Gastronomia do Pará: avaliação nutricional de ingredientes e pratos típicos com desenvolvimento de cardápio

**Gastronomy of Pará: nutritional evaluation of ingredients and typical dishes with development of menu**

DOI:10.34117/bjdv6n7-262

Recebimento dos originais: 03/06/2020
Aceitação para publicação: 13/07/2020

---

**Johnatt Allan Rocha de Oliveira**
Docente da Faculdade de Nutrição, Universidade Federal do Pará (UFPA)  
Universidade Federal do Pará  
Endereço: Av. Augusto Corrêa, 01, Guamá, Belém-Pa, CEP: 66075110  
E-mail: johnattrocha@yahoo.com.br

**Yasmin Miranda de Matos**
Graduanda da Faculdade de Nutrição, Universidade Federal do Pará (UFPA)  
Universidade Federal do Pará  
Endereço: Av. Augusto Corrêa, 01, Guamá, Belém-Pa, CEP: 66075110  
E-mail: yasminmdematos@gmail.com

**Shidney Salatiel Batista de Lima**
Graduando da Faculdade de Nutrição, Universidade Federal do Pará (UFPA)  
Universidade Federal do Pará  
Endereço: Av. Augusto Corrêa, 01, Guamá, Belém-Pa, CEP: 66075110  
E-mail: shidnei.salatiel@gmail.com

**Anna Paula Rocha e Silva**
Graduanda em Farmácia (ESAMAZ)  
Escola de Ensino Superior da Amazônia  
Endereço: R. Municipalidade, 546 - Reduto, Belém - PA, 66053-180  
E-mail: aninha_rocha@live.com

---

**RESUMO**

Esse trabalho teve como objetivo avaliar a composição nutricional dos principais ingredientes e pratos típicos do Estado do Pará, com desenvolvimento de cardápios. As amostras dos ingredientes (camarão regional, maníva cozida, tucupi e jambu) e pratos típicos (caruru, maniçoba, tacacá e vatapá), foram obtidas em mercado local, da cidade de Belém-PA. As amostras obtidas foram caracterizadas através das análises de pH, acidez total titulável, teor de cinzas, teor de proteínas, teor de lipídeos, teor de carboidratos totais, fibras e Valor Energético Total (VET). Os ingredientes apresentaram valores de umidade elevados que variaram de 60,08 a 86,68 g/100g. O teor de cinzas para os ingredientes variou de 0,45 a 3,08g/100g e de 0,85 a 2,50g/100g para os pratos. O camarão foi o que demonstrou maior teor de proteínas 22,98g/100g, seguido pela maníva com 5,44g/100g. Entre os pratos a maniçoba foi aquele que apresentou os maiores valores de proteínas e lipídios com os valores 11,36g/100g, e 21,41g/100g respectivamente. Quatro sugestões de cardápios foram propostas para o almoço e mostraram que os ingredientes e as preparações regionais podem fazer parte de uma alimentação mais equilibrada e saudável.
ABSTRACT

This study aimed to evaluate the nutritional composition of the main ingredients and typical foods from State of Pará. The ingredients (shrimp regional, maniva, tucupi and jambú) and the typical foods (caruru, maniçoba, tacacá and vatapá) were obtained in local Market and local restaurant, respectively, of the city of Belém-PA. The samples were characterized by pH, total acidity, ash content, moisture, concentration of protein, lipids carbohydrate and fiber and total energy value. The ingredients showed high moisture yields ranging from 60.8 to 86.68g/100g. In the ingredients, ash content ranged from 0.45 to 3.08g/100g, and in the typical foods the values varied from 0.85 to 2.50g/100g. The regional shrimp showed the highest protein yield, 22.98g/100g, followed by maniva with 5.44g/100g. For the typical foods, the ash values varied from 0.85g/100g (caruru) to 2.50g/100g (tacacá). The tacacá and maniçoba presented the lowest and the highest protein and lipid yields with values of 1.66g/100g and 11.36g/100g, respectively, for proteins, and 0.39g/100g and 21.41g/100g, respectively, for lipids. Four menus suggestions were proposed for lunch and showed that ingredients and regional preparations can be part of a balanced and healthy diet.

Keywords: chemical composition, regional foods and typical foods.

1 INTRODUCTION

Food is extremely important in the lives of human beings as it is a necessary action for the maintenance of biological functions, however, it is not limited only to supply the needs of the organism, but also to the social and cultural aspects that involve the act of eating, therefore, it is essential for the construction of the individual's identity, for human expression and for the preservation of culture and history. In this way, the gastronomy of a given place, through typical dishes and ingredients, in addition to contributing to nutritional aspects, also contributes to man being culturally and socially organized [1].

Brazilian gastronomy is the result of the intense cultural mix between indigenous peoples who lived here, Africans, Europeans, and countless other immigrant peoples who settled in Brazil and contributed to the rich cultural heritage, to the formation of Brazilian food preferences and habits [2].

Due to the strong cultural exchange and the great territorial extension of the country, the cuisine of each region has its own peculiarities, these are related to the greater influence of a given culture, the way of preparing food, the climate, its geographical location, values religious, economic and social characteristics, places of consumption, rituals, and traditions that involve eating food. Thus becoming well characteristic of a given region and configuring regional cuisines. From these regional cuisines, typical dishes emerge, which are the ones that stand out the most, these due to their meaning for the group that consumes them, they also become local symbols and end up characterizing a people and their culture compared to other regions and countries [2, 3].

