

SENSORY EVALUATION OF MALUNGGAY (MORINGA OLEIFERA) POLVORON WITH SESAME SEEDS

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Abstract:

The Malunggay (*Moringa Oleifera*) plant is a very nutritious vegetable which can help prevent sickness because of its many health benefits. It can help fight hunger, poverty and chronic malnutrition suffered by millions. With this reason the researchers looked for a better way to provide other ways to enjoy eating the said vegetable while, at the same time combatting malnutrition. Moreover, by making Malunggay Polvoron with Sesame Seeds, the livelihood opportunities of community members will hopefully be on the rise. This study used the experimental design method and involved sixty (60) respondents which were composed of 4 researchers, 20 Faculty members and 30 selected students from the different colleges of the university, namely, College of Business Management and Accountancy, College of Education, College of Engineering and Technology and College of Arts and Sciences. Scorecards were used with specific parameters to determine the level of acceptability of the product. Weighted arithmetic mean was utilized as statistical tools. The result of the study revealed that the quality of the product was interpreted as extremely acceptable for pilot and benchmark tests, largely acceptable for final test and was interpreted as extremely acceptable for the overall mean. Two recommendations were given as based on the findings of the study, (1) improvement of the packaging and labeling of the product for commercialization purposes, and (2) consider the product as livelihood for communities.

Keywords —*Malunggay, Polvoron, Sensory Evaluation, Product Development, Innovation*

I. INTRODUCTION

Background of the Study

Everyone loves sweets and delicacies. Travellers love to taste the delicacies that are being made by the place they visit and they even buy more to give as a gift to their families and friends. Filipinos are known for having values like being thoughtful, caring and loving. Filipinos, whether they are in their homeland or not have a deep, passionate and consistent love for delicacies and anything that has to do with it. Since they are naturally hospitable, gregarious food is the core of the social activities and lives of Filipinos. Not only

are the Filipinos known for their cooking, they are also known for their love of sweets. Eastern Samar is known all over the country for its dainty of delicacies that is being offered to the travellers. Specifically, Guiuan is making variety of delicacies and one of these delicacies is “Polvoron”. But as we all know most delicacies are delicious and sweet but lacks vitamin content, so this becomes the problem for the people who are health conscious.

Polvoron is a sweet concoction of toasted flour, powdered milk, sugar and butter. According to fatsecrets.com a serving of two pieces of original polvoron contains about 120 calories. Polvoron is a popular dessert, snack and even pasalubong back

home. It is sold both in sari-sari stores and high-end bakeries, that's how popular polvoron is in the Philippines

The main purpose of this study is to create awareness about the multitude of opportunities that sweet food can provide in rural and urban areas. Moreover, sweet foods have positive effects on other members of the supply chain as well as poor consumers in rural and urban communities. It is hoped that policy makers and development personnel recognize such opportunities and provide supporting and enabling environment for such a livelihood strategy to be pursued. This study also aims to give livelihood opportunities to unemployed members of the community.

Objectives of the Study

The study intended to conduct a sensory evaluation on the malunggay (Moringa Oleifera) polvoron with sesame seeds.

Specifically, determined the following objectives:

1. Develop of Malunggay (Moringa Oleifera) Polvoron with sesame seeds..
2. Evaluate the acceptability of Malunggay (Moringa Oleifera) Polvoron with sesame seeds, using the following parameters:
 - a. Taste
 - b. Color
 - c. Aroma
 - d. Texture
3. Determine the general acceptability of malunggay (moringa oleifera) polvoron with sesame seeds.

Scope and Delimitation of Study

This study have focused on determining the acceptability of Malunggay (Moringa Oleifera) Polvoron with Sesame Seeds. The study will adopt a score card by the Food and Agriculture Organization of the United Nations (2003) in determining the criteria for evaluating the Malunggay (Moringa Oleifera) Polvoron with sesame seeds. . This has been limited only on the parameters of Taste, Color, Texture, Aroma and

General Acceptability of the content of the Malunggay (Moringa Oleifera) Polvoron with sesame seeds.

