

Avaliação qualitativa e identificação de alimentos regionais das preparações oferecidas em um refeitório universitário

Qualitative evaluation and identification of regional foods of the preparations offered in a university refectory

Evaluación cualitativa e identificación de alimentos regionales de los preparados ofrecidos en una referencia universitaria

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Resumo: Avaliar qualitativamente e verificar a presença de alimentos regionais nos cardápios ofertados de uma unidade de alimentação em âmbito universitário. Estudo transversal de caráter qualitativo no Refeitório Universitário realizado durante os meses de julho a dezembro de 2019 em que foram coletados 23 cardápios e analisados com base no método Análise Qualitativa das Preparações do Cardápio, sendo contabilizado a frequência semanal de folhosos, preparações ricas em enxofre (exceto feijão), frutas, doces, frituras, frituras associadas a doces, carnes gordurosas e monotonia de cores. Verificou a presença de alimentos regionais presentes nos cardápios. Os resultados foram submetidos ao teste de Kruskal-Wallis com 5% de significância ($p < 0,05$). Entre os sete itens avaliados, 5 deles foram classificados como positivos, sendo eles: ótima oferta de folhosos, boa presença de frutas, doces, frituras e fritura associada com doce e regular monotonia de cores iguais. Já a presença de carnes gordurosas e alimentos ricos em enxofre foram classificados como aspectos negativos dos cardápios. Quanto a inclusão de alimentos regionais observou-se situação regular. A adequada construção de cardápios permite a adequação das necessidades nutricionais, promoção a saúde e valorização do patrimônio cultural local quando correlacionado aos alimentos regionais.

Palavras-Chave: Serviços de alimentação; Dietética; Educação alimentar e nutricional; Qualidade dos alimentos; Consumo de alimentos.

Abstract: To evaluate the quality of menus and to verify the presence of regional foods offered at a university refectory. Cross-sectional qualitative study conducted at the University refectory from July to December 2019, in which 23 menus were collected and analyzed based on the Qualitative Evaluation of Menu Preparation method, counting the weekly frequency of leafy greens, preparations rich in sulfur (except beans), fruits, sweets, fried foods, fried foods associated with sweets, high-fat meats and monotone colors. The presence of regional foods was verified on the menus. The results were submitted to the Kruskal-Wallis test with a 5% significance level ($p < 0.05$). Among the seven items evaluated, 5 of them were classified as positive, which are: excellent availability of leafy greens, good presence of fruits, sweets, fried foods, and fried foods associated with sweets and monotony of similar colors at a regular level. The presence of high-fat meats and foods rich in sulfur were classified as negative aspects of the menus. A regular situation was observed regarding the inclusion of regional foods. The adequate construction of menus allows the adaptation of nutritional needs, health promotion and valorization of the local cultural heritage when correlated to regional foods.

Key words: Food services; Dietetics; Food and nutrition education; Food quality; Food consumption.

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Resumen: Valorar y verificar cualitativamente la presencia de alimentos regionales en los menús ofrecidos en una unidad de alimentación universitaria. Estudio cualitativo transversal en la Cafetería Universitaria realizado durante los meses de julio a diciembre de 2019, en el que se recopilaron y analizaron 23 menús con base en el método Análisis Cualitativo de Preparaciones de Menú, teniendo en cuenta la frecuencia semanal de preparaciones de hoja rica en azufre (excepto frijoles), frutas, dulces, frituras, frituras asociadas a dulces, carnes grasas y monotonía de colores. Verificó la presencia de alimentos regionales presentes en los menús. Los resultados fueron sometidos a la prueba de Kruskal-Wallis con un nivel de significancia del 5% ($p < 0.05$). De los siete ítems evaluados, 5 de ellos fueron clasificados como positivos, los cuales son: excelente oferta de hoja, buena presencia de frutas, dulces, frituras y frituras asociadas a la monotonía dulce y regular de colores iguales. La presencia de carnes grasas y alimentos ricos en azufre se clasificaron como aspectos negativos de los menús. En cuanto a la inclusión de alimentos regionales, se observó una situación regular. La adecuada construcción de menús permite la adecuación de las necesidades nutricionales, la promoción de la salud y la valorización del patrimonio cultural local cuando se correlaciona con los alimentos regionales.

