

BREADNUT (*Artocarpus camansi*) SEEDS BUTTER SPREAD

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Abstract

This experimental study was conducted to find the acceptability of Breadnut seeds (*Artocarpus camansi*) butter spread employing Nine Point Hedonic Scale and Five Point Likert Scale to gather the data and to determine the perception of evaluators as to aroma, color, taste, texture and general acceptability. The evaluators of the study were composed of twenty-five (25) Peanut butter consumers and twenty –five (25) Local entrepreneurs of Miagao. ANOVA was used to determine whether there are significant differences in four formulations while the mean number of evaluators and its percentage were used for the descriptive analysis result of the data. The findings revealed that Formulation A; no breadnut aroma, light brown in color, no breadnut taste, oily, and liked extremely. Formulation B; slightly breadnut aroma, medium brown in color, moderately breadnut butter taste, slightly oily, and liked very much. Formulation C; moderately breadnut aroma, medium brown in color, moderately butter taste, slightly oily, and liked extremely. Formulation D; very stimulating breadnut aroma, dark brown in color, very much breadnut butter taste, oily, and liked slightly. As to the general acceptability Formulation C with (50%) 125 grams Breadnut and (50%) 250 grams Peanut rated as liked extremely. The total cost of the most acceptable butter spread formulation which is Formulation C was Php36.73 and the ingredients utilized in this study is from Brgy. Tordesillas (Lupit), Sibalom Antique where there was an abundant source of breadnut seeds.

Keywords: Appearance, Breadnut seeds, Butter spread, Taste, Texture

INTRODUCTION

The breadnut tree (*Artocarpus Camansi*) is a tropical species native to the Pacific Islands, known for its nutritious seeds that are rich in protein, fiber, and healthy fats. While the seeds have been traditionally consumed in various forms, their potential as a sustainable and nutritious ingredient for modern food products remains largely untapped. One such opportunity lies in the development of a breadnut seed butter spread, which could offer a unique and healthier alternative to traditional nut butters. This research aims to explore the feasibility of producing a breadnut seed butter spread, investigating its physicochemical properties, nutritional profile, and sensory characteristics. By doing so, this study seeks to contribute to the valorization of breadnut seeds and promote their use as a valuable resource for the food industry. The result could also be of help to re-introduce breadnut and be of basis for future needs both in research and in general.

This study aims to evaluate the acceptability of Breadnut Seeds Butter Spread by examining the sensory characteristics—such as aroma, color, taste, and texture—of four formulations: Formulation A (100% Peanut as the control), Formulation B (75% Breadnut; 25% Peanut), Formulation C (50% Breadnut; 50% Peanut), and Formulation D (100% Breadnut). It also seeks to determine the general acceptability of the butter spread in these formulations, assess if there is a significant difference in the overall acceptability among the four formulations, and conduct a cost analysis of the most acceptable formulation.

LITERATURE REVIEW

The Theory of Innovation provides a foundational framework for the present study by emphasizing the importance of developing new products that meet consumer demands and promote sustainability. This theory guides the researchers in creating the Breadnut Seeds Butter Spread, which aims to be nutritious, affordable, and appealing.

Previous research on breadnut products offers valuable insights into sensory attributes and consumer preferences. Studies by Tipan, Colago, and Go highlight which qualities (such as taste and texture) are most appealing, informing the formulation of the new product. These findings suggest a market potential for innovative breadnut applications, encouraging the current study to explore further product development.

Additionally, the evaluative methods used in prior research can be adapted to assess the acceptability of the butter spread, ensuring that consumer feedback shapes the product. Overall, the integration of these theories and research findings supports the study's goal of creating a unique, health-oriented food product that leverages the benefits of locally sourced breadnut.

RESEARCH METHOD

Research Design

Experimental research was employed in this study. According to Babbie (2017), experimental research includes a hypothesis, a variable that can be manipulated by the researcher and variables that can be measured, calculated and compared. Most importantly, experimental research is completed in a controlled environment. The researcher collects data and hypothesis testing or a deductive research method. In this study, experimental research was used because it prepared one formulation as variable of the study which determined the acceptability of the product.

Respondents of the study

The evaluators of this study and were composed of 25 Peanut Butter Consumers and 25 Local Entrepreneurs in the Municipality of Miagao as well and, were purposively selected to evaluate the finished product. The evaluators were intentionally selected based on the criteria set by the researchers. The sample selection of the purposively selected evaluators includes; Age (if they are 18 years old and above); Health conditions (if they have allergy with nuts or asthma), and eating habits (if they eat or consumes peanut butter twice or thrice a week).

