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# EXPLORING BITTER GOURD AS A NUTRITIOUS AND INNOVATIVE BREAD SPREAD: A PROMISING ALTERNATIVE FOR HEALTH-CONSCIOUS CONSUMERS

**FLORINDA BAUTISTA**
fdbautista@earist.ph.education

## Abstract

Scientific evidence substantiates the anti-diabetic properties inherent in bitter gourd. In this study, the researchers used a descriptive research design to determine the potential of bitter gourd in preparing and developing alternative bread spreads. Results of the study implied that the majority of the respondents preferred chocolate, most respondents most likely tasted the bitterness of the bread spread, respondents preferred the freshness of aroma on bitter gourd. Therefore, in terms of level of satisfaction, there is enough evidence to reject the null hypothesis and interpret that there exists a significant difference between the two groups. This implies that the two groups have different interpretations or conclusions in Taste, Aroma, and Texture. Bitter Gourd cannot be used as an alternative ingredient in making nutritious bread spread. People still preferred the common bread spread like chocolate, peanut, and cheese, but as time passed, people looked forward to finding a new spread taste. The good quality of bitter gourd bread spread is through its aroma, marketability, and appearance based on the consumer respondents.

Keywords: bitter gourd, nutritious bread spread, consumers, anti-diabetic properties,

## Introduction

Ampalaya, or bitter Gourd, is lower in calories, fats, and carbohydrates that keep you full longer. Hence, it has many benefits for those suffering from diabetes and bad cholesterol that can boost your body's first line of defense against germs entering the body. These will be achieved by introducing it to the respondents using a bread spread. This product will show the effect of bitter Gourd spread in millennials who love to try something new and for those people who are health conscious.

The researchers decided to make the different types of spread more tasty and healthier so that everyone would benefit from it. Researchers created a spread out of Bitter Gourd or "Ampalaya."

The research aims to present a naturally nutritious and convenient product, appealing to health-conscious individuals by introducing a bitter gourd-based bread spread. Bitter Gourd, primarily known for its fruit's medicinal uses, has been overshadowed by its bitter taste. This oversight has led us to consider the numerous advantages of consuming bitter gourd spread.

To become useful to everyone, the researchers will make the bitter Gourd a main ingredient in spreading bread. The researchers will ensure that the bitter Gourd spread tastes delicious and suits everyone, especially kids and millennials.

Scientific evidence substantiates the anti-diabetic properties inherent in bitter Gourd. However, transforming raw fruits into finished products during the manufacturing process may

compromise these valuable health benefits. In this study, Charantia was utilized as a tea in subjects, and the findings affirm that our product effectively preserves the health advantages of bitter Gourd. When you consume Charantia, you can be confident that you benefit from 100% Ampalaya goodness.

Bitter Gourd stands out as one of the most extensively researched botanicals, with documented scientific reports attesting to its efficacy in lowering blood sugar levels. Since the 1960s, global research has consistently highlighted the essential compounds in the plant, particularly polypeptide-P, a plant insulin recognized for its blood sugar-lowering effects. The insulin-like benefits of these plant compounds have been a staple in the diets of many people with diabetes who incorporate ampalaya either as a vegetable or in tea form. The traditional use of bitter Gourd is further reinforced by contemporary scientific validation, making it the singularly most promising plant/herb for managing diabetes today—Philippine *Journal of Internal Medicine.*

Bitter Gourd, typically consumed in its green state, attains peak palatability before ripening, as its taste intensifies in bitterness with maturation. Removing seeds is a common practice to mitigate this bitterness, leaving behind a tender and soft skin once the fruit is cooked. Beyond its culinary attributes, Bitter Gourd holds significance for its extensively documented capacity to lower blood sugar levels. Enriched with fiber, iron, and potassium, this fruit harbors key compounds such as charantin, vicine, and polypeptide—p—recognized plant insulin. Numerous pre-clinical studies and limited clinical trials have linked these compounds to the fruit's commendable effects on blood sugar regulation.

