Acceptability Study of Banana Blossom (Banana Musa) Cupcake Fortified with Honey: A Bread Innovation

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Abstract

Purpose: The province of Quirino, Philippines, is a good source of the different varieties of banana. The purpose of this research is to determine the organoleptic assessment and acceptability of Banana blossom Cupcake fortified with Honey.

Methodology: The study utilized a descriptive survey method. Data were gathered through structured questionnaires and were assessed using a Likert scale. The questionnaires were distributed to 50 trained and untrained respondents who were faculty and students at Quirino State University. Sensory evaluation was employed on the Honey Banana Blossom Cupcake in terms of the following parameters: taste, texture, appearance, color, aroma, and presentation.

Main Findings: Generally, Honey Banana Blossom Cupcake is highly acceptable among the taster respondents particularly on its appearance, color, texture, and aroma where it was rated as moderately high while its flavor was rated as highly acceptable.

Implications of study: This study specifically addresses the use of banana blossoms to exploit its potential and to support local farmers and growers to maximize their profit

Novelty of study: This research aimed to produced policy to support local products in the province of Quirino.

INTRODUCTION

The food industry continually develops new products by keeping up with consumer preferences, which are shifting more and more toward ready-to-eat foods. Freshly cut fruits and vegetables are at the top of every consumer's list among these. Ergo, the market has expanded quickly in recent years due to changes in consumer behavior. Therefore, in order to attain general market acceptance, it is imperative to identify new approaches to product creation.

Since the beginning of mankind's civilization, bread has been a staple food that has been prepared using a wide range of ingredients and techniques (Vilasrao D.T. 2019). It was prepared using flour and water to produce dough and baked using an oven or the traditional wood fired oven or the so called pugon. The patisserie industry includes a wide range of breads and pastries. The sweet patisseries market is experiencing a wave of innovation that includes the revival of old classics, the rise of the individual portion, and new dining occasions to enjoy them. As a result, a subset of modern, urban "foodies" has emerged, who regard baking as a form of art, an extension of self.

The banana plant, widely regarded as nature's gift to mankind, is well known for its fruit due to its enormous nutritional and health benefits (Mohiuddin, et al. 2014), and the unnoticed banana blossom has potential to be regarded as a functional food or superfood due to its high nutrient content. Despite of being such a wonder food it is still underrated in most part of the world. Therefore, it is the demand of present time to increase the awareness about banana blossom as it will not only reduce the banana waste but will also help people all over the world, reap its health benefits.

LITERATURE REVIEW

Banana is an edible fruit produced mainly in any tropical country where the climate contributes to the flavor and quality enhancement of this fruit. It usually comes in many sizes and color depending on the planted variety. Accordingly, this fruit has been said to contribute a sum amount of money to the economic development of one’s country because of its ability of producing variety of products (Clark, J. 2015). Not only used as main dish but in bakery products as well. It has also been said that cultivating such plant will not require the producer to throw any waste since every part or so to say all parts of this tree has its own benefits. The leaves of it are used as traditional foil in the preparation of bibingka and in different finished products among Filipinos. The fact that its fruit is so delicious, it can be also used as part of the diet. Banana blossom is a part of banana plant that was proven edible.

In 135 countries and territories across the tropics and subtropics, bananas are being produced (Mishra, S., & Sutar, N. 2010). The majority producers are farmers who grow the crop for either home consumption or for local markets (Tiwari, S., & Shukla, S. 2015). Banana is the second most produced fruit after citrus. It has 16% contribution in the world’s total fruit production. It has also stated that India is the most or the largest producer of banana in the world estimating up to 27% of banana’s production. According to them the banana is useful in every part just like food, feed, pharmaceutical,
Tasnim, vitamin A, C and E. According to Alarcon et al. Horwood, Calderon, R. P., & Rola, A. C. 2003 ed lots of innovated food and malaria ide with more than 5.6 million small holders’ farmers’ dependent on it (Horwood, C. 2006; Rapsomanikis, G., 2015). In 2000, the banana sector contributed about 7% to the total value of production in agriculture. Banana is also one of the country’s top export earners. Banana (Musa sp.) is grown in all regions of the Philippines throughout the year (Calderon, R. P., & Rola, A. C. 2003), the first botanist in the Philippines, as variety compress. In Indonesia as Pisang Kepok, in Malaysia as Pisang Nipor, and in Thailand as Kluei Hin. Saba is the type of cultivar of edible and cultivated Musa balbisiana species (Valmayor et al. 2002). The banana bud or flower or blossom is a component in the inflorescence of the banana plant. The male and female flowers of the plant are both present but come out of the plant separately. The female flowers are the first to come out which then develops into fruits. The first 5-15 basal nodes or hands produce female flowers, and the upper digital nodes produce male flowers (Nann, K., & Swe, N., 2012).