Palabras clave: Servicios de comida; Dietética; Educación alimentaria y nutricional; Calidad de la comida; Consumo de comida.

1 Introduction

University refectories are a type of food and nutrition unit (SFNU), inserted in the food assistance actions of the National Student Assistance Plan, which enables equal opportunities and contributes to improving the performance of university students (IMPERATORI, 2017).

These sites have a well-defined audience, university students and the academic community, due to their need to have a meal in the workplace and/or study areas. Furthermore, it optimizes users' time for having a meal and returning to relevant activities. Another relevant point is that the university refectory becomes one of the only places to provide low-cost, adequate, and healthy food inside educational institutions. In this context, it drives the discussion of the socio-cultural aspects of food in terms of the cultural prism and social inequalities rooted in the concept of the National Food and Nutrition Policy (JUNIOR *et al.*, 2015; BARBARINI; DE MARIO, 2020).

Lifestyle and eating patterns are correlated with the increasing incidence of chronic non-communicable diseases (NCDs) such as cardiovascular diseases, obesity, diabetes mellitus, among others. In Brazil, these diseases correspond to 75,8% of the causes of death in 2015 (MALTA *et al.*, 2017). Moreover, data from the National Health Survey in 2013, show that more than 45% of the adult population reports at least one comorbidity (MALTA *et al.*, 2017; MALTA *et al.*, 2019).

On this basis, the need to adopt changes in lifestyle is emphasized, such as the inclusion of a healthy and balanced diet (BORBA, LEMOS; HAYASIDA, 2015; MENDONÇA, 2016). Therefore, university refectories are expected to contribute to access to a safe, harmonious,

nutritionally balanced meal, in quantity and quality, and to include regional foods, respecting the food culture of users and promoting food and nutrition education (LISBOA, 2015; RAMÍREZ; MOREIRA; OLIVEIRA, 2016).

The Qualitative Evaluation of Menu Preparations (QEMP), developed by Veiros and Proença (2003), has been researched in the production of meals, and is a method that focus on assisting the nutritionist in the preparation of menus regarding sensory aspects as well as nutritional quality and quantity (BARROZO; MENDONÇA, 2015). Hence, this tool aims to assess the menu composition in relation to colors, repetitions, preparation techniques, combinations and the availability of fruits, vegetables, and meat types (VEIROS; PROEÇA, 2003).

Given the importance of evaluating the menus, with the purpose of offering balanced, diverse, culturally accepted meals and promoting healthier eating habits, this study aims to evaluate the qualitative aspects of the preparations, as well as the availability of regional food at the University refectory of Campus Professor Antônio Garcia Filho in the Federal University of Sergipe, Lagarto (RefLag).

2 Methodology

This is a qualitative cross-sectional study in RefLag. Data collection was performed from July to December 2019, totaling 23 menus in 107 days of the studied SFNU.

2.1 Food Unit Characterization

RefLag has a standardized lunch menu, consisting of two main dishes (protein), two dressings, two side dishes, salad, dessert (fruit or sweet) and juice, characterized as an average standard menu. The menus are prepared by the contractor's nutritionist, evaluated by a nutritionist who is the contract's inspector (technical public servant at the university) and published weekly on the university's website.

The service model is divided in portioned dishes and self-service, with the preparations served on thermal counters and distributed as follows: the main dishes offered through the first model and the other options through the second model. As for the distribution system, RefLag uses a mixed model, as some meals are produced and distributed on site and others are produced

at another location and distributed in the cafeteria, therefore, the services are through third parties signing a contract between the company and the University.

