IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.311 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 12, Issue 5, May 2025

DOI: 10.17148/IARJSET.2025.125333

FORMULATION, ANALYSES AND ACCEPTABILITY OF BITTER GOURD-PINEAPPLE COOKIES

ROSE BETH C. ANDAYA, MAEd

Capiz State University, Roxas City, Capiz, Philippines

Abstract: Cookies are one of the best-known quick snack products. They are characterized by a formula high in sugar and shortening and low in water. The main ingredients of cookies are wheat, flour, fat, and sugar. This study evaluated the acceptability of bitter gourd-pineapple cookies focusing on sensory qualities, consumer preference, microbial safety, proximate analysis, and shelf life. The study utilized a developmental-experimental research method. Three different formulations were tested to determine variations in appearance, aroma, taste, and texture, employing a Completely Randomized Design (CRD) and the Nine-Point Hedonic Scale. A panel of trained evaluators and 100 consumer respondents assessed the samples, and data were statistically analyzed using mean scores and ANOVA at a 0.01 significance level. Among the three formulations, Treatment A, containing 25 g bitter gourd and 75 g pineapple , appeared as the most acceptable. It received the highest ratings in appearance,aroma, taste, and texture. The decreased amount of bitter gourd resulted in a more satisfying taste, making it the most preferred variant. Significant variations were observed in appearance,aroma, taste, texture, and overall acceptability. These results are consistent with previous research findings, suggesting that bitter gourd and pineapple can be effectively used as a main ingredients in cookies making. It can used improving their nutritional value. Microbial analysis showed that the product met food safety standards, confirming that it is safe for human consumption. Similarly, shelf-life testing revealed no signs of mold growth within the first 2 to 6 days. However, by days 7 to 14, spoilage indicators such as unpleasant odor and mold formation began to appear. Therefore, the product is best consumed fresh and should ideally be consumed within one week of production to ensure quality and safety.

Keywords: Bitter Gourd-Pineapple Cookies, Formulation, Analysis, General Acceptability, Sensory Qualities

I. INTRODUCTION

The Filipinos' love for baked goods is a reflection of the country's rich culinary heritage and cultural influences. From the sweet and fluffy pandesal to the colorful baked goodies a special hearts of Filipinos. Bakery product including bread,cookies, rolls, pastries and muffins are an integral part of diet widely consumed worldwide (Saeed et al. 2019) Kulkarmi, Nihir and Luv(2018) revealed that cookies are good carrier of nutrients like carbohydrate and fat which can enriched protein by partially replacing refined wheat flour with protein rich flour up to acceptable level. This study aimed to determine the acceptability of Bitter gourd-Pineapple Cookies Specifically, it aimed to: (1)determine the sensory qualities of bitter gourd-pineapple cookies in terms of appearance, aroma, taste, and texture; (2) determine the acceptability of bitter gourd-pineapple cookies leaves among the three (3) treatments in terms of appearance, aroma, taste, and texture;

II. METHODOLOGY

This study used the developmental-experimental method to investigate the acceptability of the formulation of Bitter gourd-Pineapple Cookies. The researcher manipulates and control variables for variation concomitant of dependent variable. Thus, this method used for formulation of bitter gourd Pineapple Cookies. The Complete Randomized Design (CRD) was used in the experiment, which involved group tests of Bitter gourd- Pineapple Cookies with successive replications to determine the cause of change. The study used various tools and equipment, including a stainless working table, measuring spoons, weighing scale, kitchen knife, mixing bowls, rubber scraper, chopping board, unit three-burner top stove with oven, , utility bowls, colander, and spoons.

The three different treatments (A, B, and C) were used in formulating Bitter gourd-Pineapple Cookies, with the primary variation being the proportion of cake flour, bitter gourd and pineapple. Treatment A with 25g bitter gourd, 75g pineapple. Treatment B with 50g bitter gourd, 50g pineapple. Treatment C with 75g bitter gourd, 25g pineapple. All treatments presence of nutritional benefits.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.311 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 12, Issue 5, May 2025

DOI: 10.17148/IARJSET.2025.125333

Table 1. Treatments used in making Squash Hopia with Moringa leaves.