The therapeutic potential of Bitter Gourd has spurred the development of various supplements catering to diabetic individuals, including Bitter Gourd tea and capsules derived from the fruit. As the prevalence of diabetes continues to rise across diverse demographics and geographic regions, Bitter Gourd stands poised as a promising, safe, and natural alternative for those seeking to manage elevated sugar levels effectively.

According to R. Rosales, MD, and R. Fernando, MD, Bitter Gourd is a crawling vine growing well in tropical countries, particularly the Philippines. The bitter Gourd is at once a staple ingredient in Filipino and Asian cuisine and a reliable home remedy for various illnesses, particularly diabetes.

Bitter Gourd is rich in iron, potassium, beta-carotene, and other nutrients. But aside from its role as a healthy food, bitter Gourd is especially valued by people with diabetes for its known anti-diabetes properties. The traditional remedy is made by pounding the raw fruits of bitter Gourd into a bitter liquid or by boiling the leaves and fruits for a few minutes; the resulting water is then drunk as an herbal tea.

"Ampalaya" fruit prepared as a tea is well tolerated and may be a useful dietary adjunct in treating type-2 diabetes. It has minor gastrointestinal side effects of increased bowel frequency but is beneficial to diabetic patients who are constipated.

A member of the family Cucurbitaceae, momordicus is the Latin word for bitter. Charantia species is the Greek word for "flower is beautiful." Technically, this is a vegetable, but some scholars call it a fruit. Although it is mainly cultivated for medicinal and culinary uses, it can also grow in the wild, like the United States Gulf Coast. Scientific studies have shown that dried fruits, leaves, and seeds of a Bitter Gourd were used to formulate nutritional nutrient supplements, herbal teas, and capsules to reduce blood sugar levels in people with diabetes.

## Methodology

In this study, the researchers used a descriptive research design to determine the potential of bitter gourd in preparing and developing alternative bread spreads. Descriptive research involves collecting data to test hypotheses or answer questions regarding the subject of the study consists in collecting data. The researcher based on two (2) sources of data: the respondent's ongoing observation and customer feedback gathered through a survey questionnaire.

The respondents are composed of two groups: the first group is the ampalaya eaters, and the second group is the non-ampalaya eaters, of which both groups are the students of EARIST in Sampaloc, Manila.

**Results and Design**

**Sub-Problem No. 1.**

**What is the extent of utilization of bread spread?**

***Table 5***
**Extent of Utilization of Bread Spread**

| Bread Spread | Weighted Mean | Verbal Interpretation | Rank |
|---|---|---|---|
| Bitter Gourd | 2.80 | Moderately Utilized | 5 |
| Cheese | 3.58 | Utilized | 3 |
| Chocolate | 4.08 | Utilized | 1 |
| Peanut Butter | 3.70 | Utilized | 2 |
| Egg | 3.06 | Moderately Utilized | 4 |

Table 5 shows the utilization of different types of bread spread. “Bitter Gourd” got a weighted mean of 2.80 with the lowest rank and a verbal interpretation of “Moderately Utilized.” While Chocolate got an average of 4.08 with the highest level and verbal interpretation of “Utilized.” This implies that the majority of the respondents preferred Chocolate.

Sub-Problem No. 4

**How do the respondent’s asses the proposed bitter gourd bread spread in terms of:**

### 4.1 Taste

**Table 4.1**

**Level of Assessment of Taste on Bitter Gourd as an alternative Bread Spread.**

| Sub questions | Ampalaya Eater | | Non-Ampalaya Eater | | Overall Mean | | Rank |
|---|---|---|---|---|---|---|---|
| | WM | VI | WM | VI | WM | VI | |
| Bitter | 4.64 | **E** | 3.72 | **VS** | 4.18 | **VS** | 1 |
| Sweet | 4.40 | **VS** | 3.92 | **VS** | 4.16 | **VS** | 2 |
| Salty | 3.48 | **S** | 2.44 | **LS** | 2.96 | **S** | 3 |
| **Grand Mean** | 4.17 | **VS** | 3.36 | **S** | 3.77 | **VS** | |