The cafeteria provides about 800 daily meals (medium size) at a price of R\$ 1.00 for undergraduate and graduate students and R\$ 6.00 for teachers and public servants.

2.2 Research Instruments

The weekly menus were analyzed based on the Qualitative Evaluation of Menu Preparations (QEMP) method, counting the weekly frequency (5 days), of leafy greens, preparations rich in sulfur, fruits, sweets, fried foods, high-fat meats and monotone colors (VEIROS; PROENÇA, 2003).

Execution of the QEMP method occurred in three stages (VEIROS; PROENÇA, 2003). In the first stage, preparations were evaluated daily, in the second stage, weekly, and lastly in the third stage, they were evaluated monthly, as the weekly data were grouped and tabulated in percentages related to the total number of days of the assessed menus.

Considering the presence of foods rich in sulfur, menus that have two or more high-sulfur preparations daily will be considered inadequate. We considered as foods rich in sulfur: avocado, chard, celery, garlic, peanuts, sweet potatoes, broccoli, chestnuts, onions, Brussels sprouts, cauliflower, peas, beans, ginger, guava, jackfruit, lentils, apples, watermelon, melon, corn, mustard, turnip, nuts, egg, radish, cabbage, grape, among others. However, the dish prepared with carioca and black beans was not taken into consideration, because in addition to being a mandatory dish according to the contract between the parties, it is also part of the typical Brazilian meal. This food was only considered when offered as *tropeiro* beans (VEIROS; PROENÇA, 2003).

Sweets are considered desserts and preparations that contain sugar as one of their main ingredients, such as chocolate, cake, pudding, pie, among others. Fried foods will be considered in isolation as well as when they are associated to sweets. High-fat meats are chuck steak, beef cap of cube roll, meat chop, sirloin, ribs, sausages (sausage, weenie and hamburger), flank steak, *picanha*, shoulder, neck, short ribs and viscera (VEIROS; PROENÇA, 2003).

Regarding the visual aspect, menus will be considered monotone when two preparations are the same color or when there are only two colors on the daily menu (VEIROS; PROENÇA, 2003).

The presence of leafy greens and fruits will be assessed as a positive aspect of the menu according to the percentage distribution, proposed by Prado, Nicoletti and Faria (2013), classifying them as: "Excellent" ($\geq 90\%$); "Good" (75 - 89%); "Regular" (50 - 74%); "Bad" (25 - 49%) and Poor ($<25\%$) (PRADO, NICOLETTI and FARIA, 2013).

The appearance of equal colors, two or more preparations rich in sulfur, high-fat meat, fried foods, sweets and the offering of sweets and fried foods on the same day will be considered negative aspects of the menu and classified as: "Excellent" ($\leq 10\%$); "Good" (11 - 25%); "Regular" (26 - 50%); "Bad" (51 - 75%) and Poor ($>75\%$) (PRADO; NICOLETTI; FARIA, 2013).

As the study involved the analysis of preparations, purely observational, there was no need to submit the project to the Research Ethics committee. Collection of information was previously authorized by the RefLag nutritionist and contracting company.

2.3 Identification of Regional Foods offered in the Cafeteria

Following the publication "Brazilian Regional Foods" by the Ministry of Health (2015), the presence of food from the northeast region was evaluated. Thus, the use of the following foods in the preparations were analyzed: fruits - acerola, banana nanica, plantain, cocoa, *cajá*, *cajarana*, cashew, *ciriguela*, coconut, palm oil, breadfruit, soursop, *juá*, papaya, passion fruit, pitomba, sapodilla, tamarind, *umbu*; vegetables - squash, watercress, *jurubeba*, *major-gomes*, gherkin, palm, okra, roselle, mesquite; legumes - beans, string beans, green beans, pigeon pea; tubers, roots and cereals - arrowroot, sesame, yam, sedge, cassava, sorghum, tapioca flour; herbs, condiments and spices - chives and coriander (BRASIL, 2015).