Materials and Instrumentation

The evaluators will be given the sensory evaluation sheet to determine their perception on Breadnut Seeds Butter Spread as to the level of general acceptability using the Nine-Point Hedonic Scale and the Five-Point Likert Scale in rating the aroma, color, taste and texture.

Data Gathering Procedure

This experimental study is divided into three phases: Phase I - Preparation of the Breadnut seeds along with the preparation of tools, utensils, and equipments, Phase II – Butter Processing in Four Formulations, Sensory evaluation, and the cost of the product was determined and Phase III – Perception of evaluators of the Breadnut Seeds Butter Spread as to aroma, color, taste, texture and general acceptability. The cost of the most acceptable formulation of breadnut seeds butter spread by the group of evaluators were computed.

Data Processing Techniques

The data were tabulated using SPSS. In addition, to check for the reliability and validity of the test results, the data was further analyzed and interpreted by using varying statistical analysis methods. The mean number of the evaluators and its percentage in terms of aroma, color, taste, texture, and general acceptability were used for the descriptive analysis of the data.

Lastly, ANOVA was used to determine whether there are significant differences and variances in four formulations in terms of aroma, color, taste, texture, and general acceptability. Analysis of Variance (ANOVA), a test that compares more than two groups, enables researchers to determine if there is a significant difference or none at all.

RESULTS AND DISCUSSION

Table 1. Sensory evaluation of Breadnut Seeds Butter Spread in different formulations in terms of Aroma

	f	%	Description
Formulation A	50	100	No Breadnut Aroma
Formulation B	29	58	Slightly Breadnut Aroma
Formulation C	37	74	Moderately Breadnut Aroma
Formulation D	27	54	Very Stimulating Breadnut Aroma

In terms of aroma, Formulation A shows that the mean number of evaluators (f=50; 100%), which corresponds to no breadnut aroma in the Five Point Likert Scale. This only shows that the amount of breadnut affects the aroma of the butter spread. This implies that the manufacturers should consider a more suitable and desirable formulation to maintain the aroma of Breadnut seeds in butter, to satisfy the aromatic preference of the peanut butter consumers.

Table 2. Sensory evaluation of Breadnut Seeds Butter Spread in different formulations in terms of Color

	f	%	Description
Formulation A	44	88	Light Brown
Formulation B	38	76	Medium Brown
Formulation C	30	60	Medium Brown
Formulation D	24	48	Dark Brown

In terms of color, Formulation A shows that the mean number of evaluators (f=44; 88%), which corresponds to light brown on the color scheme in the Five Point Likert Scale. This implies that the manufacturers should consider the color preference to satisfy the color of the peanut butter consumers since it is one of the factor that attracts them.

Table 3. Sensory evaluation of Breadnut Seeds Butter in different formulations in terms of Taste

	f	%	Description
Formulation A	45	90	No Breadnut Butter Spread Taste
Formulation B	26	52	Moderately Breadnut Butter Spread Taste
Formulation C	31	62	Moderately Breadnut Butter Spread Taste
Formulation D	27	54	Very Much Breadnut Butter Spread Taste

In terms of taste, Formulation A shows that the mean number of evaluators (f=45; 90%), which corresponds to no breadnut butter spread taste in the Five Point Likert Scale. This implies that the manufacturers should consider a more suitable and desirable formulation to maintain the taste of Breadnut seeds in butter spread, to satisfy the taste preference of the peanut butter consumers.

Table 4. Sensory evaluation of Breadnut Seeds Butter Spread in different formulations in terms of Texture

	f	%	Description
Formulation A	17	34	Moderately Oily
Formulation B	44	88	Slightly Oily
Formulation C	31	62	Slightly Oily
Formulation D	33	66	Oily

In terms of Texture, Formulation B shows that the mean of evaluators (f=44; 88%), which corresponds to slightly oily in the Five Point Likert Scale. This implies that the manufacturers should consider a more suitable and desirable formulation to maintain the oiliness of Breadnut seeds in butter spread, to satisfy the texture and mouthfeel preference of the peanut butter consumers.