The Philippine banana industry contributes significantly to the agriculture sector and the economy in general. Banana production is a source of income and employment in the countryside with more than 5.6 million small holders’ farmers’ dependent on it (Horwood, C. 2006; Rapsomanikis, G., 2015). In 2000, the banana sector contributed about 7% to the total value of production in agriculture. Banana is also one of the country’s top export earners. Banana (Musa sp.) is grown in all regions of the Philippines throughout the year (Calderon, R. P., & Rola, A. C. 2003), the first botanist in the Philippines, as variety compress. In Indonesia as Pisang Kepok, in Malaysia as Pisang Nipor, and in Thailand as Kluei Hin. Saba is the type of cultivar of edible and cultivated Musa balbisiana species (Valmayor et al. 2002). The banana bud or flower or blossom is a component in the inflorescence of the banana plant. The male and female flowers of the plant are both present but come out of the plant separately. The female flowers are the first to come out which then develops into fruits. The first 5-15 basal nodes or hands produce female flowers, and the upper digital nodes produce male flowers (Nann, K., & Swe, N., 2012).

Banana is grown commercially for its fruits. The various parts of the plant other than the fruit are also used for food, packaging, and other purposes. Banana bud (bracts and flowers), one of its parts, is eaten as boiled vegetable and is also used as an ingredient in an assortment of cuisines. Banana bud or inflorescence is one of the most important parts of the banana plant. Aside from its being a mere ingredient in vegetable preparations, it is also processed and exported as canned banana bud (De Vera 1992). Banana blossom is often consumed as a vegetable in many Asian countries such as Sri Lanka, Malaysia, Indonesia, and the Philippines (Wickramaratne, K. S., & Ramunukhaaraechi, S. L., 2005). It is consumed as a curry and as a boiled or deep-fried salad with rice and wheat bread. Banana blossom is widely considered to be a high-fiber source. Dietary fiber has demonstrated its benefits in health and disease prevention in medical nutrition therapy (Kendall, et al. 2010). Banana flowers are high in vitamin E and flavonoids, as well as dietary fibers, proteins, and unsaturated fatty acids. (Salvador L., 2018).

Banana flowers, similarly, to the fruits are an excellent source of potassium, plus the Vitamin A, C and E. According to research at the Chinese Academy of Tropical Agricultural Sciences (2009) which studied the flowers of musa paradisiaca, banana flowers have tremendous nutritional value. It was also reported that banana blossom extract possessed medicinal properties for diabetes (Alarcon et. al, 1998; Pari, L., & Maheswari, J.U. 1999) and malaria (Bagavan et. al, 2011). It is a good source of fiber and protein. The flowers contain a class of phytochemicals known as saponins. Saponins lower LDL, or bad cholesterol, boost our immunity against infection and are thought to inhibit the growth of cancer cells. They also have antioxidant activity and so can reduce our risk of chronic disease such as cardiovascular disease. Banana flowers are also an excellent source of flavonoids. These phytochemicals found in many plant-based foods help prevent damage to DNA cells by neutralizing free radicals. They also help lower cholesterol, anti-inflammatory, anticancer and anti-aging.