2.4 Data Analysis

Data tabulation was performed using the Excel® 2017 software and the results were subjected to the Kruskal-Wallis test with multiple comparisons between groups at the 5%

significance level ($p < 0.05$) for comparison of means. All analyses were performed with Stata®, version 13.

3 Results

Table 1 shows the results of the qualitative analysis, according to the QEMP method.

Table 1. Analysis of the SFNU menus studied, Lagarto (SE), Brazil, 2020.

Months	Days	Fruits	Leafy Greens	Same colors	Rich in sulfur	Sweets	Fried foods	High-fat meats	Fried foods + sweets
July	22	18 ^a	22 ^a	14 ^a	17 ^a	4 ^{bc}	5 ^a	11 ^{bc}	1 ^b
August	16	11 ^d	16 ^{bd}	6 ^b	9 ^b	5 ^{ac}	5 ^a	10 ^{bd}	2 ^a
September	16	13 ^{bc}	16 ^{bd}	6 ^b	9 ^b	3 ^b	5 ^a	7 ^d	1 ^b
October	21	15 ^{ab}	21 ^{ac}	7 ^c	11 ^a	6 ^a	3 ^{bc}	13 ^a	1 ^b
November	17	13 ^{bc}	17 ^{bc}	10 ^{ac}	9 ^b	5 ^{ac}	2 ^c	12 ^{ac}	0 ^c
December	15	12 ^{cd}	15 ^d	6 ^b	6 ^b	3 ^b	4 ^b	12 ^{ac}	0 ^c
Total	107	82	107	49	61	26	24	65	5
% occurrence		76.64	100.00	45.79	57.01	24.3	22.43	60.75	4.67
Category		Good	Excellent	Regular	Poor	Good	Good	Poor	Excellent

Note: Average values over the month analyzed.

Values submitted to the Kruskal-Wallis test with multiple comparisons among groups.

(a, b, c, d) averages with the same lowercase letter in the same column do not differ significantly ($p > 0.05$).

When evaluating the positive aspects, the highest significant averages of presence of fruits and leafy greens were in the months of July and October, with a lower average in the months of August and December, respectively.

As for the negative aspects, related to monotone colors and foods rich in sulfur, the highest averages were found in July and November for the first aspect and in July and October for the second. The highest averages for sweets, fried foods, high-fat meats, and fried foods associated with sweets were sequentially in the months of August and November, July to September, October to December and August.

When analyzing the seven items, 5 of them were classified as positive on the menu, as follows: excellent availability of leafy greens (100%) and fried foods associated with sweets

(4.67%) and good presence of fruits (76.64%), sweets (24.3%) and fried foods (22.43%). Monotone colors had a regular incidence (45.79%). The presence of high-fat meats (60.75%) and foods rich in sulfur (57.01%) were classified as negative aspects of the menus.

Table 2 shows the frequency found for the presence of regional foods on SFNU menus. The items related to fruits and legumes presented a frequency above 50%.

Table 2. Analysis of the presence of regional foods from the studied SFNU, Lagarto (SE), Brazil, 2020.

Months	Days	Fruits	Vegetables	Legumes	Tubers, roots and cereals	Herbs, condiments and spices
July	22	11	8	22	8	0
August	16	8	5	16	3	2
September	16	10	5	16	4	0
October	21	12	11	20	4	0
November	17	13	8	16	4	4
December	15	6	6	14	4	1
Total	107	60	43	104	27	7
% occurrence		56.07	40.19	97.20	25.23	6.54

Regional foods and the main preparations that were used are shown in Table 3. Among the regional fruits that appeared in 56.07% on the menus, the one that was most present in meals was acerola, being offered as juice. In relation to vegetables present in 40.19% of the days analyzed, okra was the main regional food offered in preparations such as beans and meat. As for legumes, the only item offered on the menus was carioca and black beans (97.2%). Cassava was the only regional tuber present on the menu (25.23%), being offered as cassava flour and fried cassava, and in the group of herbs and spices, only coriander (6.54%) was present on the menu.

