

Revista



Sustainable techniques used in food preparation

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ABSTRACT

In the globe, in the 21st century, millions of people are in malnutrition. In parallel, in the different food production units, as well as in the domestic environment, large losses occur from production to consumption. Studies have been conducted to minimize this serious scenario, which profoundly undermines sustainability and worsens the situation of vulnerable populations. The globalized world allows the contact and exchange of different food experiences and, therefore, the possibility of adopting sustainable culinary techniques. This work aimed to insert in some preparations the traditional and secular knowledge of some cultures, minimizing food waste that is despised by the majority of the population. For this purpose, watermelon waste (*Citrullus lanatus* spp) were used, using bleaching techniques and the improvement of the palatability with the addition of the bittersweet sauce enriched with umami flavor obtained through the incorporation of the Dashi broth.

Keywords: Food waste. Nutritional value. Sustainable use of food.

Uso de técnicas sustentáveis no preparo da alimentação

RESUMO

Ainda no século XXI, milhões de pessoas encontram-se no flagelo da desnutrição. Paralelamente, nas diferentes unidades de produção do alimento, bem como no ambiente doméstico grandes perdas ocorrem desde a produção até o consumo. Estudos têm sido conduzidos para minimizar este grave cenário, que prejudica profundamente a sustentabilidade e agrava a situação das populações vulneráveis. O mundo globalizado permite o contato e o intercâmbio de experiências alimentares diferentes e, portanto, a possibilidade de adoção de técnicas de culinária sustentáveis. Este trabalho teve como objetivo inserir em algumas preparações o conhecimento tradicional e secular de algumas culturas minimizando o desperdício de alimentos, os quais são desprezados pela maioria da população. Para tanto, utilizou-se resíduos de casca de melancia (*Citrullus lanatus* spp), empregando-se técnicas de branqueamento e a melhora da palatabilidade com adição do molho agri-doce, enriquecido com sabor umami, obtido através da incorporação do caldo Dashi.

Palavras-chave : Desperdício de alimentos. Valor nutricional. Aproveitamento sustentável de alimentos.

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Introduction

According to the report on Food Insecurity (FAO, 2012), about 870 million people in the world are in malnutrition. The data also reveal that the rise in food prices has reached critical levels or desperate levels, especially for poor countries that need to import food to feed their populations. Parallel to this reality, an important aspect contributes to aggravate the global availability of food, the high loss rate, especially in the food distribution stages, which subtracts from the productive effort a considerable part of the production (BELIK, COSTA, 2012, CANTO, 2015).

In Brazil, spread in the territory with continental extension there are hundreds of fruit species. Dozens of poles, in regions of cultivation with distinct climatic and soil characteristics, supply the national market and are still part of the intense international trade, since in 2015 the top 20 cultivated fruits yielded around 40.953 million tons of fruits. Therefore, the country is definitely a paradise for this activity (BRAZILIAN FRUIT CULTURE YEARBOOK, 2017). However, post-harvest losses occur covering several causes, where mechanical injuries, diseases are observed.

Almeida et al. (2011) when typifying the losses that occurred with vegetables from the different groups, marketed in fairs, grocery stores, markets and supermarkets in the city of Areia-Paraíba, observed that at the moment of the product's disposal to the popular market, although there are several an expressive percentage of losses in this phase of the vegetable production chain, resulting from mechanical damage, due to inadequate packaging of the products and the interference of the state of conservation of the roads linking the rural properties to the urban area of the municipality. It is estimated that in this stage of the productive chain in this state, between the harvest and the final commercialization, the losses of the vegetables reach 10 to 80%.

In 1997, SESC began its urban harvesting program and, in 2000, it inaugurated its first food bank (BA) in the city of Rio de Janeiro, and then implemented units in Fortaleza (2001) and Recife (2003). In 2003, the projects took on a national dimension with the creation of the Mesa Brasil SESC project, being present in all Brazilian states of food banks or urban harvesting projects. The "Urban Harvest" aims at collecting and distributing food that would be wasted, but are fit for consumption, for social institutions. It is the link between those who have surplus food and social institutions that work with underprivileged segments of the population (RANGEL, 2016).