Palavras-Chave: pratos típicos, composição físico-química, alimentos regionais.
As in all of Brazil, Pará cuisine has developed its characteristics, but with little influence from Portuguese and African cuisine, and a strong indigenous influence, which remains today in typical products and dishes such as tucupi, tacacá, duck in tucupi and maniçoba, which are the result of indigenous knowledge about food preparation and processing. The typical cuisine is very strong and present in the life of the people of Pará, which can be considered a strong resistance to the modern way of eating imposed by globalization. Gastronomy, as a cultural manifestation, is an important item to be preserved, especially in the case of traditional productions, linked to a specific community, thus promoting cultural, social, economic development and, mainly, human development [4,5].

The gastronomy from Pará State, is recognized in Brazil for its typical, unique and exotic dishes, and is being spread to other regions of Brazil and the world. In the city of Belém, Pará, the main typical regional foods sold are tacacá, vatapá paraense, caruru paraense and maniçoba, which are sold from morning until night, and are consumed as a main meal or snack. The preparations are made with ingredients available in the region, these are the regional shrimp, jambu, tucupi and maniva [6, 7].

The health of individuals, in general, depends, in large part, on food and knowledge of the nutritional composition of foods, given that the imbalance in the health/food relationship may cause health problems such as cardiovascular disease, obesity, cancer, dyslipidemia, diabetes mellitus, among others. Thus, it is necessary to know the nutritional content of foods for the prevention and health promotion actions and to intervene in the diet of individuals with illnesses, and knowledge of the amounts of proteins, lipids, and carbohydrates in foods is essential for the elaboration of diet plans. [8, 9].

Food composition tables (FCTs) are fundamental tools for understanding the chemical composition of foods. However, the national tables do not yet contain the composition of some foods, mainly the regional ingredients and preparations, data that are necessary for the guidance and preparation of diet plans for regional populations [9].

Thus, further studies on the chemical composition of regional foods, such as typical foods from Pará cuisine, are needed in order to assist health professionals, such as the nutritionist, to create better strategies for guiding and structuring healthier and more adequate diet plans. to the eating habits of local populations, as well as nutritional education activities, assessment of the suitability of micro and macronutrients, and nutritional labeling to contribute to the best choice of food. Thus, the objective of the study was to carry out the analysis of the physical-chemical and nutritional composition of ingredients and dishes typical of Pará cuisine, with the elaboration of adapted menus.
2 MATERIAL E MÉTODOS

2.1 MATERIAL

The typical dishes analyzed were: caruru, maniçoba, tacacá and vatapá collected in local restaurants in the city of Belém-PA. The evaluated ingredients were: shrimp, cooked maniva, tucupi and jambu, which were purchased at an open market in the city of Belém-PA. The samples analyzed at the Laboratory of Food Hygiene and Bioprocesses of the Faculty of Nutrition at the Federal University of Pará, the samples were homogenized in a WALITA blender and stored under freezing (-20°C) until the time of analysis. The ingredients used in the preparation of typical dishes are shown in Table 1.

Table 1. Ingredients used in the preparation of typical dishes from Pará gastronomy.

| typical dishes | Ingredients                                                     |
|----------------|-----------------------------------------------------------------|
| Tacacá         | Cassava gum, tucupi, shrimp, jambu leaves, sweet pepper and garlic |
| Vatapá         | Wheat flour, shrimp, palm oil, coconut milk, tomatoes, onions, green scents, garlic and peppers |
| Caruru         | Cassava flour, shrimp, garlic, tomato, green scent, okra, palm oil, onion, pepper and soy oil |
| Maniçoba       | Maniva, bay leaves, salty bacon, pepperoni sausage, beef jerky, bacon, chorizo, onion and garlic |

2.2 PHYSICOCHEMICAL ANALYSIS

The following analyzes were carried out in triplicate: humidity by drying in an oven at 105°C [11], ash by incineration in a muffle at 550°C [11], protein content by the Kjeldahl method, using the conversion factor 6.25 of the nitrogen content in crude protein [11]. Crude fiber content by the acid detergency method [12], lipids by the Bligh-Dyer method [13]. The total acidity was determined by titration with sodium hydroxide (NaOH) and the pH with the aid of a pH meter, both following the methodologies described by AOAC, [11]. Carbohydrates were determined by difference [14].

2.3 ELABORATION OF ADAPTED MENUS

The nutritional composition of the suggested menus was estimated by consulting the Brazilian Table of Food Composition - TACO [15], the Tables of Nutritional Composition of Food Consumed in Brazil by the Brazilian Institute of Geography and Statistics (IBGE) [16] and from the results of the analyzes carried out in that study.

2.4 STATISTICAL ANALYSIS

The results of the physical-chemical analyzes and the total energy value of typical dishes and ingredients were expressed by means, standard deviation and coefficient of variation.
3 RESULTS AND DISCUSSION

3.1 PHYSICOCHEMICAL CHARACTERIZATION OF TYPICAL INGREDIENTS

The results of the physical-chemical and nutritional composition of the typical ingredients are shown in table 2.