Definition of Terms

The following terms are defined to help readers acquire better understanding of terms used in the study.

Appearance. This refers to the outward aspect (Mirriam-Webster Inc., 2013).In this study, it refers to the outside and inside characteristics of the Malunggay (Moringa Oleifera) Polvoron with sesame seeds.

Aroma. This refers to a distinctive pervasive and usually pleasant or savory smell (Mirriam-Webster Inc., 2014). In this study it refers to the pleasant, rich, sweet and natural (Yogambal, 2009) smell of a Malunggay (Moringa Oleifera) Polvoron With Sesame Seeds

Taste. This refers to the sensation of flavour perceived in the mouth and throat on contact with a substance (Oxford Dictionaries, 2014). In this study it refers to the pleasant, sweet and satisfying taste of the Malunggay (Moringa Oleifera) Polvoron With Sesame Seeds

Texture.Is the feel, appearance, or consistency of a surface or a substance.(Google)

In this study, it refers to the smooth and fine property of the Malunggay (Moringa Oleifera) Polvoron With Sesame Seeds.

Acceptability. It is the capability or worthy of being accepted, pleasing to the receiver, satisfactory, agreeable, and welcome (Dictionary.com as cited by Manzano, et al., 2015). In this study it refers to the acceptance of the product by the respondents using the score card in relation to color, texture, aroma and general acceptability.

Significance of the Study

To unemployed community members. For them to be aware of the livelihood opportunities to be given by making the product. And for them to

successfully develop this product so that it can help them get out from poverty.

To the BSHRM, BSED –TLE, BTVTEd, BSIT Student. Results of this study will give ideas to students to venture into a new products recipe using Malunggay that could add up to gain extra income.

To Instructors teaching cooking subjects. This will guide to the teacher in facilitating their learning information about this product. And also to give them additional delicacy to teach their students.

To the Consumers. This will help the consumers to find affordable yet nutritional product which could be consumed by people of all ages.

To the Future Researchers. This will be a great help to use as references for related studies or for product innovation. This will serve as their guidelines and source of information.

II. RELATED LITERATURE AND STUDIES

Related Literature

Moringa Oleifera leaves, seeds, bark, roots, sap, and flowers are widely used in traditional medicine, and the leaves and immature seed pods are used as food product in human nutrition. Leaf extracts exhibit the greatest antioxidant activity, and various safety studies in animals involving aqueous leaf extracts indicate a high degree of safety. No adverse effects were reported in association with human studies. Five human studies using powdered whole leaf preparation of Moringa Oleifera have been published, which have demonstrated anti-hyperglycemic (antidiabetic) and anti-dyslipidemic activities. (Stohs, 2015)

Moringa Oleifera has gained increasing popularity as a food supplement but not in the pharmaceutical and cosmetic area. The aim of this study was the preparation, characterization, and evaluation of extracts from the leaves of Moringa Oleifera as a herbal sun care phytocomplex. Furthermore, a formulation study researchers as a plant with numerous health benefits including nutritional and medicinal advantages. Moringa Oleifera contains essential amino acids,

carotenoids in leaves, and components with nutraceutical properties, supporting the idea of using this plant as a nutritional supplement or constituent in food preparation. Some nutritional evaluation has been carried out in leaves and stem. An important factor that accounts for the medicinal uses of Moringa Oleifera is its very wide range of vital antioxidants, antibiotics, and nutrients including vitamins and minerals. Almost all parts from Moringa can be used as a source for nutrition with other useful values. This mini-review elaborate od details on details its health benefits. (Baldisserotto 2018)

Phytomedicines are believed to have benefits over conventional drugs and are regaining interest in current research. Moringa Oleifera is a multi-purpose herbal plant used as human food and an alternative for medicinal purposes worldwide. It has been identified by researchers as a plant with numerous health benefits including nutritional and medicinal advantages. Moringa Oleifera contains essential amino acids, carotenoids in leaves, and components with nutraceutical properties, supporting the idea of using this plant as a nutritional supplement or constituent in food preparation. (Abdull 2014)