Taking barks, stalks, seeds, among others, is not usually part of the habit of human consumption. On the other hand, in public debates about the amount of food that is wasted in UK households, there is a tendency to blame the consumer or individualize the responsibilities for affecting change, this is a consequence of the process of constant adjustment between the contingencies of life. And food consumption (EVANS, 2011). A study carried out in Portugal on household food waste found that the highest percentage was for "fruit peels, lumps, etc." (76%) and "vegetables (stalks, dried leaves or spoiled, etc.)" (59.04%). However, it was mentioned that these families sought to elaborate preparations with great creativity to reduce the loss of nutrients from a meal and to have a low-cost and high-tasting menu, since, with leaves and stalks (Carrot, turnip, beet, cauliflower, radish, broccoli, cabbage, watercress, and spinach) produced other preparations (ABDULGANIO, 2013).

In Brazil, however, the alternative to the use of residues can be an important option to add nutrients in the preparations and to be stimulating educational practices that allow reaching the objectives when it refers to healthy food, prevention of diseases and preservation of the environment. At present, research and extension projects work with communities or social groups that present socio-economic fragility in order to develop knowledge and provide ideas that lead to changes in habits of the population to use in daily consumption what was previously considered junk (PADILHA et al. To 2014, CARVALHO, BASSO, 2016). Art has evolved throughout history, becoming part of specific cultures, creating the trademark of each people. Terroir, culinary preparations, and beverages vary from region to region and it is not only the ingredients but also the techniques of preparation, the presentation form, the utensils used and specific to meet their culinary proposal, among other aspects of civilization (LISBOA, SIMONIAN, 2011).

With the deep and recent transformations through which the globalized, borderless world passes, the customs and eating practices of today's society are part of a historical and social context and are spreading and incorporating traditions. This can be well observed by Corção (2014) when analyzing Câmara Cascudo on the influences and incorporations of customs of various cultures and foods introduced with the industrialization to form the Brazilian food habit. This process allowed the incorporation and/or exchange of different ingredients and techniques so that the population could effectively know and produce culinary preparations. Classical cultures, among them the

so-called washoku - traditional Japanese cuisine is secular and seeks the potentialities of different food groups, caprice in preparation, brings imagination to the presentation of the meals, colors, textures and meticulousness that involves its preparation, exposes to whom It consumes a culinary differential, reduces disease risk, and is also associated with an essential spirit of respect for nature that is closely related to the sustainable use of natural resources (Suzuki et al., 2013, SHINOHARA, PADILHA, MATSUMOTO, 2014) And can serve as a scenario to create preparations with these food residues and thus avoid waste. This work had the objective of inserting in the preparations the knowledge consecrated of this culture, using food residues that are despised by the majority of the western population and that, according to available literature, it contains high nutrient content, with functional properties, besides being an important call for sustainability.

Materials and Methods

Professors of Alternative Cuisine and Asian Cuisine subject of the Bachelor's Degree in Gastronomy at Federal Rural University of Pernambuco, in partnership with chefs of consolidated expertise in the classic Asian cuisine, have been developing gastronomic preparations taking into account the integral use of food, respecting cultural, economic, regional, social and environmental dimensions. In addition to developing a basic education respecting the sustainability in order to provoke a discussion and clarify the population that this nutrient-rich food waste can still, with proper operational practices, produce a healthy diet both from the point of view of good production practices As developing preparations that the community does not know or only knows through the media.

Investigating the use of these products searched to produce preparations that in addition to using the residues of the fruit, also adopted the technique of a traditional and millenarian cuisine. Therefore, he based on Asian cuisine by developing techniques from a Japanese chef.

Physical and chemical analyzes were also carried out to obtain the centesimal composition of the food residue, which included determination of moisture content, ashes, protein determination, total carbohydrates and total lipids. The physical-chemical tests were performed in triplicate and according to methodologies of the Adolfo Lutz Institute (2008).

This study was based on a descriptive-exploratory bibliographical review, which searched

specialized literature from national and international official legislators, specialized books that dealt with food residues associated with sustainable culinary techniques.

