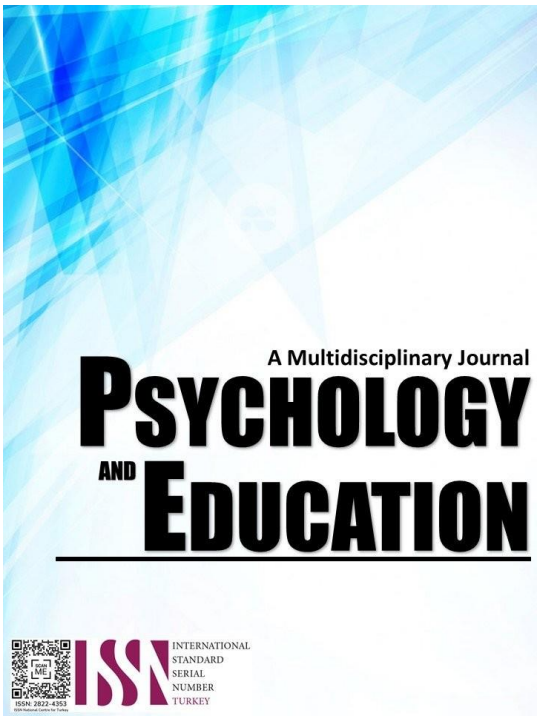
DEVELOPMENT OF MALUNGGAY (MORINGA OLEIFERA) AND KALABASA (CUCURBITA MAXIMA) IN BIBINGKA PREPARATION: TECHNOLOGY GUIDE



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Research Article

Development of Malunggay (Moringa Oleifera) and Kalabasa (Cucurbita Maxima) in Bibingka Preparation: Technology Guide

Jurren B. Lacson*
For affiliations and correspondence, see the last page.

Abstract

This study aimed to develop malunggay (Moringa oleifera) and kalabasa (Cucurbita maxima) in rice cake or bibingka preparation into traditional Filipino culinary fusion at Cebu Technological University -Barili Campus during the school year 2024-2025 as basis for techno-guide.This study utilized the combination of two research designs, namely experimental and descriptive methods that assessed the sensory analysis of bibingka utilizing malunggay and kalabasa as a main ingredient from T1 to T4 in terms of flavor, aroma, color, and texture.The trained panelists were the instructors while the untrained panelists were the college students which most of them were females and below 20 years old. Panelists consumed the bibingka weekly, contributing a nominal fee of 10 pesos for the product. All treatments used identical amounts of pulverized malunggay, varying only in the proportion of mashed kalabasa. The overall acceptability of the sensory revealed descriptive evaluation likely very much. The test of significance on the sensory quality found out all were rejecting hypothesis which were interpreted as significantly difference. The most preferred and acceptable production cost was the treatment 3 with the ratio of 10g pulverized malunggay leaves and 60g smash kalabasa. Therefore, new development helps achieve both aims of enhancing public health and rejuvenating traditional food customs, keeping bibingka important in modern diets.

Keywords: *Malunggay (Moringa oleifera), Kalabasa (Cucurbita maxima) Bibingka preparation, technology guide, descriptive method*

Introduction

It was evident in recent years that agriculture, particularly in the Philippines, has been our main source of support and has allowed the Filipino people to flourish and go on from their founding principles. One of the nation's greatest sources of pride, in fact, has been the encouragement and upbringing of several farmers who are passionate about growing crops and vegetables for the market to be consumed by the populace and the community. Consequently, farmers were seen as contributing to the notion that agriculture is the foundation of the economy (Barode, 2023). However, not all the time that farmers experiencing smooth and justifiable manner of economic cycle most especially if there were oversupply of those off-seasonal vegetables just like Malunggay and Kalabasa. By this unexpected phenomenon, many farmers most specifically in the mountain areas of Sitio Tal-ut, Barangay Valencia, Carcar City, Cebu faced significant loss of earnings since not all their harvested vegetables will be sold out in the market and instead results to decay and wastage.

To address these issues raised by the farmers of Sitio Tal-ut, bibingka preparation and innovation ideas suggests that this problem can be addressed and will be lessened aided by the existing food technologies and innovative ideas which has been practiced by some of the bibingka entrepreneurs wanted to earn a living and for daily consumption purposes. Moreover, some bibingka business owners assert that since people are naturally drawn to bibingka, having an inventive mind will not only support the community's ongoing progress but also sate customers' hunger. These explorations and innovations will surely give way to the market trend, if possible since Filipinos were fun of exploring foods and various delicacies that will satisfy their needs especially during summer or cold seasons. Exploring nutritional and functional potential of malunggay (Moringa oleifera) and kalabasa (Cucurbita maxima) in bibingka preparation can bring back the traditional Filipino culinary fusion. This food exploration and innovation is the developmental process of the new food products and production processes to find more nutritious food stuffs.