Table 4.1 reveals the level of assessment on Bitter gourd as an alternative bread spread regarding taste, “Bitter” got a weighted mean of 4.18 with a rank of 1 and interpreted as “Very Satisfactory”; “Sweet” got a weighted mean of 4.16 with a rank of 2 and interpreted as “Very Satisfactory;

Lastly, “Salty” got a weighted mean of 2.96 with a rank of 3 and was interpreted as “Taste.” Generally, the grand mean is 3.77 with a verbal interpretation of “Very satisfactory.” This implies that most respondents most likely tasted the bitterness of the bread spread.

### 4.2 Aroma

**Table 4.2**

**Level of Assessment of Aroma on Bitter Gourd as an Alternative Bread Spread**

| Sub questions | Ampalaya Eater | | Non-Ampalaya Eater | | Overall Mean | | Rank |
|---|---|---|---|---|---|---|---|
| | **WM** | **VI** | **WM** | **VI** | **WM** | **VI** | |
| Odorless | 4.76 | **E** | 3.52 | **VS** | 4.14 | **VS** | 2 |
| Scented | 4.60 | **E** | 3.40 | **S** | 4.0 | **VS** | 3 |
| Fresh | 4.76 | **E** | 3.72 | **VS** | 4.24 | **VS** | 1 |
| **Grand Mean** | 4.71 | **E** | 3.55 | **VS** | 4.13 | **VS** | |

Table 4.2 reveals that the level of assessment on Bitter gourd as an alternative bread spread regarding aroma, “Fresh” got a weighted mean of 4.24 with a rank of 1 and interpreted as “Very Satisfactory”; “Odorless” got a weighted mean of 4.14 with a rank of 2 and interpreted as “Very Satisfactory; Lastly “Scented” got a weighted mean of 4.00 with a rank of 3 and interpreted as “Aroma.” Generally, the grand mean is 4.13 with a verbal interpretation of “Very satisfactory.” This implies that most respondents preferred the freshness of aroma on bitter gourd.

### 4.3 Texture

**Table 4.4**

**Level of Assessment of Texture on Bitter Gourd as an Alternative Bread Spread**

| Sub questions | Ampalaya Eater | | Non-Ampalaya Eater | | Overall Mean | | Rank |
|---|---|---|---|---|---|---|---|
| | WM | VI | WM | VI | WM | VI | |
| Smooth | 4.64 | **E** | 3.84 | **VS** | 4.24 | **VS** | 1 |
| Sticky | 4.44 | **VS** | 3.68 | **VS** | 4.06 | **VS** | 3 |
| Soft | 4.52 | **E** | 3.80 | **VS** | 4.16 | **VS** | 2 |
| Rough | 4.28 | **VS** | 3.08 | **S** | 3.68 | **VS** | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Grand Mean** | 4.53 | **E** | 3.77 | **VS** | 4.15 | **VS** |

Table 4.3 reveals that the level of assessment on Bitter gourd as an alternative bread spread regarding texture, "Smooth" got a weighted mean of 4.24 with a rank of 1 and interpreted as "Very Satisfactory"; "Soft" got a weighted mean of 4.16 with a rank of 2 and interpreted as "Very Satisfactory; "Sticky" got a weighted mean of 4.06 with a rank of 3 and "Rough" got a weighted mean of 3.68 with a rank of 4 interpreted as "Texture." Generally, the grand mean is 4.15 with a verbal interpretation of "Very satisfactory." This implies that most respondents preferred the smooth texture of the bread spread.