Results and Discussion

Brazil is the third largest producer of fruit in the world, of which 65% is consumed internally and 35% is destined for the foreign market. The states that produce the most fruits in Brazil (São Paulo, Bahia, Minas Gerais, Rio Grande do Sul and Paraná) are not necessarily the ones that export the most. Among the major exporters in the country are four states in the Nordeste: Ceará (10), Rio Grande do Norte (20), Bahia (30), São Paulo (40), and Pernambuco (50). The Brazilian fruit sector estimates that production could reach 44 million tons in 2017, based on data from the Brazilian Institute of Geography and Statistics (IBGE) and export fruit growers. (BRAZILIAN FRUIT CULTURE YEARBOOK, 2017).

According to Rangel (2016), it is a fact that the network of public equipment to support the production, supply, and consumption of food are part of a strategic action of the National Food and Nutrition Security Policy, contributing to the reduction of food insecurity rates of the population, besides Promote access to adequate and healthy food. It is an important equipment that substantializes the greater ideal of the right to adequate food, in which quantity and quality dialogue to establish minimum access to essential nutrients for human development.

It is known that the disposal of food waste involves the waste of money due to lack of knowledge or incorrect management, induces incomplete nutritional use, and generates a serious environmental impact (PISTORELLO, CONTO, ZARO, 2015). On the other hand, it is also possible to use them by techniques that can be used to produce recipes that produce foods that are acceptable to consumers (DANTAS et al., 2015).

This research used parts of the watermelon. The fruit originates from the African continent, grown in several countries around the world and according to the FAO (2014), the world production of watermelon in 2012 was 105.4 million tons, grown in 3.5 million hectares, which provided An average yield of 30.1 t ha⁻¹. Today in Brazil, watermelon is one of the most representative fruits when it comes to exports. In 2015, the largest fruit producers in Brazil were Rio Grande do Sul, Bahia, Tocantins, São Paulo and Goiás, with a production of over 2.1 million tons (ANUÁRIO BRASILEIRO DE FRUTICULTURA, 2017).

The watermelon has great socio-economic importance, being cultivated mainly by small farmers and being of the low cost of production. The fruit is a berry that varies in shape, size, color, thickness of the bark (albedo and flavedo), pulp color, color and size of seeds. The cultivated watermelon varieties have fruits of different sizes - 1 kg to more than 30 kg -, shapes - circular, elliptic, broad and elongated - colors of the outer surface - cane green, light green, dark green, yellow, with or without stripes - and internal - red, pink, yellow and white - and countless flavors. The pulp is formed of placental tissue, which is the main edible part of the fruit. This tissue has a red coloration due to the presence of lycopene or yellowish as a result of the presence of carotenes and xanthophylls. The texture watermelon pulp is classified as soft or firm - or crunchy. Soft pulp cultivars are highly appreciated in the national market. However, this fruit can have a high content of waste reaching around 47% (DIAS; RESENDE, 2010; PEREIRA, 2016).

In the preparations produced with the watermelon residues, a gastronomic trip was made by the traditional Japanese cuisine, so that it could be used, and it was tried not to lose the essence of the original preparation, as well as to make the most of the nutritional value of the food that would be neglected, in addition to obtaining a low cost preparation.

Japanese cuisine, characterized by its taste and appearance in harmony with nature, has long been recognized as a traditional, elegant and different cuisine. With globalization, this kitchen has been attracting and disseminating unprecedented knowledge, attracting attention from all over the world, mainly for its doctrine of healthy eating, favoring longevity (FUKUOKA, 2009).

In Brazil, since the first immigrants landed in 1908 aboard the ship *Kasato Maru*, Japanese cuisine has taken a path, analogous to the trends that were taking place all over the world and was gaining ground and becoming popular among Brazilians. Today, dishes that use Japanese cooking techniques are served in most cities throughout Brazil. This kitchen is supported by a triad: rice, vegetables, and animal protein, fundamentally fish (KATO et al., 2016).

As for the vegetables these are very appreciated and prepared in several variants. Thus, the sunomono preparations can be observed in Figures 01 and 02. These were elaborated with recipes that are normally used in restaurants specializing in oriental food in Brazil, which is prepared from the cucumber. However, in the word etymology, in Japanese "su" means vinegar and "monkey" any

food or fraction thereof, so sunomono is a culinary preparation that derived from various forms of flavors. In Brazil the preference is in the balance of acid taste in association with the sweet taste, producing the bittersweet taste, very common in this culture.

