

# Dietary technique and acceptance of *rice* and *bean* preparations in food services in Rio de Janeiro

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## Abstract

**Introduction:** The intake of rice and beans during the last years showed a decrease of 40.5% and 26.4% among Brazilians. We believe that, with a better sensory quality on cooking of these foods, they would be better appreciated. **Objective:** To identify the method of preparing rice and beans and to analyze the sensory attributes. **Materials and methods:** Descriptive and quantitative study, conducted in 2011, in four restaurants with popular menus in Rio de Janeiro, including the formulation of technical data sheets of preparation and sensory acceptance tests of the preparation methods used by the restaurant's employees. **Results and discussion:** Different dietary techniques were clearly identified in the restaurants investigated regarding washing of the rice, temperature of the water used for cooking, the use of seasonings in the beans and the practice of letting it soak, as well as the bean thickening preparation. Regarding the sensory acceptance tests, most of the employees reported to “slightly like” the preparations, however, 34.1% (rice) and 36.7% (beans) reported they did not approve or eat them. **Conclusion:** It is necessary to review the methods for preparation of rice and beans with the objective of raising their consumption in restaurants.

**Key words:** *Oryza sativa*. Fabaceae. Sensory analysis. Food service. Collective feeding.

## Introduction

The eating habits of the population of different socioeconomic classes, both urban and rural, have undergone changes that can be attributed to social and economic change in developed societies<sup>1,2</sup>

The explanation for this change may be given, among other aspects, by the social and economic determinants, which are, respectively, the increase in the number of individuals who live alone, the urban lifestyle, eating out, the entry of women into the labor market, the lunch time set by companies, advertising strategies, in addition to the large production of prepackaged foods ready for consumption, which during their industrial processing have an addition of sugar, salt, unhealthy fats, preservatives, among others, forming the so called ultraprocessed foods.<sup>3-6</sup>

These events sound like an escape valve for those who claim to not have time to prepare their own food, and thus seek the convenience and speed of consumption of meals away from home.

We observe a decline in consumption of beans and rice preparations in recent years among Brazilians, 40.5% and 26.4%, respectively, as well as other *in natura* foods or foods minimally processed by industry. Conversely, the intake of ultraprocessed foods increased.<sup>4,7</sup> These data are worrisome because persistence in the consumption of foods rich in sugar and high in fat points to unfavorable trends in dietary pattern, especially for the development of chronic non-transmitted diseases.

Despite the decline in the consumption of *rice and beans*, they are still significant, especially among the lower classes. The class with higher income has a lower intake of these foods, because of the greater availability of funds and, consequently, greater purchasing different products.<sup>4</sup>

In collective feeding restaurants, we believe that the decline in consumption of traditional and basic foods in the Brazilian diet, such as *rice and beans*, may also be related to the sensory quality of the meals served. According to a study done by Mangabeira & Botelho,<sup>8</sup> restaurants that produce food on a large scale should focus more on understanding the expectations of its clientele in order to make the meal away from home more enjoyable by getting greater success in their care. The same study indicates that collective feeding restaurants should make the method of preparation of rice and beans more homemade-like, rescuing the taste of this traditional Brazilian mix, increasing the desire for these foods.

The aim of this study was to identify the dietary techniques employed in preparations of *rice and beans*, as well as to analyze their acceptance on collective restaurants in the city of Rio de Janeiro, Brazil.

## Materials and methods

Descriptive and quantitative study conducted between the months of May and July of the year 2011, in four popular restaurants, located in the municipality of Rio de Janeiro, where the authors' research and extension

projects activities are carried out. The structure of the menu is composed daily of two starters (soup and salad), main course and an option to the main course consisting of protein-based preparations, sides, rice and beans, dessert with a supply of fruit or sweets and beverage. The distribution system service is cafeteria portions, prepared by the waitresses. Three restaurants provide an average of 3,000 meals/day in a food and nutrition unit (UAN I, UAN II and UAN III), and UAN IV, with 4,500.

The study had the following steps: first, we prepared data sheets to evaluate the method of preparation of rice and beans, which contained information about: location of the restaurant, number of meals offered by the unit, date of collection, investigator's name, name of the person responsible for the preparation, ingredients and quantities used in the preparation and their respective brands, packaging and how many units were used in the preparation and the preparation technique employed. The sheet also presented gross and net weight, cooking factor and unit cost of each ingredient used, the type of income, nutrition facts and sensory analysis.

Then, we elaborated a survey to assess consumption habits, the frequency and sensory acceptance of these preparations, for 73 workers of the studied units. Testers were recruited according to the inclusion in research and extension projects mentioned, in addition to the interest in participating in the test. Cooks were excluded because they were responsible for carrying out the preparations.