Sesame (*Sesamum indicum* L.) belonging to the order tubiflorae, family Pedaliaceae, is a herbaceous annual plant cultivated for its edible seed, oil and flavorsome value. It is also known as gingelly, til, benne seed and popularly as “Queen of Oilseeds” due to its high degree of resistance to oxidation and rancidity. Sesame seed contains 50-60% of high quality oil which is rich in polyunsaturated fatty acids (PUFA) and natural antioxidants, sesamin, sesamol and tocopherol homologues. These bioactive components enhance the stability and keeping quality of sesame oil along with numerous health benefits. Sesame seeds are considered as valuable foods as they enhance the diet with the pleasing aroma and flavor and offer nutritional and physiological benefits. Recent studies on the antioxidant and anti-carcinogenic activities of sesame seed have greatly increased its

applications in health food products that assert for liver and heart protection and tumor prevention. Sesame seed is high in protein, vitamin B1, dietary fiber as well as an excellent source of phosphorous, iron, magnesium calcium, manganese, copper and zinc. In addition to these important nutrients, sesame seeds contain two unique substances, sesamin and sesamol. Both of these substances belong to a group of special beneficial fibers called lignans and have a cholesterol lowering effect in humans and prevent high blood pressure and increase vitamin E supplies in animals.

Sesame seed is a common ingredient in various cuisines. It is used whole in cooking for its rich, nutty flavour. Sesame seeds are sometimes added to breads, including [bagels](#) and the tops of [hamburger](#) buns. Sesame seeds may be baked into [crackers](#), often in the form of [sticks](#). In Sicily and France, the seeds are eaten on bread (*ficelle sésame*, sesame thread). In Greece, the seeds are also used in cakes.

Since ancient times, sesame seeds are in use for traditional purposes. Sesame seeds are used in Hindu culture as a “symbol of immortality” and its oil is used widely in prayers and rituals performed during death of an individual. “Butter of the Middle East,” tahini, a smooth, creamy paste made up of toasted ground hulled sesame seeds is a traditional ingredient in Middle Eastern cooking. A portion of the nutritious seed cake is used as animal feed while the remainder is ground into sesame flour and added to health foods. Southern Indian cuisine depends upon sesame oil for cooking while in China, it was the only cooking oil until quite recently. Sesame seed benefits the body as a whole, especially the liver, kidney, spleen and stomach. Its high oil content not only lubricates the intestines, but nourishes all the internal viscera. It is also known to blacken the hair, especially the black sesame. Hence, it is applied to white hair, habitual constipation and insufficient lactation. Sesame oil is also helpful in treating intestinal worms such as ascaris, tapeworm, etc.

Polvorones are crumbly cookies found across Latin America, Spain and The Philippines. Some of you may know *polvorones* as Mexican wedding cookies. Those that are not familiar with the cookies think of them as a relative of shortbread cookies. Typically *polvorones* are made using flour, a fat like butter or even lard, sugar, sometimes milk, and ground nuts. Depending on the country they can be made using ground pecans, walnuts or even cashew nuts. Sometimes the *polvorones* are also coated in powdered sugar. Like many foods depending on the region and family the cookies can take on a different look. The commonality between them is that they are buttery, sweet and melt in your mouth.

Related Studies

A polvoron (From polvo, the Spanish word for pulverization, or dust; Cebuano: polboron; Tagalog: pulburon) is a type of heavy, soft and really crumbly Spanish shortbread made of flour, sugar, milk, and nuts. They are produced largely in Andalusia, where there are about 70 mills in that are portion of a mob that produces polvorones and mantecados. Under the name mantecados, these Sweets are a traditional readying of other countries of the Iberian Peninsula every bit good. As this was introduced by the Arabs, during the [Spanish Inquisition](#). It was subsequently decreed by the functionaries of the Inquisition that polvorones were to be made utilizing porc fat as agency of observing secret Jews and Muslims within the Southern Spanish parts. The Filipino version of polvoron uses a big sum of powdered milk which is left dry. every bit good as toasted flour. and butter or margarine alternatively of lard. A figure of local discrepancies on the traditional polvoron formula have been made. Well-known discrepancies include polvoron with casuy (cashew nut) . polvoron with pinipig (pounded and toasted immature green rice. similar to wrinkle rice) and polvoron with malunggay foliage. Strawberry. cocoa coated. violet yam (“ube”) . peanut and cookies-and-cream flavoured polvoron besides exist.

