Adult Young Education.
SD: Standard Deviation. Adequacy: ± 10% VCT.

Out of the days analyzed using the IBGE table, five weeks (41.7%) had an adequate TVC weekly mean value compared to the values recommended by the FNDE, corresponding to 25 out of the 60 days assessed. The average of the remaining weeks was above recommended (58.3%). Table 2 demonstrates these values and characterizes the adequacy by area of education, showing the quantity of days with adequate or

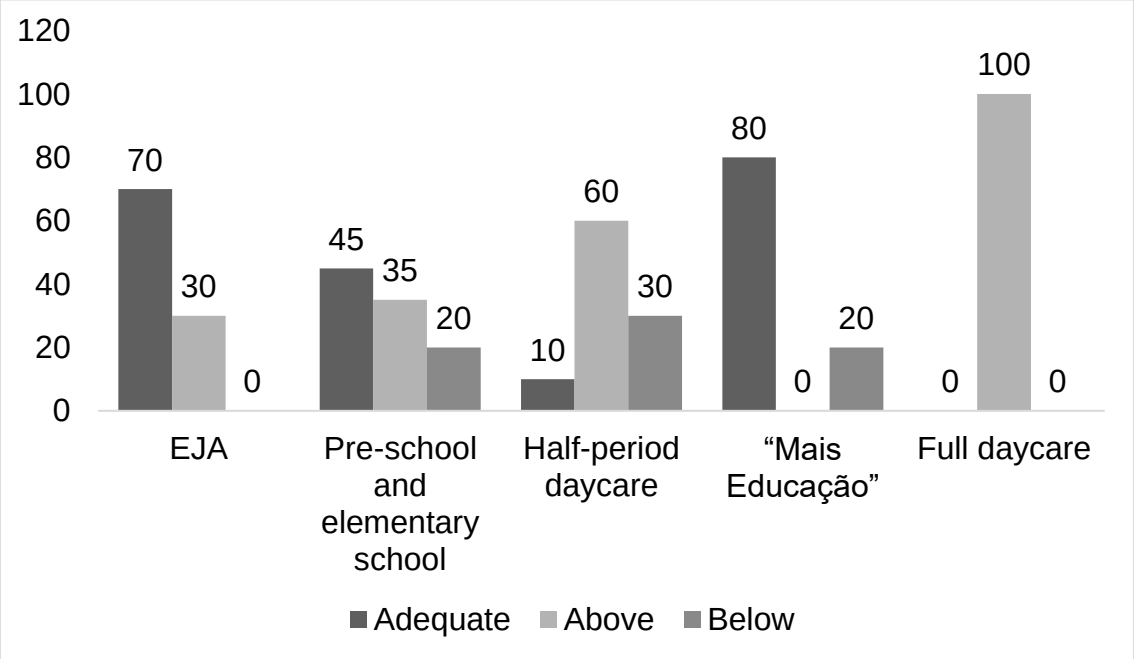
inadequate menus compared to the total amount of days. Figure 1 demonstrates the percentage distribution of these adequacies.

Table 2. Adequacy of the menus using the IBGE food composition table, according to the values recommended by the FNDE for school meals, per area of education. Lagarto, Sergipe, 2019.

Areas	ADEQUATE	%	ABOVE	%	BELOW	%
EJA	7/10	70.0	3/10	30.0	0/10	0.0
Pre-school and E.S.	9/20	45.0	7/20	35.0	4/20	20.0
Half-period daycare	1/10	10.0	6/10	60.0	3/10	30.0
Mais educação	8/10	80.0	0/10	0.0	2/10	20.0
Full daycare	0/10	0.0	10/10	100.0	0/10	0.0
Total*	25/60	41.7	26/60	43.3	9/60	15.0
Weekly mean	5/12	41.7	7/12	58.3	0/12	0.0

EJA: Adult and Adult Young Education. E.S.: Elementary School.
* Adequacy by number of days evaluated.

Figure 1. Distribution of the adequacy (%) of energy supplied by the menus, calculated using the IBGE food composition table, per area of education. Lagarto, Sergipe, 2019.