The current demand for healthy and sustainable food is driving the development of new alternatives to traditional culinary fusion. Improved foods can be created by reducing the amount of some ingredients with others. By innovating their products, bibingka entrepreneurs can offer healthier alternatives to a growing number of consumers interested in a balanced diet. To address the current demand for healthy lifestyle, thus the researcher tries to explore and innovate a new type of bibingka that will make malunggay and kalabasa as its unique flavor. This will not only be a great opportunity to make use of the abundance of malunggay and kalabasa in Sitio Tal-ut but also to provide a nutritious snack to those who are health -conscious or to those kids and aged who refuse to eat vegetables. It can be a great way to introduce children into consuming vegetable in a fun and enjoyable way. Furthermore, it will also provide the vendors of Mantalongon, Barili, Cebu a new market for malunggay and kalabasa, thus avoiding wastage and increase income and profitability.

Bibingka is one of the many popular delicacies in the Philippines. Bibingka is a traditional Filipino rice cake made from rice flour, coconut milk, sugar, and eggs. It's typically cooked in banana leaves and served during special occasions or as a snack. There are many variations across different regions of the Philippines, some including toppings like salted eggs, cheese, or coconut shavings and a simpler version in Visayas region called “bingkang bisaya”. It's a delicious and popular treat in Filipino cuisine.

In Mantalongon, Barili, Cebu one of the delicacies they offer to tourist and motorist passing by their barangay is their delicious bibingka. Bibingka is typically made with rice flour, coconut milk, sugar, eggs, and baking powder. These ingredients are mixed to form a batter, which is then poured into banana leaves or molds and baked until golden brown or you can steam it. Optional ingredients such as salted eggs, cheese, or coconut shavings can be added for flavor variation. Kids eat this kind of food which is high in sugar, the less they like fresh and natural foods like fruits and vegetables (Fontevecchia, 2018). Innovating bibingka by incorporating malunggay and kalabasa as a flavor will provide a healthier alternative than those traditional bibingka and kalabasa will serve as natural coloring agent to bibingka and will also add on to natural sweetness while malunggay will also give a layer of texture and flavor and offer nutritional value. It is also a way to introduce new and healthier flavors to people who are looking for something different.

It is within this perspective that the researcher was driven to conduct this study to explore the nutritional and functional potential of malunggay (Moringa oleifera) and kalabasa (Cucurbita maxima) in bibingka preparation: a scientific inquiry into traditional Filipino culinary fusion as an alternative flavor and ingredient of bibingka in terms of appearance, aroma, texture, taste and general acceptability. Also, to aid the community and farmers in dealing with an excess malunggay and kalabasa harvest.

Literature Review

Filipino native delicacies, known as kakanin, are popular snack foods that are usually served as merienda or desserts. Kakanin are native delicacies made of malagkit (glutinous rice), which comes in two varieties: the first-class variety that is sweet, rounded and white and the regular variety that is longish and translucent. The word kakanin is derived from kanin, Tagalog for rice. The three basic ingredients are malagkit or glutinous rice, coconut milk or gata, and sugar.

According to Calion (2018), Filipinos love of kakanin can be traced way back pre-colonial times when our ancestors used suman as offering to gods and visitors. Kakanin are usually present on special occasions such as weddings, birthdays, anniversaries, and fiesta. No celebration is complete without these kakanin being served in the table. They are especially popular during the Holiday Season and since Christmas and New Year is just around the bend. One popular kakanin here in the Philippines is Bibingka, Bibingka is a most sought after kakanin during Christmas Season traditionally served with salabat and sold alongside Puto Bumbong. It is a round rice cake made with galapong, sugar and coconut milk.

According to Marzani (2021) that Bibingka is a traditional Filipino rice cake that has been enjoyed for many generations in the Philippines. Its exact origins are not precisely documented, but it has been a part of Filipino culinary traditions for a long time. The dish is believed to have been influenced by early interactions with Chinese and Indonesian traders, as well as by Spanish colonial influences. Bibingka is typically made from rice flour, coconut milk, sugar, and eggs. It is traditionally cooked in a clay pot lined with banana leaves and topped with butter, cheese, and salted eggs. The cake is then baked in a wood-fired clay oven, giving it a unique flavor and texture. While the exact date of its invention is unknown, Bibingka has been a staple in Filipino cuisine for centuries and is commonly enjoyed during special occasions and holidays, particularly during the Christmas season.

Besa and Dorotan, (2019) mentioned that rice cake or bibingka is part of the cultural package of a place, just like the Filipino food that gives people a memorable experience when tasting the food and a gist of their culture. The best experience to taste the culture of the Philippines is to taste their best-known delicacies. The trait of a Filipino can also be revealed through the preparation of the food and serving as it reveals the character of the person, where one came from, and the personality he bestows. The traditional Filipino family eats more than the required number of meals a day, and they are known to be always offering food to their neighbors. Filipino cuisine is very resourceful because it uses almost every ingredient in the communal surroundings and turns it into a beautiful and tasty dish that will make the audience appreciate (Zappia, 2015).