There are even some families in the Southern Tagalog parts that serve “polvorons” in fetes and other particular occasions. During this clip, some games affecting “polvorons” are held, like the one where contestants are made to eat tons of “polvoron” and told to whistle. Whoever succeeds in whistling first wins the competition. Polvoron really has Spanish beginnings. Its root word “polvo” is Spanish for pulverization or dust. Possibly due to the powder-like texture of flour, the chief ingredient of this delightful dainty is why it is called “polvoron.” Research shows that “polvoron” is produced chiefly in Andalusia, an independent part in Spain and is situated South of the Iberian Peninsula near the Mediterranean seashore. Studies further show that there are around 70 mills in that country that produce “polvorones” and “mantecados.” (ThemeIsle 2017)

The main ingredient in polvoron making is flour. Flour is an ingredient used in many foods, flour is a fine powder made from cereals or other starchy food sources. It is most commonly made from wheat, but also maize, rye, barley, and rice, amongst many other grasses and non-grain. Flour is the key ingredient of bread, which is the staple food in many countries, and therefore the availability of adequate supplies of flour has often been a major economic and political issue. Flour can also be made from squash. Squash is a long and narrow with dark grained skin and it somewhat resembles a cucumber. Squash can be made into several products other than ordinary used. It can be made into flour. The squash flour is prepared by peeling and slicing two inches thick. They are dried until brittle and grind into fine grains. Squash flour contains vitamin A, an essential nutrient for the promotion and maintenance of good eyesight. (Anna Kerylle 2013)

A local researcher has developed a calcium-enriched “polvoron,” a Filipino powder-based delicacy, using powdered milkfish (bangus) bones to decrease waste materials from fish deboning and prevent diseases such as osteoporosis due to calcium deficiency.

The study entitled “Formulation and Acceptability of Calcium-Enriched Polvoron” was conducted by Dr. Aurora Afalla, extension facilitator of the Institute of Fisheries of the Don Mariano Marcos Memorial State University in La Union.

Workflow

The study of this product includes input, process and output model of system approach. In these aspects the input are the materials that will be used in the preparation of the product. In order to come up with the product it will follow the procedure such as preparing, developing and designing. The output was Malunggay(Moringa Oleifera) Polvoron with sesame seeds.

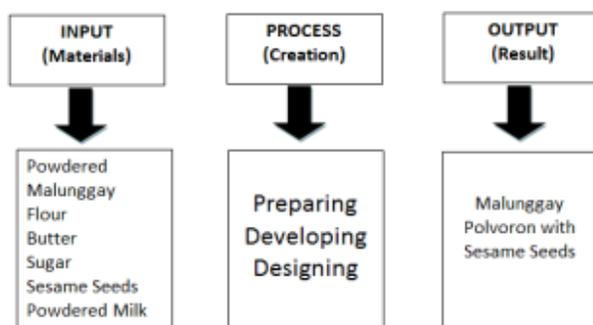


Figure 1. Workflow of the study

III. METHODOLOGY

Materials and Equipment

Stove. A portable or fixed apparatus that burns fuel or uses electricity to provide heat as cooking/ heating.

Wooden Spoon. A spoon is used for stirring and mixing ingredients in cooking. It is made of wood and has a long handle.

Mixing Bowl. Round bowls of varying sizes that are made of plastics, ceramic, glass, copper and stainless steel used for combining food ingredients when preparing recipes.

Frying Pan. A metal pan that has a long handle and is used for frying, searing and browning of foods.

Measuring Cup. Used to hold specific amount of both dry and liquid ingredients. It is available in a variety of sizes and materials.