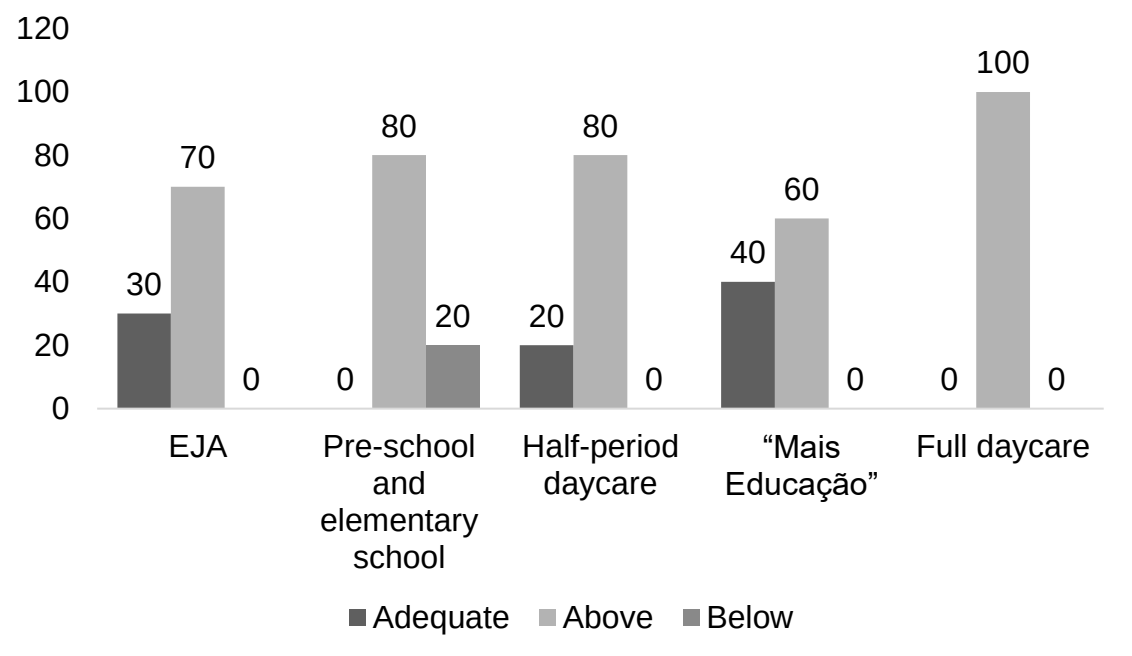
However, in accordance with the TACO (2011), none of the weekly mean values was in accordance with the FNDE. Per day, 25 were adequate (41.67%), but 26 were over (43.33%) and 9 were under (15.0%). Table 3 also demonstrates these values per area of education, and Figure 2 demonstrates the percentage distribution of the adequacies.

Table 3. Adequacy of the menus using the TACO food composition table, according to the values recommended by the FNDE for school meals, per area of education. Lagarto, Sergipe, 2019.

Areas	ADEQUATE	%	ABOVE	%	BELOW	%
EJA	3/10	30.0	7/10	70.0	0/10	0.0
Pre-school an E.S.	0/20	0.0	16/20	80.0	4/20	20.0
Half-period daycare	2/10	20.0	8/10	80.0	0/10	0.0
Mais educação	4/10	40.0	6/10	60.0	0/10	0.0
Full daycare	0/10	0.0	10/10	100.0	0/10	0.0
Total*	25/60	41.7	26/60	43.3	9/60	15.0
Weekly mean	0/12	0/12	12/12	100.0	0/12	0.0

EJA: Adult and Adult Young Education. E.S.: Elementary School.
* Adequacy

Figure 2. Distribution of the adequacy (%) of energy supplied by the menus calculated using the TACO (Conviva), per area of education. Lagarto, Sergipe, 2019.



DISCUSSION

Analysis of the results evidenced, based on the food composition tables, discrepancies between the energetic value of the menus programmed for the municipality and those proposed by the FNDE, institutionally qualified entity for offering such recommendations. Values above those recommended prevailed, suggesting an offer above the nutritional requirements of the assisted public, reaching, in some days, a program 200% above the recommended values.