The attributes evaluated by the hedonic scale were color, appearance, aroma, flavor and

consistency. To the form of sensory analysis we added a space for general considerations, so that the tasters could express their views on the preparations.

The data obtained in the acceptance test were submitted to a frequency distribution analysis.

## Results and discussion

The preparation of rice (*Oryza sativa* L.) and beans (*Phaseolus vulgaris* L.) is done by kitchen assistants under the supervision of the cooks or the chef. One of the first lessons learned by those who aspire to a career in restaurants is to prepare rice and beans, as they are considered simple preparations and "due to the fact that cooking seems to be a natural ability for all",<sup>10</sup> being linked to tasks of easy replacement.

### Preparation of rice and beans

Tables 1 and 2 show the results of the steps of the preparation technique of parboiled rice and black beans, where small differences are observed in the preparation method between restaurants (Tables 1 and 2).

The practice of initially washing the rice before cooking was observed in only three UANs. This practice involves possible loss of water-soluble nutritional components in polished rice, especially B complex vitamins, and does not interfere with the water absorption index.<sup>11</sup> Thus, it is assumed that the yield of the preparation will not be altered and that the softness of the grain is remains preserved.

**Table 1.** Comparison table of the stages of preparation of rice in popular restaurants. Rio de Janeiro, 2012.

UAN	Rice washing	Seasonings in cold water	Raw rice fried in oil	Rice added in room temperature	Rice in boiled water	Extra water addition
I	yes	yes	no	yes	no	no
II	yes	yes	no	no	yes	yes
III	no	yes	no	no	yes	no
IV	yes	yes	no	yes	no	no

**Table 2.** Comparison table of the stages of preparation of beans in popular restaurants. Rio de Janeiro, 2012.

UAN	Soaking	Use of soaking water
I	yes	yes
II	yes	no
III	yes	no
IV	no	no

In all restaurants, raw onion and garlic are added as seasonings to cold water along with the salt and oil before adding the rice. In none of the UANs the process of frying the raw rice in oil was observed. This is a procedure that prevents the rapid absorption of water by the grain, obtaining rice with “loose” appearance,<sup>12</sup> resulting in better acceptance and presentation of the preparation.

The addition of rice to the pot is done with water at room temperature or boiling. In UAN II, a further 16 liters of hot water were added after the addition of the rice in the water. The paddle utensil was used as a reference for the volume of water.

According to Ornellas,<sup>12</sup> when boiling water is added to rice, it is fully absorbed

by it, increasing its rate of absorption, thus altering its volume when compared to rice which receives an addition of water at room temperature.

In the process of preparing the beans, three of the UANs have the practice of letting the beans soaking overnight (mean time 5 hours), however, only one uses the soaking water for cooking. In UAN 4, the one with the higher food production, because it presents a restriction of physical space and equipment availability, the cooks performed the first cooking with all the raw black beans that would be used for the menu of the day with minimal water, initially aiming to soften the grain. After reaching the proper softness, the cooked grains were stored in tanks without adding water. In later stages, a part of it was macerated, water and whole grains were added, and they concluded with adding the seasonings, sauteed onion and garlic at the end of cooking.

The technique of soaking is important because it acts to decrease the antinutritional and flatulent components, increases the bioavailability of minerals, maintains the resistant starch which acts as soluble fiber, in addition to helping reduce the cooking time, for it interferes with the more homogeneous cooking of the grains.<sup>13</sup> The choice of the preparation technique can minimize complaints from diners about the preparations, especially those that, in common sense, are related to poor digestion.