With the existing Banana Research and Development center and Banana Clonal propagation of Quirino State University, researchers from Quirino State University, young entrepreneurs, and bakery owners produced lots of innovated food products from its fruits. They developed food products such as fresh juices, chips, breads, liqueurs, and wines. Banana blossoms or the so-called banana heart a fleshy, hot pink flower with a tear-shaped that grows at the end of a cluster of banana fruit were limitedly consumed as viand or snacks. Now, the undermined banana blossoms were also used as a main ingredient in making banana blossom cupcake fortified with honey to enhance its nutritional content. The researchers aimed of developing products made of banana blossoms to maximize its potential that may lead to its standardization and commercialization

This study therefore leads into the development and production of Cupcake with incorporation of honey and banana blossom as the main ingredient and assesses its acceptability to the consumers.

CONCEPTUAL FRAMEWORK

![Figure 1: Shows the Paradigm of the study](https://mgesjournals.com/ijthr/)
Statement of the Problem

The purpose of this research is to determine the organoleptic assessment and acceptability of Banana blossom Cupcake fortified with Honey.

Specifically, it intends to:

1. Determine the level of acceptability of Banana blossom Cupcake fortified with Honey in terms of appearance, color, texture, aroma, presentation, taste
2. Established financial viability and profitability analysis of developed products
3. Established a proposed plan of action aligned on the 6 P’s project output (People Services, Products, Places & Partnerships, Publication, patents, and Policy)

METHODOLOGY

Composition and Processing of Honey Banana Blossom Cupcake

a. Raw Materials: Banana Blossom, All-purpose flour, Baking powder, Brown sugar, White sugar, Vanilla, Butter, Egg, Honey

b. Tools and Equipment: Oven, mixing bowls, utility bowls, rubber scraper, baking sheet, baking pan, wire whisk, spoon

c. Procedure:
   - Preheat oven to 375 degrees F (190 degrees C).
   - Banana blossom were soaked in water with salt, washed and squeezed.
   - Boil the banana blossom 3-5 minutes then chop using the food processor.
   - In a mixing bowl, stir together flour and baking powder. Set aside.
   - In a large bowl, cream together the butter and sugar until smooth. Beat in egg and vanilla. Gradually blend in the dry ingredients as well as the chopped banana blossom. Stir in gradually
   - Bake 20-25 minutes in the preheated oven, or until golden.

Research Design

The study utilized descriptive-survey method in characterizing the organoleptic assessment and acceptability of “banana blossom cupcake fortified with honey”.

Research Participants

The researcher used a random sampling from the faculty and students at Quirino State University in which both trained and untrained and is likewise included as respondents using the same technique of sampling.

Instrumentation

The instrument used in the study it was adapted from the study of Tariga, et al (2019). The result of the survey served as basis in crafting the rating scales. There were six parameters used which includes: Appearance, Color, Texture, Aroma, Presentation and Taste.

Data Gathering

Upon approval of the request to conduct the study, the researcher personally administered the questionnaire to the participants. Each participant was interviewed regarding their responses in the questionnaire.

Data Analysis

Mean and standard deviation were used to describe the appearance, color, flavor, texture, aroma, and overall evaluation of the product. The mean values described using the following guidelines.

RESULTS

Objective 1: This part presents the result of the product development which is the creation of the Honey Banana Blossom Cupcake. Hence it shows that the sensory evaluation tool that comprises the parameters in assessing the acceptability level of the developed product. Furthermore, discussions were highlighted as to possibility of the product to be commercialized.
Table 1: Point System

<table>
<thead>
<tr>
<th>Point</th>
<th>Mean</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.00-1.49</td>
<td>Very low</td>
</tr>
<tr>
<td>2</td>
<td>1.50-2.49</td>
<td>Low</td>
</tr>
<tr>
<td>3</td>
<td>2.50-3.49</td>
<td>Moderately high</td>
</tr>
<tr>
<td>4</td>
<td>3.50-4.49</td>
<td>Very high</td>
</tr>
<tr>
<td>5</td>
<td>4.50-5.00</td>
<td>Extremely high</td>
</tr>
</tbody>
</table>