**Sub-Problem No. 5**

**Is there a significant difference in the assessment of the group of respondents on the proposed bread spread as to the variables mentioned above?**

**Table 5**

**Post Analysis between assessments on the proposed Bitter Gourd as an alternative bread spread as to Taste, Aroma, and Texture.**

| Category | t-Value | Df | p-value | Decision | Interpretation |
|---|---|---|---|---|---|
| Taste | 4.487 | 48 | .000 | Reject Ho | Significant |
| Aroma | 5.068 | 48 | .000 | Reject Ho | Significant |
| Texture | 9.066 | 48 | .000 | Reject Ho | Significant |

**Note: α = 0.05; N = 50**

Table 5 indicates that the two types of respondents in terms of taste, aroma, and texture with regards to Ampalaya Eater and non-Ampalaya Eater on Bitter Gourd as an alternative Bread Spread with all p-values asymptotically equal to zero (p=.000) with the values lower than 0.05 level of significance. Therefore, there is enough evidence to reject the null hypothesis and interpret that there exists a significant difference between the two groups. This implies that the two groups have different interpretations or conclusions in Taste, Aroma, and Texture.

**Sub-Problem No. 6**

**What are the problems encountered by the respondents on bitter gourd as an alternative Bread Spread?**

| Problems Encountered | Weighted Mean | Verbal Interpretation | Rank |
|---|---|---|---|
| Tasteless | **2.20** | Least Encountered | 7 |
| Lack of Appearance | **2.14** | Least Encountered | 8 |
| Lack of Freshness | **2.28** | Least Encountered | 6 |
| Seasonal | **1.94** | Least Encountered | 10 |
| Brand representation | **2.12** | Least Encountered | 9 |
| Low quality bitter gourd | **4.22** | Encountered | 1 |
| Lack of Funds | **4.10** | Encountered | 3 |
| Suitable packaging | **4.12** | Encountered | 2 |
| Appealing | **3.80** | Encountered | 5 |
| Pricing | **3.92** | Encountered | 4 |
| **Overall** | **3.08** | Moderately Encountered | |

**Table 6**
**Problems Encountered by Respondents in Bitter Gourd**

**Table 6:** Problems encountered by the respondent in bitter gourd "Low quality of the bitter gourd" got a weighted mean of 4.22 with the highest rank and the verbal interpretation of "Encountered". While "Seasonal" got an oral understanding of "Least encountered" and a weighted mean of 1.94.

**Sub-Problem No. 7**

**How do the respondents assess the level of acceptability of Bitter Gourd as an alternative Bread Spread in terms of;**

**7.1 Price;**

***Table 7.1***

***Level of Acceptability on Bitter Gourd as an alternative Bread Spread in terms of Price.***

| Sub questions | Ampalaya Eater | Non-Ampalaya Eater | Overall Mean | Rank |
|---|---|---|---|---|

| | WM | VI | WM | VI | WM | VI | |
|---|---|---|---|---|---|---|---|
| Price Insensitive | 4.24 | **A** | 3.80 | **A** | 4.02 | **A** | 3 |
| Large quantity | 4.32 | **A** | 3.92 | **A** | 4.12 | **A** | 2 |
| Suitable price | 4.16 | **A** | 4.16 | **A** | 4.16 | **A** | 1 |
| **Grand Mean** | 4.24 | **A** | 3.96 | **A** | 4.10 | **A** | |

Table 7.1 reveals the level of acceptability as an alternative to Bread spread in terms of Pricing. “Suitable price” got a weighted mean of 4.16 with a rank of 1 and verbal interpretive as an “Acceptable”; Then “Large quantity” got a weighted mean of 4.12 with a rank of 2 and interpretative as an “Acceptable”; Lastly “Price insensitive” got a weighted mean 4.02 with the rank of 3 and interpretive as “Acceptable.” Generally, the grand mean is 4.10, with verbal interpretation as “Acceptable.”