| Analyze              | Ingredients       |                       |                       |                       |
|----------------------|-------------------|-----------------------|-----------------------|-----------------------|
|                      | Regional shrimp   | Jambu                 | Maniva                | Tucupi                |
| pH                   | 8.66 ± 0.05       | 5.9 ± 0.00            | 5.7 ± 0.01            | 3.8 ± 0.00            |
| Total Titratable Acid (°%) | 1.96 ± 0.20       | 3.63 ± 0.28           | 2.18 ± 0.34           | 6.49 ± 0.28           |
| Moisture (g/100g)    | 64.79 ± 0.26      | 90.22 ± 0.31          | 87.03 ± 0.17          | 96.91 ± 0.66          |
| Ashes (g/100g)       | 3.08 ± 0.11       | 1.82 ± 0.15           | 0.75 ± 0.02           | 0.45 ± 0.02           |
| Protein (g/100g)     | 22.98 ± 0.61      | 2.98 ± 0.08           | 5.44 ± 0.16           | 0.35 ± 0.01           |
| Lipids (g/100g)      | 2.40 ± 0.22       | 0.61 ± 0.13           | 3.66 ± 0.47           | 2.04 ± 0.60           |
| Carbohydrates        | 6.75 ± 1.10       | 4.37 ± 0.33           | 3.12 ± 0.42           | 0.25 ± 0.11           |
| Total (g/100g)       | 100               | 100                   | 100                   | 100                   |
| Fibers (g/100g)      | 0.28 ± 0.41       | 1.26 ± 0.04           | 2.10 ± 0.30           | -                     |
| Total energy value (Kcal/100g) | 140.52 ± 0.11    | 34.89 ± 3.05        | 64.48 ± 1.41          | 11.81 ± 2.96          |

As expected, the tucupi was the one with the highest moisture content (96.91g / 100g) because it is a product in liquid form. As for the ash content of the ingredients, they varied between 0.45 to 3.08g / 100g, the latter being attributed to shrimp and just higher because it is a product that goes through the cooking and salting process to preserve the food and enhance color [17].

The shrimp had a value of 22.98 g / 100g and was the one with the highest protein content, which is due to this being a product of animal origin. The second highest content was observed in the hand with 5.44g / 100g, followed by jambu with 2.98g / 100g and lastly tucupi, which showed the lowest content among the studied ingredients (0.35g / 100g).

The maniva showed a value of 3.12g / 100g of lipids, the highest value observed, this is because the pre-cooked maniva sold in the open markets in the city of Belém has in its composition other ingredients used to "season" such as bacon and toucinho, foods of animal origin, rich in lipids. The shrimp content of 2.40g / 100g of lipids was found, as it is a food that contains fatty acids in its composition. The lowest levels were found for jambu and tucupi, with 0.62g / 100g and 0.32 g / 100g respectively. For carbohydrates, shrimp, jambu, and maniva had the highest values for this component, with values of 6.37g / 100g, 4.37g / 1008, and 3.66g / 100 respectively. While the tucupi presented 2.04g / 100g of carbohydrates, the lowest value among the others.

Jambu and maniva were low-acid ingredients with a pH of 5.9 and 5.7 respectively. On the other hand, the tucupi had a pH of 3.8, is considered of high acidity, which was confirmed by the total acidity of 6.49%. The shrimp had a pH of 8.66, being classified as a low acid food [18], with a
value of 1.99% of acidity, being the lowest content among the analyzed foods. In a study on Macrobrachium olfessi in fresh and cooked salty forms Santos et al. [19] found a pH value of 7.83 for the second form, a value below that determined for Macrobrachium amazonicum, evaluated in the present study. Shamshad et al. [20] obtained initial pH values of 7.05 in Penaeus merguiensis, which increased to 8.25 after remaining in ice storage for 16 days, which shows the influence of the conservation and storage process on the product's pH. According to Decree No. 9,013 of March 29, 2017 [21], which provides for industrial and sanitary inspection of products of animal origin, the pH value in crustaceans must be less than 7.85 to be considered a fresh product, it can also be applied to chilled or frozen products, however, it does not refer to products that have undergone other conservation processes.

The maniva and jambu showed high fiber values, with values between 1.26g / 100g and 2.10g / 100 respectively, which was expected due to the fact that they are leafy, generally rich in fibers such as cellulose, lignin, and hemicellulose, in its composition [22]. In shrimp, 0.28g / 100g of fibers were found, while in tucupi, no detectable values were found for this component.

Most typical ingredients from Pará had energy values below 100 kcal / 100g, with the exception of shrimp, which has a total energy value of 144.48kcal / 100 kcal, which is due to the fact that it has low moisture and high protein contents and carbohydrates, which contributes considerably to the energy value. Tucupi, on the other hand, had the lowest energy value (11.81kcal / 100g), due to its higher humidity and lower protein, lipid, and carbohydrate content when compared to the others. Furuya et al. [23] when the analyzed composition of freshwater prawn M. amazonicum "in natura" found 70.03 g / 100g, 1.5g / 100g, and 24.8g / 100g for moisture, ash, and proteins respectively. In the present study, the values found were for moisture (64.79g / 100g) and proteins (22.98g / 100g) and were lower than those found by Furuya et al. [23], while the ash value (3.08g / 100g) was higher because it was a food that went through the cooking and salting process. Costa [17], observed for M. amazonicum, after cooking ranging from 5 minutes to 20 minutes, protein levels ranging between 18.78 g / 100g and 21.44g / 100g, close values obtained by this work. M. amazonicum, on the other hand, has high protein values when compared to other species of shrimp marketed around the world, such as Macrobrachium Rosenbergii, which has about 16g / 100g of proteins [24]. The concentrations of this macronutrient, generally, have a low variation during cooking. Therefore the shrimp from fresh water is an important alternative for the inclusion of proteins in the diet, has a high biological value, and is easy to digest [17].