Table 2: Level of Acceptability of the Honey Banana Blossom Cupcake

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Means</th>
<th>Standard division</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>2.95</td>
<td>0.61</td>
<td>Moderately high</td>
</tr>
<tr>
<td>Color</td>
<td>2.77</td>
<td>0.68</td>
<td>Moderately high</td>
</tr>
<tr>
<td>Flavor</td>
<td>3.52</td>
<td>0.53</td>
<td>Very high</td>
</tr>
<tr>
<td>Texture</td>
<td>3.14</td>
<td>0.57</td>
<td>Moderately high</td>
</tr>
<tr>
<td>Aroma</td>
<td>3.42</td>
<td>0.58</td>
<td>Moderately high</td>
</tr>
<tr>
<td>Overall</td>
<td>3.16</td>
<td>0.59</td>
<td>Moderately high</td>
</tr>
</tbody>
</table>

As gleaned on the table above, the Banana Blossom Cupcake fortified with honey garnered an overall mean of 3.16 with a description of Moderately High. Among the parameters given, Flavor is very high which means the product is acceptable. Meanwhile, the rest garnered a Moderately High as a descriptor. This shows that the product considering the given parameters is acceptable thus, its marketability is most likely high. Murray, J.M (2003) stresses that acceptability is a subjective measure based on hedonics (pleasure), which in turn is influenced by the sensory properties of the food, previous exposure to it and subsequent expectations, contextual factors, an individual’s culture, and physiological status.

However, observing from the table above, the color got the lowest mean which is 2.77 and a high standard deviation of 0.68 which only mean that the product is weak in this part of parameter. Hoppu, et al. (2020), explains how color affects the acceptability and palatability of food. Foods are frequently given color additives to improve their appearance, make up for natural variances in the raw ingredients or color loss during processing, and give flavor identities to foods.

Objective 2: Financial Viability and Profitability of Banana Blossom Cupcake fortified with honey

A. INPUT

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 medium size banana blossoms</td>
<td>45.00</td>
</tr>
<tr>
<td>2 cups honey</td>
<td>150.00</td>
</tr>
<tr>
<td>10 pcs egg</td>
<td>80.00</td>
</tr>
<tr>
<td>2 cups brown sugar</td>
<td>60.00</td>
</tr>
<tr>
<td>2 cups white sugar</td>
<td>75.00</td>
</tr>
<tr>
<td>6 cups all-purpose flour</td>
<td>80.00</td>
</tr>
<tr>
<td>3 tbsp. baking powder</td>
<td>5.00</td>
</tr>
<tr>
<td>1 cup butter</td>
<td>45.00</td>
</tr>
<tr>
<td>1 tbsp. vanilla</td>
<td>5.00</td>
</tr>
<tr>
<td>Cupcake cups (paper)</td>
<td>80.00</td>
</tr>
<tr>
<td>Box for cupcakes</td>
<td>120.00</td>
</tr>
<tr>
<td>LPG</td>
<td>80.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>825.00</strong></td>
</tr>
</tbody>
</table>

B. OUTPUT

- 128pcs Cupcakes: 1,512.00
- 6 pcs/box - (21 box X 72.00 per box)

C. NET INCOME (B-A): 687.00

D. RETURN ON INVESTMENT (Net Income/gross Expenses): 83 %
Objective 3: Established a proposed plan of action aligned on the 6 P’s project output (People Services, Products, Places & Partnerships, Publication, patents, and Policy)

CONCLUSION AND FUTURE WORKS

Based on the findings of the study, the following conclusions are drawn:

- The sensory evaluations of the respondent in the different variables range from moderately high to very high.
- The respondents’ category influences their evaluations in appearance and taste but has nothing to do on the other variables.
- There is a positive financial viability and profitability in the commercialization of Banana Blossom Cupcake fortified with honey.
- Market orientation should also be established consistently to discover and meet the needs and desires of customers.
- Local Policy on the commercialization of Banana Blossom Cupcake fortified with honey should be implemented.

ACKNOWLEDGMENT

The researchers are grateful to Quirino State University for the continuous support and guidance in all our research endeavors. This study could not have been realized without the help of the University Research and Development. Due thanks are also accorded to the respondents of this study.

REFERENCES