Mortar and Pestle. A mortar is a vessel in which substances are ground or crushed with a pestle. A pestle is a tool used to crush, mash or grind materials in a mortar.

Polvoron Molder. A kitchen gadget used in making a Filipino treat called Polvoron. It comes in a different shape mostly round and oval shape. (Clark 2011)

Japanese Paper. Used to wrapped the malunggay polvoron with sesame seeds

Benchmark Test

The development of Malunggay Polvoron with Sesame seeds undergone (3) trials for each test: benchmark test was done by the researchers and randomly selected second year students from BSHRM.

Below was the list of ingredients, their corresponding quantity and development cost for benchmark test.

T1	T2	T3
¾ kls flour P30.00	¾ kls flour P30.00	¾ kls flour P30.00
320grams P107.00	320grams P107.00	320grams P107.00
powdered milk P36.00	powdered milk P36.00	powdered milk P36.00
500grams butter P10.00	500grams butter P10.00	500grams butter P10.00
3 tsp sesame seeds P15.00	3tspsesame seeds P15.00	3 tsp sesame seeds P15.00
250grams malunggay powder P26.75	250grams malunggay powder P26.75	250grams malunggay powder P26.75

sugar Total P224.75	sugar Total P224.75	sugar Total P224.75
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Pilot Test

The development of Malunggay Polvoron with Sesame seeds undergone (3) trials for each test: pilot test was done by 10 researchers.

Below was the list of ingredients, their corresponding quantity and development cost for pilot test.

T1	T2	T3
1 kl flour P45.00	1 kl flour P45.00	1 kl flour P45.00
500grams P480.00	500grams P480.00	480grams P480.00
ms P0.00	ms P0.00	ams P0.00
powdered milk P36.00	powdered milk P36.00	powdered milk P36.00
500grams butter P10.00	500grams butter P10.00	500grams butter P10.00
3 tsp sesame seeds P15.00	3tspsesame seeds P15.00	3 tsp sesame seeds P15.00
250grams malunggay powder P15.00	250grams malunggay powder P15.00	250grams malunggay powder P15.00
1 kl sugar Total P639.00	1 kl sugar Total P639.00	1 kl sugar Total P639.00

Final Test

The development of Malunggay Polvoron with Sesame seeds undergone (3) trials for each test: final test was done by the 20 faculties and administrative staff of the university.

Below was the list of ingredients, their corresponding quantity and development cost for Final test.

T1		T2		T3	
1 kl flour	P45.00	1 kl flour	P45.00	1 kl flour	P45.00
500grams powder ed milk	P480.00	500grams powdered milk	P480.00	480grams powdered milk	P480.00
500grams butter	P36.00	500grams butter	P36.00	500grams butter	P36.00
3 tsp sesame seeds	P10.00	3tsp sesame seeds	P10.00	3 tsp sesame seeds	P10.00
250grams malunggay powder	P15.00	250grams malunggay powder	P15.00	250grams malunggay powder	P15.00
1 kl sugar	P53.00	1 kl sugar	P53.00	1 kl sugar	P53.00
Total	P639.00	Total	P639.00	Total	P639.00

Research Design

This study used the experimental design method. The method is used to appraise carefully the worthiness of the current study. The gathering of data will be done through administration of score card to the respondents of the study. The score card will serve as key information on how the researcher improved more about the product offering to the target consumers.

Research Locale

This research had been conducted at ESSU - Guiuan Campus, located at Brgy. Salug Guiuan E. Samar.

Respondent of the Study

Thirty (30) selected fourth year students ten from College of Business Management and Accountancy, ten from College of Education and Ten (10) from College of Engineering and Technology for the pilot test, thirty(30) Faculties in ESSU-Guiuan Campus for the Benchmark test and Ten (10) polvoron makers and vendors for the final test to taste the product and to get their response about the taste, color, aroma and texture, overall their acceptability of our malunggay polvoron and large number of students, faculties and expertise that may become the possible customers.