The energy consumption over what is required for the age group is harmful for the individual and could contribute towards excess weight, the development of obesity and other chronic diseases, especially when taking into consideration children and teenagers, where the impact could have a negative impact on their development.[9]

In available literature, some studies have similar methodologies. The findings, however, are diverse, despite all of them having encountered inadequacies in the proposed menus or in the food consumption of the students inside the schools in at least one age group. Silva & Gregório[6] found values above as well as values below those recommended by the PNAE, varying in accordance with the age groups of the students, as also found in the study by Martino et al.[10] Danelon et al.[11] on the other hand, found values below those recommended. In this case the inadequacy was even greater, once the study involved the program "*Escola de Tempo Integral*" (full-time school) from the state of São Paulo, and the government of São Paulo indicated the fulfillment of 50% of the nutritional requirements of the students, differently to the FNDE, which for the full-time modality indicates fulfillment of 70% of the requirements for these individuals. Such a reduced proportion in the supply of energy was also found in a study developed by Flávio.[12]

In a study by Issa et al.,[13] despite the consumption having been lower than the requirements, it was also verified that the proposed menu was not in accordance with the reference values of the FNDE for energy and nutrients. It is necessary to emphasize the need for the supply of nutritionally balanced meals, as provisioned under Resolution CD/FNDE 26/2013.3 The inadequacy of the menu, below the proposed values, despite having been found in lesser frequency in this study, exposes the student to the risk of food and nutritional insecurity, once it does not contribute towards attaining 100% of the daily energy requirements. In general, this possibility could lead to the use of alternative metabolic means for producing energy, such as inducing lipolysis an muscle proteolysis, which, in children and young adults, could also reflect on the adequate linear growth.[6,11]

When considering a qualitative menu for analysis of the results obtained, it is possible to perceive, for example, that beef jerky appears many times on the menus and educational areas, at least once a week, in preparations such as Shepard's pie with cassava and cassava broth. It is important to observe that beef jerky is a characteristic meal in the region, which could influence its inclusion in the school meals. But together with the chicken in cassava pure (*bobó*) and bean stew (*feijoada*), these are preparations with a high density of energy, which could explain the prevailing values, apart from being in conflict with the promotion of healthy eating habits, which is also proposed by PNAE.[2]

Resolution CD/FNDE 26/2013 also proposes the limit of the consumption of sweets and preparation of sweets to two weekly proportions, with exception to porridge due to the respect for food culture and the various existing realities,[3] it is observed that this preparation in the full-time daycare is repeated six times a week in the morning and afternoon breaks. Apart from the monotony generated by the offer restricted to oatmeal, milk meal and cornmeal porridges, above all when considering the addition of sugar to the preparation, there is a high offer of simple sugar, with a high glycemic indexand glycemic load, which are characteristics related to the development of type 2 diabetes mellitus and other chronic diseases.[14]

Conversely, it is important to highlight that this study analyzes the programmed menu. Food consumption inadequacies reported in literature are attributed to differences between what was programmed and what was prepared by the school meal agents, due to issues in the acquisition and distribution processes of the food.[13] However, regarding the planning issues, the results obtained indicate the difficulty in adapting the meals to the context of the PNAE, also reported in other studies,[9] once the choice of food is a decision that must be in accordance with the funds received, limited by meal and area of education, healthy food, local eating habits and local propensity for production and trade.

FINAL CONSIDERATIONS

The assessment of the menus predominantly revealed caloric values above these established for school meals in accordance with the FNDE. Such situation exposes the difficulties observed in following the PNAE menus, as well as having to deal with promoting healthy eating habits among the students as a health promotion practice. This comes to demonstrate the importance of the nutritionist in school meals and, in this case, in the assessment of the program, which requires respect towards local culture, but also the approach of nutrition as an educational strategy.

The strengthening of family agriculture in the PNAE and a greater participation of the students in the putting together of the menus and in the food and nutritional education actions could be strategies that will permit a greater autonomy of this public, guaranteeing the realization of the principals of school meals associated to a good adhesion of the students

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