The differences found for the moisture and ash contents in this work are different from those observed by Furuya et al. [23], which can be explained by the different conservation processes applied. In the case of the shrimp obtained for this work, the cooking and salting process reduces its
humidity and introduces minerals directly influencing the ash values. The aforementioned processing is common for shrimp sold in the open markets in Belém, as it improves the appearance of the product, making it more attractive to consumers, increases shelf life and decreases the possibility of microbiological contamination, due to the reduction of the activity of water [17, 25]. Variations between values cannot only be attributed to processing but also environmental factors such as habitat, availability, and the type of food consumed by animals, season, reproductive period, and age of crustaceans [26].

For shrimp, the total lipids observed in this study was 2.4g / 100g, which is higher than that found by Furuya et al. [23] (1.5%) and by Costa [17] (1.45-1.70g / 100g), which can be explained by the fact that fat storage in shrimp occurs in the hepatopancreas that is located in the cephalothorax, thus, shrimp analyzed without excluding this anatomical region tend to have higher amounts of lipids, this concentration of lipids can still vary with environmental factors [23, 26]. The total energy value of M. amazonicum determined by this work, which was 140.52 Kcal / 100g, was higher than that found by Costa [17], obtained values that ranged from 115.41 kcal / 100g to 117.99 kcal / 100g respectively. M.amazonicum also presented VET with a higher value than that presented by TACO [15] for Penaeus brasiliensis, which demonstrated value of 90 kcal / 100g.

### 3.2 PHYSICOCHEMICAL CHARACTERIZATION OF TYPICAL DISHES

Table 3 shows the results of the nutritional characterization obtained for the typical dishes analyzed.

| Ingredients   | Caruru   | Maniçoba | Tacacá   | Vatapá   |
|---------------|----------|----------|----------|----------|
| pH            | 6.73 ± 0.03 | 6.93 ± 0.12 | 5.48 ± 0.06 | 5.88 ± 0.00 |
| Acidez Total Titulável (%) | 1.88 ± 0.10 | 4.31 ± 0.35 | 4.96 ± 0.20 | 1.78 ± 0.10 |
| Moisture (g/100g) | 83.60 ± 0.26 | 60.08 ± 0.37 | 86.68 ± 0.02 | 78.06 ± 0.02 |
| Ashes (g/100g)    | 0.85 ± 0.20 | 1.99 ± 0.01 | 2.50 ± 0.51 | 1.25 ± 0.10 |
| Protein (g/100g)  | 2.95 ± 0.49 | 11.36 ± 0.65 | 1.66 ± 0.02 | 2.17 ± 0.17 |
| Lipids (g/100g)   | 7.50 ± 0.20 | 21.41 ± 0.47 | 0.39 ± 0.00 | 4.77 ± 0.60 |
| Carbohydrates    | 6.00 ± 0.29 | 5.16 ± 0.13 | 8.77 ± 0.47 | 13.75 ± 0.19 |
| Total (g/100g)   | 100       | 100       | 100       | 100       |
| Fibers (g/100g)   | 0.85 ± 0.09 | 0.22 ± 0.02 | 0.70 ± 0.061 | 0.81 ± 0.11 |
| Total energy value (Kcal/100g) | 103.3±2.09 | 258.77±3.68 | 45.23±0.06 | 106.61±0.97 |

The vatapá and the caruru showed moisture levels that were 78.06g / 100g and 83.60g / 100g respectively. These two preparations contain significant amounts of starch in their composition due
to the use of wheat flour in vatapá and manioc flour in caruru and lipid sources such as palm oil and vegetable oil. Maniçoba has the lowest moisture content among the typical dishes analyzed, with a value of 60.08g / 100g of moisture.

The preparations resulted in ash values between 0.85g / 100g (caruru) and 2.50g / 100g (tacacá). The pH of the preparations varied between 5.48 and 6.93, thus being considered of low acidity, a condition that makes them more susceptible to bacterial proliferation [18]. As for the protein content, great differences were found between the analyzed dishes. The preparation with the highest content was maniçoba with 11.36g / 100, while in tacacá the lowest content (1.66g / 100g) was observed. In the case of maniçoba, this high protein content is explained by the presence in its composition of foods of animal origin, mainly edible parts of pigs. The other typical dishes also have ingredients of animal origin, such as shrimp, however, this is a “supporting” ingredient used in small quantities.

The levels of lipids in typical dishes ranged between 21.41g / 100g and 0.39g / 100g. The highest content was found in maniçoba, 21.41 g / 100g, which is equivalent to 74.46g% of the total energy value of the preparation. High lipid consumption can lead to the development of obesity, dyslipidemia, high blood pressure, cardiovascular disease, among other chronic diseases. Thus, it is recommended to consume this dish occasionally and in small amounts [27]. The vatapá and the caruru showed intermediate levels of lipids among the other preparations, with concentrations of 4.77g / 100g and 7.50g / 100g respectively. These dishes have lipid source ingredients in their preparation, such as coconut milk, soybean oil, and palm oil, the latter having both saturated fatty acids and unsaturated fatty acids in their composition [28]. Tacacá was the typical dish that showed the lowest lipid content, being 0.39g / 100g, which is due to the use of foods that contain low concentrations of lipids such as tucupi, jambu, and tapioca gum, some of which were demonstrated by this work.

Regarding carbohydrates, the highest value was observed in vatapá (13.75g / 100g), followed by tacacá (8.77g / 100g) and caruru (6.00g / 100g), these dishes contain items rich in carbohydrates like cassava flour, wheat flour, and tapioca gum. In contrast to the others, the lowest concentration (5.16g / 100g) of carbohydrates was observed in maniçoba among the analyzed preparations.