Research Instrument

In the process of gathering information the researchers used the sensory evaluation to generated number of student the information about the acceptability of Malunggay (Moringa Oleifera) Polvoron in ESSU – Guiuan Campus. The rating where 1-5, 5 presents the highest rate and 1 as the lowest rate. These criteria will compose of five parameters that includes aroma, taste, texture and general acceptability.

Data Collection Procedure

The researchers prepared a communication letter addressed to the campus administrator of the research locale for conducting the study, after the request has been approved, the researcher distribute sensory evaluation to be fill up and rate by the respondents together with the product. The researcher used the purposive sampling in which the respondents are chosen based on the characteristics needed in the investigation. Then, the researchers will collect the sensory evaluation and tally the result for statistical analysis.

Measurement of Variables

To measure the variables, the researcher rated the variables by 1-5, where in 5 as the highest and 1 as the lowest. The researcher used the ordinal

measurement because in ordinal the attributes are rank in order.

Scale	Ranges	Interpretation
5	4.21-5.00	Extremely Acceptable
4	3.41-4.20	Highly Acceptable
3	2.41-3.40	Acceptable
2	1.81-2.40	Fairly Acceptable
1	1.00-1.80	Slightly Acceptable

Data Analysis

The collected data had been subjected to weighted arithmetic mean which is obtained by adding all the observations and dividing the sum by the number of observations with emphasis of different weights on the basis of their relative importance (Berri, 2010).

Ingredients:

- 1 kl. Flour
- 250 grams Butter
- 2 tbsp sesame seeds
- 500 grams white sugar
- 350 grams powdered milk
- 250 grams powdered malunggay



Procedure:

1. Measure the ingredients needed. Set aside 2 cups for the flour, 1 cup for the powdered milk and 1 cup for the sugar.
2. Heat the frying pan in low heat. Pour 2 cups of flour and toast it. Stir for about 15- 20 minutes.
3. When the flour develops an aroma and starts turning brown add cup of powdered milk and powdered Malunggay
4. Add 1 cup of sugar
5. Add 2 tablespoon of sesame seeds

6. On a separate stove, melt in low heat.
7. Turn the stove off and set aside the mixture
8. Once melted add the butter in the mixture. No need to turn on the stove when mixing.
9. Transfer the mixture in a different container.
10. Get the polvoron molder, scoop the mixture and place them on top of a cut cellophane paper. Wrap them properly.

IV. RESULTS AND DISCUSSION

Development of the Product

Indicated below are the step by step procedures to guide readers within the development of Malunggay Polvoron with sesame Seeds.

Procedure:

1. Measure the ingredients needed. Set aside 2 cups for the flour, 1 cup for the powdered milk and 1 cup for the sugar.
2. Heat the frying pan in low heat. Pour 2 cups of flour and toast it. Stir for about 15- 20 minutes.
3. When the flour develops an aroma and starts turning brown add cup of powdered milk and powdered Malunggay
4. Add 1 cup of sugar
5. Add 2 tablespoon of sesame seeds
6. On a separate stove, melt in low heat.
7. Turn the stove off and set aside the mixture
8. Once melted add the butter in the mixture. No need to turn on the stove when mixing.
9. Transfer the mixture in a different container.
10. Get the polvoron molder, scoop the mixture and place them on top of a cut cellophane paper. Wrap them properly.

Evaluating the Product

To determine the acceptability of Malunggay Polvoron. The researcher conducted 3 test. The pilot test, bench mark and the final test. A score card together with the product was given to test the

acceptability of the Malunggay Polvoron. The research handheld the scorecard to determine respondent’s perception and acceptability of the Malunggay polvoron.

Pilot Test

TABLE 2. Pilot Test in terms of Taste.