Table 3. Regional foods and their main preparations contained in the SFNU menus studied, Lagarto (SE), Brazil, 2020.

Groups	Foods	Main preparations
Fruits	Acerola, <i>umbu/cajá</i> , cashew, coconut, passion fruit	Juices and desserts
Vegetables	Okra, squash	Beans, and meat with okra
Legumes	Beans	Beans, beans with squash or okra or cabbage or kale
Tubers, Roots and Cereals	Cassava	Cassava flour with soy, cassava flour with carrot, baked cassava
Herbs, Condiments and Spices	Cilantro	Salads

4 Discussion

The findings of this study show adequate availability of leafy greens, fruits, sweets, fried foods and inadequacies regarding monotone colors, significant presence of high-fat meats and foods rich in sulfur. Furthermore, it was observed that despite the presence of regional foods, there was a low variety of items offered.

The nutritionist when preparing the menu of an SFNU has to consider the recommendations contained in the Food Guide for the Brazilian Population (2014) to promote healthy habits (BRASIL, 2014). Thus, menus should offer body regulating foods, such as fruits and vegetables, avoiding the offer of processed and ultra-processed foods, as they are foods with high levels of sugars, sodium, saturated fats, and preservatives (YGNATIÓS; LIMA; DAS GRAÇAS PENA, 2017).

In addition to nutritional aspects such as quality and quantity, a menu must present two additional basic principles: variety and harmony. The first represents the variety of food offerings as a greater inclusion of regional foods, flavors, consistency, temperature, and colors. The second aspect, harmony, is the association of consistency, colors, contributing to a more attractive meal for the consumer. The QEMP can assist the nutritionist to evaluate the menus offered, ensuring the availability of a diverse and proper meal to ensure the supply of necessary nutrients, focused on promoting health and preventing NCDs in individuals served in the food and nutrition unit (YGNATIÓS; LIMA; DAS GRAÇAS PENA, 2017).

As for the presence of fruits and the presence of leafy greens on the analyzed menu, results similar to the study were verified in a university refectory by Resende and Quintão (2016), where fruit consumption was observed in 78.86% of the menus, but 86.53% of leafy greens, a lower

percentage than in this study. According to data obtained by Oliveira *et al.* (2016) in a study conducted at an institutional SFNU, the presence of leafy greens was found in a percentage similar to the menus evaluated.

The Food Guide for the Brazilian Population (2013), emphasizes the importance of consuming fruit and leafy greens for health benefits and recommends that fresh foods should be prioritized. Therefore, including fruits and vegetables on a daily basis is essential for establishing a balanced and healthy diet, as these are foods that in addition to providing micronutrients, supply antioxidants and fibers as well, which are beneficial to the body as they enable a healthier digestive system and prevent and/or control NCDs (LAPUETE *et al.*, 2019).

An important aspect for the nutritionist when planning a menu is to verify that the colors of the daily preparations are not repeated, providing more colorful preparations in order to better draw consumer attention to a healthy meal. A meal with monotone colors has a poor variety of nutrients, interfering with the quality and offerings of vitamins and minerals (VEIROS; PROENÇA, 2003).

According to data from this study, there was a high repetition of colors in the SFNU menus. This result corroborates the findings by De Abreu Souza *et al.* (2019) who evaluated a university SFNU also in the State of Sergipe and observed that 45% of the menus had foods with the same colors. Thus, one of the alternatives to obtain a greater color variety is the diversification of fruits and leafy greens, as in addition to avoiding monotony, this promotes healthier and more attractive meals (BRASIL, 2014).