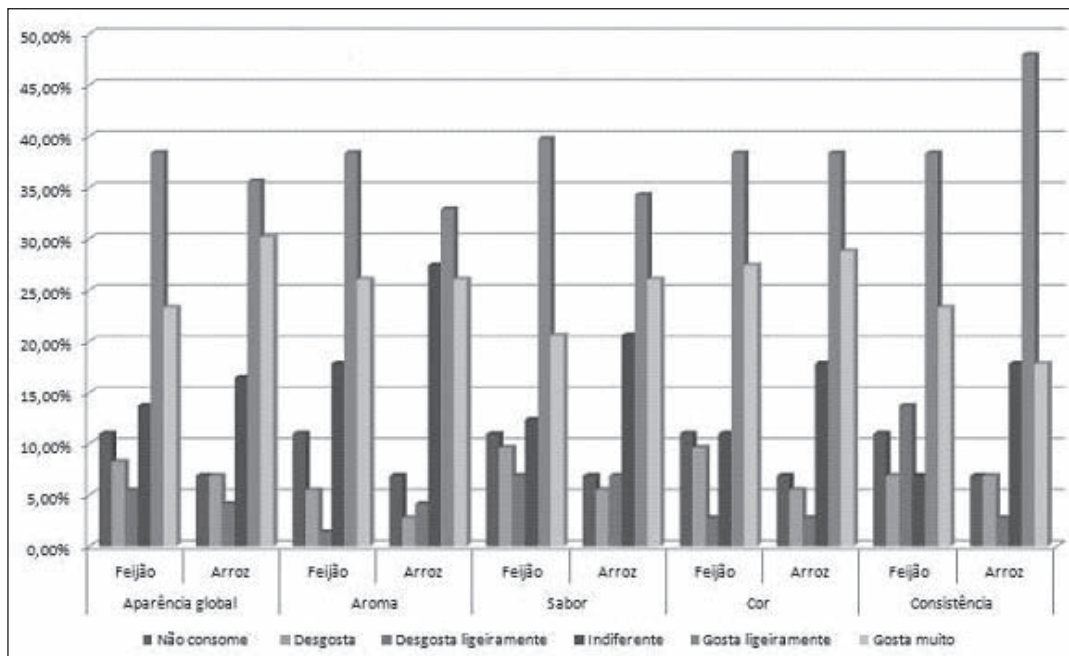
The seasonings (garlic and onion) are previously sauteed in two UANs, being that one of them ignores oil and adds salt. Only on UAN I the beans were thickened by blending a part of the grain and returning the paste to the cauldron.

The preparation technique need not be unique in all restaurants, but it needs to be planned, and adapted to the space and physical resources, customer preference and number of meals offered by the UAN, as well as sanitary laws. However, the UAN, when standardizing the preparation technique, ensures the maintenance of sanitary, sensory and nutritional qualities, which can be reproduced by employees of different shifts, preventing thus the “variability in the manufacturing process and hence losses in quality and productivity”.<sup>14,15</sup>

## Sensory Acceptance Test

Figure 1 presents the percentage of acceptance of *rice and beans* preparations, by sensory attribute, among workers of the restaurants studied.

The sensory attributes – *aroma, flavor, overall appearance, color and consistency* – evaluated in *rice* preparation presented, among the answer choices, the greater acceptance of “slightly enjoyed” (32.8% to 47.9%) from the respondents. However, for the consistency attribute, 17.8% reported “strongly enjoyed”, as well as “indifferent.”



**Figure 1.** Sensory acceptance of *rice* and *beans* preparations among workers in popular restaurants. Rio de Janeiro, 2011.

The sensory acceptance test of beans preparation showed the same pattern of analysis as rice preparation, in which the “strongly enjoyed” was also the alternative with the highest percentage of responses – 38.3% for aroma, overall appearance, color and consistency; and 39.7% for flavor.

Although in the sensory acceptance test most employees have reported enjoying the preparations, 6.8% and 10.9% do not consume rice and beans, respectively. The four attributes – *overall appearance, aroma, flavor and color* – had a higher “dislike” rate for *beans*

(8.2%, 5.5%, 9.6%, 9.6%) when compared to ratings of *rice* preparation (6.8%, 2.7%, 5.5%, 5.5%, respectively).

In the case of *beans*, workers noted that there no preparation quality standard, therefore is presents different consistency and flavor throughout the meal due to the lack or excess of seasonings and/or diluting the preparation to be serviced in the hours next to the end of the lunch time, which may discourage the consumption of preparations.

Another important point, though not evaluated in this study, is that the acceptability

of the beans may be further influenced by the storage mode of the grain waiting to be sold or stocked at the restaurant. Some studies<sup>16,17</sup> show that the improper storage of these foods can cause difficulty cooking or the hard-to-cook effect. This effect is responsible for increase in the baking of those grains which, nutritionally, can lead to loss of nutrients and conformational changes of some components. Factors such as temperature and humidity are also related to the appearance of this effect.

The environment is also able to influence the acceptability of the beans. According to Bertoldo et al.,<sup>18</sup> it can make a kind of natural selection of grains showing agronomic characteristics insensitive to different places of cultivation, causing improvement in grain yield and consequently, possible nutritional and sensory improvements.

## Conclusion

Preparations of rice and beans, due to being of low complexity and routine among the UAN production processes, tend to become a mechanized action devoid of flavor and preparation that do not consider the cultural force that both preparations represent to the population.

The revision and standardization of dietary techniques of such preparations may prevent unsatisfactory evaluations and collaborate for greater acceptance and consumption of both.

In order to contribute to the increased consumption of rice and beans, it is necessary, in the UANs, more attention and improvement of preparation techniques, approaching homemade productions that are seen as dainty and of high quality on the part of those who consume them, thus increasing their demand.

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