Shiga, Ueda, Nagasako, Iwamoto, & Uematsu, (2015) bingka is that rounded rice cake that is made from rice flour and coconut milk on a banana leaf popular in southern Philippines. The snack's flavor resembles the savory bibingka of Cebu and is also popular in Indonesia. Travelling by road across Mindanao, we would often encounter bingka stalls in areas where rice and coconuts abound. If you travel from Davao to Butuan, the municipality of Nabunturan in Davao de Oro boasts an array of impressive bingka restaurants offering not only the snack but meals, clean restrooms and drinks to travelers between the Caraga and Davao regions.Travelling from Davao to General Santos or Kidapawan, you pass by Mers, a popular restaurant known for its bingka, and other delicacies apart from the wonderful lunch fare. Often the batch of bingka made for the day runs out by late afternoon due to the high demand.

Methodology

This study utilized the combination of two research designs, namely experimental and descriptive methods that assessed the sensory analysis of bibingka utilizing malunggay and kalabasa as a main ingredient from T1 to T4 in terms of flavor, aroma, color, and texture. The consumer panel of tasters focused on recognizing probable changes in flavor, aroma, texture, color, and general acceptability because of varying the quantity of various elements through observation and testing procedures. Thus, pre-trial formulation was made to develop a bibingka recipe using malunngay (Moringa oleifera) and kalabasa (Cucurbita maxima). The researcher incorporated these ingredients to enhance both nutrition and flavor. Here's a detailed product formulation for this variation such as 4 cups (500 grams) of rice flour for base structure and texture of the product, 2 cups (475mL) of coconut milk, 2 cups (475mL) of water to add moisture and flavor of the product, 1 ¼ cup (200 g) of granulated sugar to sweetens the batter being added to the product, 5g of baking powder as

leavening agent for rising the mixed ingredients, 1.5g of salt to enhance flavor, 20g of dried and powdered malunggay leaves to add nutritional value and unique flavor of the product, and 20g minced Kalabasa to add natural sweetness and texture. This formulation incorporates malunggay and kalabasa to add both nutritional value and unique flavors to traditional bibingka. Adjust quantities and ingredients based on taste and dietary

When developing a bibingka recipe with malunggay and kalabasa, a structured data gathering procedure helps ensure the product meets quality standards and consumer expectations Sensory Evaluation was used descriptive method in gathering of the data. To assess the taste, texture, color, aroma, flavor, and overall acceptability of the bibingka, the researcher selected 20 trained and 90 untrained panel from a diverse group of taste testers, including target consumers and food professionals at CTU-Barili Campus.

Results and Discussion

After a thorough analysis of the study, the researcher came up with the following findings:

The findings of the study showed that the respondents were categorized into trained panelists and untrained panelist. The trained panelists were the instructors while the untrained panelists were the college students which most of them were females and below 20 years old. They were consumed the rice cake or bibingka once a week and they paid 10 pesos. The findings revealed that the ingredient formulations of four treatments were the same amount of pulvurized malunggay leaves with different amount of smash kalabasa. As to the sensory evaluation of the four treatments, it was found out that in color, Treatment 2 and Treatment 3 were very satisfied while Treatment 1 and Treatment 4 were extremely satisfied. As to the aroma, Treatment 1, 3 and 4 were extremely satisfied while Treatment 2 was very satisfied, furthermore on the taste evaluation, Treatment 1, 2, 3 and 4 were extremely satisfied and on the flavor, Treatment 1, 2, 3 and were also extremely satisfied. The overall acceptability of the sensory revealed descriptive evaluation likely very much. The test of significance on the sensory quality found out all were rejecting hypothesis which were interpreted as significantly difference. The most preferred and acceptable production cost was the treatment 3 with the ratio of 10g pulverized malunggay leaves and 60g smash kalabasa.

Conclusions

To sum up, the research on developing bibingka with malunggay and kalabasa successfully blends these healthy components into a classic Filipino treat. The results show that these ingredients not only improve the nutritional value of bibingka, creating a healthier choice, but they also add a distinct taste and attractive color that can draw in more people. This technological manual is a helpful tool for home cooks and commercial producers, encouraging the utilization of local ingredients and safeguarding culinary traditions. In the end, this new development helps achieve both aims of enhancing public health and rejuvenating traditional food customs, keeping bibingka important in modern diets.The study opens opportunities for scaling the production of bibingka with malunggay and kalabasa for both local markets and health-conscious consumers.

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Affiliations and Corresponding Information

Jurren B. Lacson
Tal-ut National High School
Department of Education – Philippines