The fiber contents varied between 0.22g / 100g (maniçoba) to 0.85g / 100 (caruru). The kuru showed the greatest amount of fiber among the studied dishes, this preparation has in its composition okra, which is a vegetable with good amounts of fiber [29]. Tacacá did not present considerable values of fibers. Four of the analyzed preparations had a total energy value above 100 kcal / 100g, except tacacá, which presented 45.23kcal / 100g, as it has high humidity and low levels of lipids and proteins. The maniçoba was the one with the highest VET among the others with a value of 258.77kcal/100g, due to its high content of proteins and lipids, the amount of the latter directly influences the total
energy value, given that it has the higher energy density. Tacacá had a lower energy value among typical dishes both in TCA's and in laboratory analysis. As for the caruru, it was the one that demonstrated the highest total energy value according to the IBGE [16].

3.3 ADEQUACY OF TYPICAL DISHES AND INGREDIENTS TO DAILY NUTRITIONAL NEEDS

According to the recommendations of the World Health Organization (WHO) / Food and Agriculture Organization [30], an individual's daily nutritional needs for macronutrients in percentage, grams, and energy value based on a 2000 kcal diet for a healthy individual are 10 at 15% of VET/day, 50 to 75 g/day and 200 to 300 kcal/day for proteins; 55 to 75% of VET/day, 275 to 375 g/day and 1,100 to 1,500 kcal/day for carbohydrates and 15 to 30% of VET/day, 33,3 to 66,6 g/day and 300 to 600 kcal/day for lipids.

About dietary fibers, the World Health Organization (WHO) and the American Dietetic Association (ADA) [31] recommend a daily intake of 20 to 35g. Figure 1 shows how much the consumption of 100g of the studied foods meets the minimum daily nutritional needs for macronutrients and fibers if considered as a reference for 100%, the minimum value recommended by WHO / FAO [30] and ADA [31].

According to Figure 1, it is possible to state that, among typical dishes, maniçoba would be the one that would supply the highest value of the minimum daily protein requirement, with the value 22%. In the research by Silva et al. [32] on typical dishes from the state of Goiás, it was possible to verify that the empadão from Goiás would supply about 23% of the minimum daily protein needs. Within this same analysis, the shrimp would provide 45.96% of the minimum recommended value of this macronutrient, being the one with the highest value for the protein content, among the analyzed ingredients. Within this same analysis, the shrimp would provide 44% of the minimum recommended value of this macronutrient, being the one with the highest value for the protein content, among the analyzed ingredients.
Figure 1. Percentage of carbohydrates (A), proteins (B), lipids (C) and fibers (D) in 100g of food in relation to the recommended minimum daily needs.

Lipid values were high for dishes such as maniçoba supplying 63.6% of the minimum daily requirement, followed by caruru with 21.2%, values close to the percentage that would be supplied with the consumption of 100g of feijoada (63.72%) and high in relation to the values supplied in 100g of rice with pequi, a typical dish in the state of Goiás, which would be 13.54% [32] and with the consumption of 100g of chicken, which would supply 17.89% of the minimum needs daily lipids.

3.4 ELABORATION AND SUGGESTION OF MENUS

Traditional preparations are mostly caloric and with high lipid content, daily consumption is not advised, however, it is worth mentioning that in the city of Belém the consumption of these foods is generally sporadic, on special occasions and typical festivities. However, in shopping centers, these dishes can be consumed more frequently at lunchtime by local workers, where consumption occurs in greater quantities and accompanied by white rice and, sometimes, cassava flour, this is due to the wide acceptance and more affordable prices [33].

The menus have in their structure an entrance with salad, main dish, side dish, side dish, drink, and dessert. The first menu suggestion indicates vatapá as a main dish, accompanied by regional shrimp as a garnish. The second, on the other hand, contains maniçoba as the main dish, without garnish. The third menu features two of the studied ingredients, as the main dish, boiled chicken and as a garnish, tucupi broth, a combination that is widely consumed by the local population, and as an
accompaniment to rice with jambu. While on the fourth menu we have the combination of the caruru with the regional shrimp, the first as a main dish, and the second as a garnish.

We tried to formulate the menu suggestions according to nutritional parameters recommended by the Workers' Food Program (PAT) [34], which recommends that lunch should contain 600-800 kcal, corresponding to a range of 30-40% of the Total Energy Value - VET (2000 kcal), protein, carbohydrate and total fat content corresponding to 15, 60 and 25% of the VET, respectively and 7-10 g of fibers.

Based on the suggestions, it is possible to realize that typical foods and main ingredients can be inserted in menus with a complete meal, however, these must be well balanced with respect to both macronutrients and micronutrients. The nutritional compositions of the suggested menus were carried out by calculating values for the indicated foods from consultations in the following Tables: Brazilian Table of Food Composition - TACO [15], the Tables of Nutritional Composition of Food Consumed in Brazil by the Brazilian Institute of Geography and Statistics (IBGE) [16] and for typical dishes and ingredients, the results obtained in the physical-chemical analyzes shown here were used.

Figures 2 and 3 show menu suggestions for lunch. The result of the analysis of the 1st Menu (main dish: vatapá) shows that it had a caloric content of 680.24 kcal, which corresponds to 34.01% of the recommended daily caloric value (2000 kcal). The levels of protein, carbohydrate, and total lipids represented, respectively: 12.8, 60.8, and 26.4% of the TEV. The fiber value was 10.67 g. Therefore, for the PAT parameters, the suggested menu is balanced.