**Table 7.2**

**Level of Acceptability on Bitter Gourd as an alternative Bread Spread in terms of Packaging.**

| **Sub questions** | **Ampalaya Eater** | | **Non-Ampalaya Eater** | | **Overall Mean** | | **Rank** |
|---|---|---|---|---|---|---|---|
| | **WM** | **VI** | **WM** | **VI** | **WM** | **VI** | |
| Presentable | 4.04 | **A** | 3.96 | **A** | 4.0 | **A** | 4 |
| Informative labeling & coding | 4.28 | **A** | 3.88 | **A** | 4.08 | **A** | 3 |
| Design | 4.16 | **A** | 4.16 | **A** | 4.16 | **A** | 2 |
| Reusable | 4.32 | **A** | 4.04 | **A** | 4.18 | **A** | 1 |
| **Grand Mean** | 4.20 | **A** | 3.96 | **A** | 4.12 | **A** | |

Table 7.2 shows the Acceptability on Bitter Gourd as an alternative Bread Spread in terms of Packaging regarding to “Reusable” got a weighted mean of 4.18 with the rank of 1 “Design”

got a weighted mean of 4.16 with the rank of 2. Then" Informative labeling encoding" got a weighted mean with the rank of 3/. Lastly "Presentable" got a weighted mean of 4.0 all of them have "Acceptable" interpretation. Generally, the grand mean is 4.12 with the verbal interpretation as "Acceptable"

**Table 7.3**

**Level of Acceptability on Bitter Gourd as an alternative Bread Spread in terms of Marketing.**

| Sub questions | Ampalaya Eater | | Non-Ampalaya Eater | | Overall Mean | | Rank |
|---|---|---|---|---|---|---|---|
| | WM | VI | WM | VI | WM | VI | |
| Advertisement | 4.24 | A | 3.80 | A | 4.02 | A | 3 |
| Commercial | 4.32 | A | 3.92 | A | 4.12 | A | 1.5 |
| Purchasing | 4.32 | A | 3.92 | A | 4.12 | A | 1.5 |
| **Grand Mean** | 4.29 | A | 4.12 | A | 4.08 | A | |

Table 7.3 reveals the acceptability of bitter Gourd as an alternative bread spread in terms of Marketing." Purchasing" & "Commercial" got a weighted mean of 4.12 with the same rank of 1.5 with verbal interpretation as "Acceptable." "Advertisement" got a weighted mean of 4.02 with a rank of 3 and interpretative as "Acceptable." Generally, the grand mean got a weighted mean of 4.08 and verbal interpretation as "Acceptable."

## Conclusions

Based on the findings, the following conclusions were derived:

a. Bitter Gourd cannot be used as an alternative ingredient in making nutritious bread spread. People still preferred the common bread spread like chocolate, peanut, and cheese, but as time passed, people looked forward to finding a new spread taste.
b. The good quality of bitter gourd bread spread is through its aroma, marketability, and appearance based on the consumer respondents.
c. There is a significant difference between the two respondents. There is enough evidence to reject the null hypothesis and interpret that there exists a significant difference between the two groups. This implies that the two groups have different interpretations or conclusions in Taste, Aroma, and Texture.

d. Bitter gourd bread spread based on the respondents in terms of its Price, Packaging, and Marketing.

e. Problems encountered during and after the preparation of bitter gourd bread spread was managed and handled successfully.

**Recommendations**

Based on the conclusions, the following recommendations were as a result of this drawn:

1. Sterilize/sanitize all the materials used before and after measuring the ingredients accurately and store the mixture in a cool place to obtain a quality and excellent product.
2. Bitter gourd bread spread still has to undergo further study and innovation to improve its level of acceptability.
3. Bitter gourd bread spread can be recommended to people who prepare organic food.
4. Bitter gourd bread spread can be introduced to entrepreneurs and the market as an innovative product.
5. Use the most accurate fruit and proportional amount of ingredients to improve its quality characteristics and acceptability.
6. The bitter Gourd that will be used as a main ingredient must come from the production without chemicals to ensure the buyer or/customer that it is edible.
7. Use the ingredients' precise amount to have the Bitter Gourd's quality characteristics.
8. Bitter Gourd has to be packed in a suitable packaging material for Bitter Gourd to maintain its temperature.

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