Ingredients	Treatment A	Treatment B	Treatment C
Cake Flour	100 grams	100 grams	100 grams
Bitter gourd	25 grams	50 grams	75 grams
Pineapple	75 grams	50 grams	25grams
Brown Sugar	50 grams	50 grams	50 grams
Granulated Sugar	50 grams	50grams	50 grams
Butter	100grams	100 grams	100 grams
Salt	2 grams	2 grams	2 grams
Baking powder	2 grams	2 grams	2 grams
Whole egg	50grams	50 grams	50grams

The primary objective of these variations was to determine the ideal balance of bitter gourd and pineapple that enhanced the nutritional profile of cookies while maintaining its desired sensory attributes. The findings helped establish a nutritionally enhanced cookies variant that aligned with consumer preferences while offering improved functional food benefits.

III. RESULTS AND DISCUSSION

The sensory evaluation results of three treatments of Bitter gourd- Pineapple cookies were analyzed using an adjectival description (AD) scale.In terms of appearance, Treatment A (25g Bitter Gourd and 75g Pineapple) was described as "extremely appealing," with a mean score of 8.40, while, Treatment B (50g bitter gourd and 50g pineapple) and Treatment C (75g bitter gourd and 25g pineapple) received a rating of "very much appealing," with a mean score of 8.00 and 7.90 respectively. These findings reflects the highly appealing appearance of baked cookies in three treatments.

In terms of aroma, Treatment A was described as "extremely pleasant," with a mean score of 8.40. However, Treatment B and C got "very much pleasant" rating with the same mean score of 8.10. This means that bitter gourd and pineapple cookies registered pleasant aroma.

In terms of taste, Treatment A was perceived as "extremely delicious," with a mean score of 8.50. Treatment B got a "very much delicoius" rating with a mean of 8.10 and Treatment B was rated as "moderately delicious," with mean score of 7.00. These results indicate that the three treatments have varying tastes according to the evaluators.

In terms of texture, treatment A was rated "extremely chewy and soft" while both Treatment B and C were perceived as "very much chewy and soft" with mean scores of 7.90 and 7.80 respectively.

Overall, Treatment A consistently ranked highest across all quality attributes, followed by Treatment B, while Treatment C received the lowest ratings. These findings highlight the superior sensory qualities of Treatment C compared to the other treatments in terms of appearance, aroma, taste and texture.

The findings reflect different contributing factors in the sensory qualities of bitter gourd and pineapple cookies. One of which is maybe due to the proportion and measurement of ingredients. The amount of bitter gourd and pineapple used in every treatments were varied and so it gave also a different effect into the cookies. Varying the amounts of ingredients such as flour and water may affect the texture and appearance of the cookies.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.311 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 12, Issue 5, May 2025

DOI: 10.17148/IARJSET.2025.125333

Table 1. Sensory qualities of Bitter Gourd-Pineapple Cookies

Sensory Qualities	Treatment A		Treatment B		Treatment C	
	Mean	AD	Mean	AD	Mean	AD
Appearance	8.40	EA	8.00	VMA	7.90	VMA
Aroma	8.40	EP	8.10	VMP	8.10	VMP
Taste	8.50	ED	8.10	VMD	7.00	MD
Texture	8.30	ECS	7.90	VMCS	7.80	VMCS

Legend: ***Adjectival Description (AD)***

Score	*Appearance*	*Aroma*
8.12 – 9.00	*Extremely Appealing (EA)*	*Extremely Pleasant (EP)*
7.23 – 8.11	*Very Much Appealing (VMA)*	*Very Much Pleasant (VMP)*
6.34 – 7.22	*Moderately Appealing (MA)*	*Moderately Pleasant (MP)*
5.45 – 6.33	*Slightly Appealing (SA)*	*Slightly Pleasant (SP)*

Score	*Taste*	*Texture*
8.12 – 9.00	*Extremely Delicious (ED)*	*Extremely Flaky (ECS)*
7.23 – 8.11	*Very Much Delicious(VMD)*	*Very Much Flaky (VMF)*
6.34 – 7.22	*Moderately Delicious (MD)*	*Moderately Flaky (MF)*
5.45 – 6.33	*Slightly Delicious (SD)*	*Slightly Flaky (SCS)*

The study aimed to evaluate the acceptability of Bitter gourd-Pineapple Cookies among three formulations, focusing on appearance, aroma, taste, texture, and overall acceptability. Treatment A. was found to be the most acceptable, with the highest ratings across all sensory qualities. The result implies that in terms of acceptability in the appearance, aroma, taste and texture, bitter gourd and pineapple cookies differ significantly and there were variations among these qualities in three different treatments.