The 2nd Menu has maniçoba as its main dish, and because it is a high-lipid dish and already has enough animal protein in its preparation, the suitability of macronutrients was slightly different from what PAT recommends for the lunch meal. The caloric value of the menu was 770.08 kcal, representing 38.5% of the recommended daily energy value. Regarding macronutrients, it is possible to verify that the levels of proteins, carbohydrates, and total lipids represented, respectively: 11.6%, 64.5%, and 23.9% of the VET. The fibers had a value slightly above that recommended for lunch, with a total of 12.25 g.
The nutritional composition of the 3rd Menu (Figure 2), includes cooked chicken as the main dish and tucupi broth in its garnish. The 3rd menu presented 640.88 kcal, which corresponds to 32.04% of the recommended two thousand daily calories. The contents of protein, carbohydrate, and total lipids represented, respectively, 16.8, 58.8, and 24.4% of the TEV. The value of fiber present was 6.82g. Comparing with the nutritional parameters recommended by PAT, this menu is adequate.

The 4th and last menu includes caruru as a main dish and regional shrimp as a garnish, with respect to nutritional analysis, it showed a total VET of 641.76 kcal, which represents 32% of the

---

Brazilian Journal of Development

Figure 2- 1st Menu (containing vatapá and regional shrimp) and 2nd Menu (containing maniçoba)

| 1st Menu | Quant. (g or mL) | Homemade measure |
|----------|-----------------|------------------|
| Appetizer: Tomato | 40 | 4 medium slices |
| Carrot | 24 | 2 tablespoons full |
| Onion | 10 | 2 thin slices |
| Lettuce | 20 | 3 leaves |
| Olive oil | 10 | 1 spoon spoon |

| Main course: Vatapá | 140 | 2 serving spoons |

| Garnish: Regional shrimp | 40 | 8 units |
| Side dish: White rice | 100 | 4 tablespoons |
| Drink: Orange juice | 250 | 1 cup |
| Dessert: Guava | 170 | 1 medium unit |

| 2nd Menu | Quant. (g or mL) | Homemade measure |
|----------|-----------------|------------------|
| Appetizer: Lettuce | 20 | 3 leaves |
| Chard | 20 | 2 leaves |
| Green corn | 30 | 1 full tablespoon |
| Grated carrot | 24 | 2 soup spoon |
| Tomato cut into small cubes | 30 | 2 soup spoon |
| Mango | 50 | 3 soup spoon pidades |
| Chickpeas | 30 | 1 cup |

| Main course: Maniçoba | 80 | 2 serving spoons |

| Garnish: |
| Side dish: White rice | 100 | 4 soup spoon |
| Drink: Guava juice | 250 | 1 cup |
| Dessert: Pineapple | 150 | 1 big slice |

---

Figure 3- 3rd Menu (containing tucupi and jambu) and 4th Menu (containing caruru and regional shrimp)

| 3rd Menu | Salada Crua | Quant. (g or mL) | Homemade measure |
|----------|------------|-----------------|------------------|
| Appetizer: Tomato | 40 | 4 medium slices |
| Lettuce | 20 | 3 leaves |
| Cucumber | 24 | 8 medium slices |
| Onion | 10 | 2 thin slices |
| Olive oil | 10 | 2 soup spoons |
| Main course: Cooked chicken | 80 | 1 serving spoon |
| Garnish: Tucupi broth | 200 | 3 Shells |
| Side dish: Rice | 100 | 4 soup spoons |
| Jambu | 40 | 1 cup |
| Drink: Mango juice | 250 | 1 glass |
| Dessert: Tangerine | 135 | 1 unit |

| 4th Menu | Salada cruza colorida | Quant. (g or mL) | Mẽdio casseria |
|----------|----------------------|-----------------|---------------|
| Appetizer: Lettuce | 20 | 3 chopped leaves |
| Ararula | 25 | 1/2 cup |
| Ricotta | 30 | 1/2 cup |
| Tomato | 40 | 2 soup spoons |
| Beef | 30 | 2 soup spoons |
| Carrot | 24 | 2 soup spoons |
| Olive oil | 10 | 1 soup spoons |

| Main course: Caruru | 140 | 2 serving spoon |
| Garnish: Regional shrimp | 30 | 6 unit |
| Side dish: White rice | 100 | 4 soup spoons |
| Drink: Orange juice | 250 | 1 cup |
| Dessert: Banana | 90 | 1 medium unit |
daily VET of 2000kcal. Regarding macronutrients, the total protein value was 13.6%, carbohydrate 59.1%, and 27.3% total lipids, whereas the fibers had a total value of 8.48g, thus considering a nutritionally satisfactory menu compared to the parameters described as can be seen in Figure 3. The protein content of this menu is similar to that of a yam cereal bar according to Dias et al [35].

4 CONCLUSION

The results of this study reinforce the need to analyze the composition of regional foods, especially those typical of each region of the country that is widely consumed by the local population, thus serving as a basic and essential tool for a more reliable assessment of individual food intake, groups or populations. The suggested lunch menus showed that the typical preparations can be eaten correctly amounts and balanced menus, it is important that there is a balance between the consumption of these preparations and the analyzed ingredients, including other foods rich in nutritional value, and may even provide benefits for health.