The presence of two or more foods rich in sulfur, such as cabbage and watermelon, was observed in 57.01% of the days. This result is similar to those observed by Veiros and Proença (2003) who observed 57.7% presence of these foods. While Casaril (2020) obtained results much lower than this study, with 33.4% of foods rich in sulfur.

Foods rich in sulfur may cause abdominal discomfort, so it is important to avoid the presence of two or more these foods (VEIROS; PROENÇA, 2003). Although beans were not counted through QEMP because they are frequently used in meals by the Brazilian population, they can also cause abdominal discomfort, due to the presence of stachyose and raffinose, which are oligosaccharides that are not digested by intestinal enzymes and can cause flatulence, but soaking the beans can contribute to reducing this effect (AI, *et al.*, 2016).

Data presented by Ferreira *et al.* (2015), where they evaluated a food and nutrition unit, observed a frequency of 68.60% regarding the availability of high-fat meats and 39% of frying as a cooking method, a result similar to this study, which obtained a frequency of 60.75% and 22%, respectively.

Fatty meat has a high content of saturated fat and cholesterol and is associated with diseases such as dyslipidemia, obesity, cardiovascular disease, insulin resistance, among other diseases (SCOLLAN *et al.*, 2017). Moreover, when associated with a preparation method such as frying, it becomes even more harmful to the consumer. Probably the large presence of high-fat meats is related to low cost % (PRADO; NICOLETTI; FARIA, 2013). Hence, the importance of the professional nutritionist to supervise and guide the availability of this item should be emphasized.

The low frequency of sweets observed in this study was a positive result different from that found in the study by Da Silva Benvindo, De Souza Pinto and Bandoni (2017) who found a frequency of sweets of 83.33%, more than triple the percentage of this study. The analyzed menu also had a low frequency of offering sweets and fried foods on the same day, results similar to Resende and Quintão (2016) who observed a frequency of 6.73%. However, in the study by Da Silva Benvindo, De Souza Pinto and Bandoni (2017) the result pointed to an availability higher than 30%, much higher than this study and the result found by Resende and Quintão (2016).

Promoting food education with the consumption of healthy foods also permeates the field of choosing food products related to local culture and production, encouraging sustainability and a more robust family agriculture practice (BARBARANI; DE MARIO, 2020; BRASIL, 2009; RAMÍRES, MOREIRA; OLIVEIRA, 2016). The analysis of the university SFNU menus in this study revealed a continued availability of regional foods established by the Ministry of Health for the Brazilian Northeast region (BRASIL, 2015). The presence of beans, okra, squash, and coconut on the menu reveals typical local foods. However, other regional foods as well as preparations made using these items as raw material could be more frequent and varied in the evaluated menus.

In the study conducted by da Silva Benvindo, de Souza Pinto and Bandoni (2017), where they evaluated the menus of several university refectories in Brazil, they showed that, when analyzing the consumption of regional fruits in the Northeast region, they observed the presence

of only banana-nanica and papaya. The study by De Abreu Souza *et al.* (2019) is similar to this study, after all, they observed in the studied menus the inclusion of acerola, plantain, *cajá*, cashew, coconut, palm oil, papaya, passion fruit and umbu. Despite the diversity of fruits such as acerola, *umbu/cajá*, cashew, coconut and passion fruit in the evaluated menus, these foods are found in preparations and not *in natura*.

5 Conclusion

Food is a historical and cultural act, rooted in symbolism, meaning and represents popular eating habits. Establishing the development of menus according to the laws of Escudero and in the perspective of food as cultural heritage contributes to the proper nutritional dimension and in the consent of diners to the food products offered in the food units.

It is expected that this study will contribute as a guide for adjustments in the elaboration of university institutional menus, being recommended the permanent use of the QEMP method to improve the negative aspects and to highlight the positive aspects even more. In addition to strengthening the nutritional balance, this intensifies the offer of regional foods, enabling a more attractive meal with diverse colors.

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