The significant differences among the different treatments of bitter gourd and Pineapple cookies could be attributed to the amount of bitter gourd and pineapple used. Bitter Gourd is known to have a bitter taste. An increase in the proportion of bitter gourd means increasing as well its bitter taste, however with the presence of pineapple the bitterness of bitter gourd can be concealed with its sweetness however, with little amount can also be less effective.

Future research should focus on extending the shelf life of Bitter gourd- Pineapple Cookies while preserving its sensory attributes and exploring different sweeteners and natural preservatives to improve product stability.

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.311 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 12, Issue 5, May 2025

DOI: 10.17148/IARJSET.2025.125333

Acceptability of Bitter gourd-Pineapple Cookies among the three (3) treatments in terms of appearance, aroma, taste, texture, and overall acceptability.

Sensory Qualities	Treatment A		Treatment B		Treatment	
	Mean	**AD**	**Mean**	**AD**	**Mean**	**AD**
Appearance	8.51	LE	8.32	LE	8.03	LVM
Aroma	8.47	LE	8.15	LE	8.19	LE
Taste	8.57	LE	8.11	LE	7.42	LVM
Texture	8.50	LE	8.30	LE	8.12	LVM
Overall Acceptability	**8.51**	LE	**8.22**	LE	**7.94**	LVM

Legend: ***Adjectival Description (AD)***

Score	***Appearance***
8.12 – 9.00	*Liked Extremely (LE)*
7.23 – 8.11	*Liked Very Much (LVM)*
6.34 – 7.22	*Liked Moderately (LM)*
5.45 – 6.33	*Liked Slightly (LS)*

IV. CONCLUSION

Based on the findings and objectives of the study, the following conclusions were formulated Bitter gourd and pineapple cookies were perceived as favorable in terms of its sensory qualities. All treatments were perceived to have best qualities in terms of appearance, aroma, taste and texture. The bitter gourd and pineapple cookie is favored in terms of the qualities evaluated by the panelists and consumers and therefore can be utilized as an ingredient in making cookies. This means also that bitter gourd and pineapple are potentially marketable and can be utilized in cookies production.

Statistical analysis revealed no significant difference in the sensory qualities of bitter gourd and pineapple cookies among the three treatments in terms of appearance, aroma, and texture while, in terms of taste, it revealed a significant difference. Therefore, all treatments show similar sensory qualities however, taste vary in each treatment individual preferences may vary based on personal taste preferences. All treatments A and B were liked extremely while treatment C was very much liked.

Overall, on the other hand, there was a significant difference in the general acceptability of bitter gourd and pineapple cookies among the three treatments. This indicates that all treatments have varying acceptability and they differ from one another. Different individual preference and the perception of evaluators showed different acceptability of the developed product.

V. RECOMMENDATION

Based on the conclusions drawn from the sensory evaluation, general acceptability assessment, and shelf-life determination of bitter gourd and pineapple cookies, the recommendations were constructed as follows:
It is recommended that since all treatments have favorable sensory qualities, the bitter gourd and pineapple can be utilized in baking cookies. Bitter gourd and pineapple cookies can be an innovative way to make snack food especially baked

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 8.311 ⁜ Peer-reviewed & Refereed journal ⁜ Vol. 12, Issue 5, May 2025

DOI: 10.17148/IARJSET.2025.125333

products as nutritionally significant for consumers of all ages. The development of bitter gourd and pineapple cookies can be a starting point for bakery owners and pastry chefs in developing more products that are made from bitter gourd and pineapple and other locally produced vegetables and crops.

REFERENCES

[1] Adebo, G. (2020). Impact of Fermentation on the Phenolic Compounds and Antioxidant Activity of Whole Cereal Grains: A Mini Review. International Journal of Food Science & Technology, 55(1), 45-56.
[2] Bourne, M. C. (2020). Food texture and viscosity: Concept and measurement. Elsevier.
[3] Bala, D., & Tiwari, A. (2018). Antioxidant and Antimicrobial Activity of Bitter Gourd (Momordica charantia) Extract. Journal of Food Science, 71(6), 472-476.
[4] Dahl, W. J. (2020). Food texture properties and evaluation methods.
[5]https://recipes.timesofindia.com/articles/features/whats-the-difference-between-taste-aroma-and-flavour/photostory/62440102.cms)
[6] Incorporating Fruits and Vegetables. Journal of Food Processing & Technology, 8(2), 317-324.
[7] Jain, S., & Mishra, R. (2015). Pineapple: A Valuable Source of Bioactive Compounds and Their Health Benefits. Food Research International, 74(5), 72-77.