REFERÊNCIAS

1. Zuin LFS, Zuin PB. Alimentação é cultura - aspectos históricos e culturais que envolvem a alimentação e o ato de se alimentar. Nutrire: Nutrire: rev. Soc. Bras. Alim. Nutr. 2009 abr; 34 (1): 225-241. http://sban.cloudpainel.com.br/files/revistas_publicacoes/227.pdf

2. Santos VFN, Pascoal GB. Aspectos Gerais da Cultura Alimentar Paraense. RASBRAN - Revista da Associação Brasileira de Nutrição. 2013 Jan./Jun; 5 (1): 73-80. https://www.rasbran.com.br/rasbran/article/view/10/12

3. Cunha MA. Composição Química e Nutricional de Preparações de Origem Africana, Típicas da Culinária Baiana. [Dissertação]. Salvador/BA: Programa de Pós-Graduação em Ciência de Alimentos. Universidade Federal da Bahia, Bahia; 2010. p.78. https://repositorio.ufba.br/ri/bitstream/ri/8800/1/Manuela%20Alves%20da%20Cunha.pdf

4. Fidalgo JG. A Autenticidade da Gastronomia Paraense. [Trabalho de Conclusão de Curso, especialização] (Pós-Graduação em Padrões Gastronômicos). Universidade Anhembi Morumbi, São Paulo, 2007.p. 42. http://periodicos.anhembi.br/arquivos/trabalhos/363447.pdf

5. Santos MN, Santos A, Bandeira AT, Sarmento J. A Valorização da Gastronomia Tradicional Paraense como Forma de Desenvolvimento Local. 2016. Disponível em: https://repositorio.uniceub.br/jspui/handle/235/8887. Consulta em maio, 2020.

6. Bitter D, Bitar NP. Comida, trabalho e patrimônio. Notas sobre o ofício das baianas de acarajé e das tacacazeiras. Horizontes antropológicos. 2012. Jul/dez; 18 (38): 213-236. https://doi.org/10.1590/S0104-71832012000200009

7. Peccini R. A gastronomia e o turismo. Revista Rosa dos Ventos. 2013. Abr/jun; 5 (2): 206-217. http://www.ucs.br/etc/revistas/index.php/rosadosventos/article/view/1734/pdf_114
8. Sousa, P.L.C; Lopes, L.A; Ferreira, T.A.P.C. Composição Química-centesimal de Pratos Típicos Goianos com Teores Reduzidos de Gorduras e/ou Açúcares. [Trabalho de conclusão de curso]. Graduação em nutrição. Universidade Federal de Goiás, Goiânia, 2010. p.32. http://www.crn1.org.br/images/pdf/Elena_feijo/tec_alimentos.pdf

9. Santos PCP, Nespolo CR, Oliveira FA, Veríssimo CM, Vivan BD. Composição Centesimal e Valor Energético de Pratos Tradicionais do Rio Grande do Sul. Braz. J. Food Technol. 2009 Jan; 2 (1): 1-8. http://bjft.ital.sp.gov.br/especiais/especial_2009/v11_edesp_11.pdf

10. Costa L L. Gastronomia e Cultura: Um diálogo gastronômico através da cozinha paraense. [Monografia]. Graduação em Produção Cultural. Universidade Federal Fluminense, Niterói, 2011. p.54. http://tagcultural.com.br/wpcontent/uploads/2012/04/0048.pdf

11. AOAC. 2017. Association of Official Analytical Chemists. Official Methods of Analysis of AOAC International, 20th Edition, Gaithersburg, USA

12. Van Soest PJ. Development of a comprehensive system of feed analysis and its application to forage. Journal Animal Science, 1967 Jan; 26 (1): 119-128. https://doi.org/10.2527/jas1967.261119x

13. Bligh EG, Dyer WJ. A rapid method of total lipid extraction and purification. Canadian Journal of Biochemistry and Physiology, 1959 Sep; 37(8): 911-917, https://doi.org/10.1139/y59-099

14. Brasil. Agência Nacional de Vigilância Sanitária. Resolução RDC n° 360, de 23 de dezembro de 2003. Aprova Regulamento Técnico sobre Rotulagem Nutricional de Alimentos Embalados, tornando obrigatória a rotulagem nutricional. Diário Oficial da União, Brasília, DF, 2003. http://portal.anvisa.gov.br/documents/33880/2568070/res0360_23_12_2003.pdf/5d4fc713-9c66-4512-b3c1-afec57e7d9bc

15. Núcleo de Estudo e Pesquisas em Alimentação – NEPA. Tabela Brasileira de composição de Alimentos - TACO. 4 ed. Campinas: NEPA-UNICAMP, 2011. P.161. https://www.cfn.org.br/wp-content/uploads/2017/03/taco_4_edicao_ampliada_e_revisada.pdf

16. Brasil. Ministério da Saúde. Instituto Brasileiro de Geografia Estatística. Pesquisa de Orçamentos Familiares 2008-2009. Tabelas de Composição Nutricional dos Alimentos Mais Consumidos no Brasil. Rio de Janeiro: IBGE, 2011. P. 351. https://biblioteca.ibge.gov.br/visualizacao/livros/liv50063.pdf

17. Costa ES. Rendimento e Características Físico-Químicas da Carne do Camarão Macrobrachium amazonicum e do Caranguejo Dilocarcinus pagei. [Dissertação]. Mestrado em Ciência e tecnologia para recursos amazônicos. Programa de Pós-Graduação em Ciência e Tecnologia para Recursos Amazônicos, Universidade Federal do Amazonas, Itacoatiara, 2015. p.83. https://tede.ufam.edu.br/handle/tede/4727

18. Franco BDGM, Landgraf M. Microbiologia dos Alimentos. Colaboradora Maria Teresa Destro. São Paulo: Editora Atheneu, 2008. 196p