Figure 01 – Sunomono of pulp and albedo in natura, of watermelon and decorated with roasted sesame.



Source: Chef Masayoshi Matsumoto, 2013.

Figure 02 – Sunomono of albedo and flavedo of watermelon, cooked and decorated with black sesame.



Source: Chef Masayoshi Matsumoto, 2013.

The foods were handled appropriately following Asian culinary techniques of cutting and cooking and so that the natural flavor and nutritional qualities were preserved. When cutting the residues of the fruit one opted to apply a form that better symbolized the exuberance of nature. As for the temperament, this was used to water the parts of the fruit with the amazú sauce (Broth with kombu and katsuobushi seaweed) basic source of umami taste, where kombu kelp contains glutamic acid and katsuobushi contains inosinic acid (SHINOHARA, PADILHA, MATSUMOTO, 2014), acids widely used in the food industry, trying to give a subtle enhancement in order to balance the taste of sugar

and salt that were added with much parsimony, since according to Kina (2005) the first was used to awaken the "hidden taste" of the foods and according to McGee (2011), the salt promotes the softening of the vegetables because the sodium ions displace the calcium ions that interconnect the molecules of intercellular mortar of the vegetables, with that the cross-links break down and the hemicellulose dissolves faster, Promoting the alteration of the original texture. The subsequent incorporation of dashi broth, acetic acid and sucrose characterize the bittersweet taste, rich in umami.

The preparation followed two paths. In Figure 01, a preparation using pulp and albedo is observed. In the preparation of Figure 02, the used parts of the fruit, which were bleached, consisted of albedo and flavedo. In both, the amazu sauce was used to finish with the use of black sesame.

Table 01 – Average values of the centesimal composition of peel (Albedo and Flavedo) of Cucurbitaceae, species *Citrullus lanatus* in Watermelon.

Food	Amount (g)	Humidity and Volatile Substances (%)	Ashes (%)	Calories	Carbohidrats (g)	Protein (g)	Lipidis (g)
Watermelon	100	93	0,61	14,21	2,18	0,97	0,29

Source: Author

Mendes (2013) developed biscuits from pineapple peel and mango flour and confirmed to be a viable alternative for the supplementation and/or supplementation of important nutrients in the food,

Physicochemical analyzes were also performed to obtain the centesimal composition of the watermelon peel - albedo and flavedo, together (Table 01).

This residue as observed in the centesimal composition of nutrients (Table 01) determined in this research shows a nutritional value that is similar to some vegetables as shown in Table 02 (TACO, 2011). It can contribute as a substitute of some of these foods and complement some meals or be participating in new formulations.

Marques et al. (2010) studied the centesimal composition of the mango peel and showed its nutritional importance and the possibility of the use of this part, previously considered inedible in the Brazilian diet.

and can be used as ingredients in the preparation of new food products. And they say that this type of food should be encouraged in the day to day

Table 02 - Centesimal composition of some vegetables. Source: Taco, 2011.

Food	Amount (g)	Humidity and Volatile Substances (%)	Ashes (%)	Calories	Carbohidrats (g)	Protein (g)	Lipidis (g)
Raw lettuce	100	95,0	0,8	14,0	2,4	1,7	0,1
Chayote	100	94,8	0,3	17,0	4,1	0,7	0,1
Spinach	100	94,0	1,2	16,0	2,6	2,0	0,2
Cucumber	100	96,8	0,3	10,0	2,0	0,9	Tr
Radish	100	14,0	0,7	14,0	2,7	1,4	0,1

When comparing the centesimal composition of these plants with the watermelon residue, quantities of nutrients that resemble the quantities of the foods in Table 02 are observed, allowing their use as a food component to replace the plants mentioned.

Conclusions

Food waste from some fruits can become garnish for some meals or constituents of new food formulas;

The food residue of the watermelon can be an excellent ingredient for new preparations with a

composition centesimal that is comparable to some vegetables;

Daily preparations of a millenary culture can be innovative proposals, providing new sensations and creating different food products, which can be developed with the purpose of reducing the large percentage of food waste, as well as taking advantage of the diversity of waste that is despised by the population;

By using creativity in the incorporation of residues, one can obtain quite satisfactory results in the offer and acceptance of these, which besides being nutritious and attractive, can be elaborated using sustainable practices.

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