Table 5. Level of Acceptability of Breadnut Seeds Butter Spread in terms of General Acceptability

Formulation	N	Mean	(SD)	Description
Formulation A	50	8.02	0.65	Liked Extremely
Formulation B	50	7.02	0.98	Liked Very Much
Formulation C	50	8.10	1.02	Liked Extremely
Formulation D	50	7.05	1.70	Liked Slightly

The result showed that breadnut seed butter spread in Formulation C (250 grams) (M=8.10, SD=1.02) which corresponds to liked extremely. This means that Formulation C with 125 grams (50%) of breadnut seeds and 250grams (50%) of peanuts is comparable to the butter spread with 500grams (100%) peanut as the control in terms of general acceptability. This is the composite rating of the evaluators in terms of aroma, color, taste, and texture.

Table 6. F-test result of general acceptability of Breadnut (*Artocarpus camansi*) seeds butter spread in four formulations

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	304.215	3	104.405	72.969	.000
Within Groups	272.380	196	1.390		
Total	576.595	196			

As shown on the table 6, the result revealed that there was a significant difference in evaluation of the evaluators in four formulations of Breadnut (*Artocarpus camansi*) seeds butter spread in terms of general acceptability. The computed F value of 72.969 was high and the significant value of .000

is lower than the significant value set at 0.01 level of significant difference. Thus, the null hypothesis which stated that there is no significant difference in the sensory characteristics of the evaluators in the general acceptability of Breadnut seeds butter spread was rejected and is not true.

Table 7. Cost Analysis of the most acceptable butter spread formulation

Formulation A	AP	EP	As Purchased Price	Cost per Unit as purchased	Extension Cost
1 cup peanut	250 grams	250 grams	Php80/1000grams	0.08	Php20
1 cup Breadnut seeds	128 grams	128 grams	Php50/1000grams	0.05	Php6.4
1 cup sugar	166 grams	166 grams	Php86/1000grams	0.09	Php14.94
6 tbsps. oil	72 grams	72 grams	Php80/1000grams	0.08	Php5.76
6 tbsps. Butter	85 grams	85 grams	Php65/1000grams	0.29	Php24.65
1/4 tsp. salt	1.46 grams	1.46 grams	Php28/140grams	0.2	Php0.29
jar	3 pcs.	3 pcs.	Php12/pc	12	Php36

Recipe Cost Php108.04 + 2%
 Total Recipe Cost Php110.20
 No. Of Portion (jars) = 3
 Cost per Portion (jars) = Php36.73

The purpose of the cost analysis of the most acceptable formulation is to determine the overall cost and overall expenses of the ingredients used and specifically the cost per portion (per jar) of the most preferred formulation. The table shows that Formulation A is the most acceptable and preferred butter formulation and it costs Php36.73 per jar.

CONCLUSION

Based on the result of the study, this butter spread is healthy and nutritious at the same new flavor to offer for the regular peanut butter consumers. The amount of Breadnut seeds added in different formulations contributes and affects to the acceptability of the product in terms of aroma, color, taste and texture.

Formulation C of Breadnut seeds is Liked Extremely having 250 grams of peanut and 125 grams of breadnut seeds. This showed that butter spread with proportioned amount of peanut and breadnut seeds made the butter spread acceptable and similarly with the control which is the pure peanut butter.

Breadnut can be a potential and a delicious flavor enhancer ingredient in making butter spread balancing the nutty flavor of peanut, especially for children and for those who are health-conscious but willing to try new innovated foods.

The breadnut seeds butter spread was costs cheaper and can produce more yield than butter spread without breadnut.

ACKNOWLEDGEMENT

The researchers would like to express their heartfelt gratitude to the individuals who have provided invaluable support, guidance, motivation, and encouragement throughout this academic journey. First and foremost, they thank the Almighty God, the ultimate source of wisdom, for His constant presence and guidance. Special thanks go to Dr. Ramon N. Emmanuel Jr., Campus Administrator, for granting permission to conduct the study; Prof. Rolly John F. Pelobello, Technological Research Instructor and chair of the panel, for his insightful guidance and unwavering support; Mrs. Jenny N. Sedano, statistician, for sharing her expertise in data interpretation; Prof. Marnie A. Nualan, research adviser, for her steadfast support and encouragement; Prof. Joann G. Muyong, research grammarian, for her valuable feedback; Dr. Solimar F. Moradas and Mrs. Ginafe F. Valderrama, for their consistent support and suggestions; and the evaluators, for their time, effort, and expertise in assessing the research. The researchers also extend their gratitude to their parents and family members for their prayers, financial support, and constant motivation, as well as to their friends, classmates, and everyone who provided encouragement and shared ideas. This journey has been one of the most challenging experiences of their college life, and it would not have been possible without the contributions of all those mentioned. To God be the Glory!

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