19. Santos, RM; Souza JF, Reis IAO, Nunes, ML. Avaliação físico-química e nutricional do Macrobrachium olfessi sob a formas in natura e salgado cozido. Scientia Plena, 2011 out; 7(10): 1-4, https://www.scientiaplena.org.br/sp/article/view/386/308
20. Shamshad SI, Nisa KU, Riaz M, Zuberi R. Shelf life of shrimp (Penaeus merguiensis) stored at different temperature. Journal of Food Science, 1990 Sep; 55(5): 1201-1205. https://doi.org/10.1111/j.1365-2621.1990.tb03898.x

21. Brasil. Decreto nº 9013, de 29 de março de 2017. Dispõem sobre a inspeção industrial e sanitária de produtos de origem animal. Diário Oficial da União, Brasília, DF, 30 mar. 2017. Seção 1. http://www.planalto.gov.br/ccivil_03/_ato2015-2018/2017/decreto/d9013.htm

22. Bernardino M.A. Caracterização e aplicação da farinha do bagaço da cana-de-açúcar em bolo. [Dissertação]. Mestrado em Ciência da Engenharia de Alimentos. Faculdade de Zootecnia e Engenharia de Alimentos, Universidade de São Paulo, Pirassununga, 2011. p.85. https://teses.usp.br/teses/disponiveis/74/74132/tde-17112011-104853/pt-br.php

23. Furuya WM et al. Composição centesimal e perfil de ácidos graxos do camarão-d’água-doce. Revista Brasileira de Zootecnia, 2006 Ago; 35(4): 1577-80, https://doi.org/10.11606/D.74.2011.tde-17112011-104853

24. Silva, A.F. et al. Avaliação sensorial e composição proximal de camarões de água doce Macrobrachium rosenbergii defumados. Ciência Animal Brasileira, 2010 Dez; 11(4): 770-774. https://doi.org/10.5216/cab.v11i4.4221

25. Santos PCP, Nespolo CR, Oliveira FA, Veríssimo CM, Bortolini ACM. Análise Direta e Indireta de Nutrientes e Valor Energético de Pratos Salgados Tradicionais do Sul do Brasil. Científica Ciências Biológicas e da Saúde, 2011 Jul; 13 (1): 45-54. https://doi.org/10.17921/2447-8938.2011v13n1p%25p

26. Tavares, TS. Extrusados de Camarão Regional (Macrobrachium amazonicum), Quirera de Arroz e Arroz Polido Triturado. [Dissertação]. Mestrado em Ciência e Tecnologia de Alimentos. Programa de Pós-Graduação em Ciência e Tecnologia de Alimentos, Universidade Federal do Pará, Belém, 2010. p.115, http://ppgcta.propesp.ufpa.br/ARQUIVOS/dissertacoes/2010/Thiago%20Tavares.pdf

27. Dias GC, Silva AP, Spinelli MGN, Abreu ES. Teores de lipídios em refeições oferecidas em uma praça de alimentação de uma universidade privada do município de São Paulo. Simbiologias, 2011 Dez; 4(6), 163-175. https://www.ibb.unesp.br/Ensino/departamentos/educacao/revisistasimbiologias/teores-de-lipidios-em-refeicoes-oferecidas-em-uma-praca-de-alimentacao-de-uma-universidade-privada.pdf

28. Gioielli LA. Óleos e gorduras vegetais: composição e tecnologia. Rev. bras. Farmacogn. 2020 Abr; 5(2): 211-232. https://doi.org/10.1590/S0102-695X1996000200008

29. Sousa APB, Lima FGS, Lima A. Propriedades Nutricionais do Maxixe e do Quiabo. Revista Saúde em Foco, 2015 Jan/Jul; 2(1): 113-129. http://www4.fsanet.com.br/revista/index.php/saudeemfoco/article/view/688

30. World health organization. Food and Agriculture Organization (WHO/FAO). Diet, nutrition and the prevention of chronic diseases. Geneva; 2003. https://apps.who.int/iris/bitstream/handle/10665/42665/WHO_TRS_916.pdf;jsessionid=E56E3410DA2FC2EEE29FA41470751D67?sequence=1

31. AMERICAN DIETETIC ASSOCIATION. Health implications of dietary fiber. J Am Diet Assoc. 2002 Jul;102(7):993-1000. https://doi.org/10.1016/s0002-8223(02)90228-2

Braz. J. of Develop., Curitiba, v. 6, n. 7, p.45676-45691 jul. 2020. ISSN 2525-8761
32. Silva MR, Silva MS, Silva PRM, Oliveira AG, Amador ACC, Naves MM. Composição em nutrientes e valor energético de pratos tradicionais de Goiás, Brasil. Ciênc Tecnol Aliment 2003;23:140-45. https://doi.org/10.1590/S0101-20612003000400026

33. Oliveira JAR, Matos YM, Lima SSB, Santos FO, Martins LHS. Caracterização Físico-Química de Pratos Típicos da Culinária Paraense Servidos em Pontos Comerciais de Belém/PA. In: Congresso Brasileiro de Ciência e Tecnologia de Alimentos. 25. 2016. Gramado. Anais...Gramado, 2016. http://www.ufrgs.br/sbctars-eventos/xxvcbcta/anais/files/781.pdf

34. BRASIL, Ministério do Trabalho e Emprego. Programa de Alimentação ao Trabalhador – PAT. Brasília, 2006. http://trabalho.gov.br/portal-mte

35. Dias JRR, Mendes FZC, Nolasco MVFM, Bogo D. Brazilian Journal of Development, Obtaining yam flour for the preparation of cereal bar as a food and functional supplement, Curitiba, v. 6, n. 3, p.15716-15735. DOI:10.34117/bjdv6n3