Items	Mean Score	Interpretation
Trial 1	4.40	Extremely
Trial 2	4.60	Acceptable
Trial 3	4.50	Extremely
		Acceptable
Total Mean Score	4.50	Extremely
		Acceptable

Table 2 shows the result of the evaluation during the benchmark test in terms of taste. There were thirty (30) selected fourth year students ten (10) from College of Business Management and Accountancy, ten (10) from College of Education and ten (10) from College of Engineering and Technology participated during the evaluation of the product. The researchers conducted three trials in benchmark test. Each indicator has the scale of 1 to 5. Trial 2 got the highest mean score of 4.60 and interpreted as “Extremely Acceptable” while trial 1 got the lowest mean score of 4.40 and interpreted as “Extremely Acceptable”. With an overall mean score of 4.50 and interpreted as “Extremely Acceptable”.

TABLE 3. Pilot Test in terms of Color.

Items	Mean Score	Interpretation
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Trial 1	4.77	Extremely
Trial 2	4.76	Acceptable
Trial 3	4.78	Extremely
		Acceptable
Total Mean Score	4.77	Extremely
		Acceptable

Table 3 shows the result of the evaluation during the pilot test in terms of color. There were Thirty selected fourth year students ten from College of Business Management and Accountancy, ten from College of Education and Ten from College of Engineering and Technology participated during the evaluation of the product. The researchers conducted three trials in pilot test. Each indicator has the scale of 1 to 5. Trial 3 got the highest mean score of 4.78 and interpreted as “Extremely Acceptable” while trial 2 got the lowest mean score of 4.76 and interpreted as “Extremely Acceptable”. With an overall mean score of 4.77 and interpreted as “Extremely Acceptable”.

TABLE 4. Pilot Test in terms of Texture.

Items	Mean Score	Interpretation
Trial 1	4.60	Extremely
Trial 2	4.50	Acceptable
Trial 3	4.56	Extremely
		Acceptable
Total Mean Score	4.55	Extremely
		Acceptable

Table 4 shows the result of the evaluation during the pilot test in terms of texture. There were Thirty selected fourth year students ten from College of Business Management and Accountancy, ten from College of Education and Ten from College of Engineering and Technology participated during the

evaluation of the product. The researchers conducted three trials in pilot test. Each indicator has the scale of 1 to 5. Trial 1 got the highest mean score of 4.60 and interpreted as “Extremely Acceptable” while trial 2 got the lowest mean score of 4.50 and interpreted as “Extremely Acceptable”. With an overall mean score of 4.55 and interpreted as “Extremely Acceptable”.

Texture	4.55	Extremely Acceptable
Aroma	4.0	Highly Acceptable
General Acceptability	4.44	Extremely Acceptable
Total Mean Score	4.46	Extremely Acceptable

TABLE 5. Pilot Test in terms of Aroma.

Items	Mean Score	Interpretation
Trial 1	3.70	Highly Acceptable
Trial 2	4.15	Highly Acceptable
Trial 3	4.20	Highly Acceptable
Total Mean Score	4.0	Highly Acceptable

Table 5 shows the result of the evaluation during the pilot test in terms of Aroma. There were Thirty selected fourth year students ten from College of Business Management and Accountancy, ten from College of Education and Ten from College of Engineering and Technology participated during the evaluation of the product. The researchers conducted three trials in pilot test. Each indicator has the scale of 1 to 5. Trial 3 got the highest mean score of 4.20 and interpreted as “Highly Acceptable” while trial 1 got the lowest mean score of .70 and interpreted as “Highly Acceptable”. With an overall mean score of 4.0 and interpreted as “Highly Acceptable”.

TABLE 6. Summary Table for the Pilot Test

Items	Mean Score	Interpretation
Taste	4.50	Extremely Acceptable
Color	4.77	Extremely Acceptable

Table 6 shows that there were Thirty selected fourth year students ten from College of Business Management and Accountancy, ten from College of Education and Ten from College of Engineering and Technology during the pilot test who answered the sensory evaluation of the product. Each variable has the scale of 1 to 5. Among the variables color, got the highest mean score of 4.77 which has interpreted as Extremely Acceptable, aroma has the lowest mean score of 4.0 interpreted as highly Acceptable. This means that the respondents are convinced with the color of the product.

Benchmark Test

TABLE 7. Benchmark Test in terms of Taste.

Items	Mean Score	Interpretation
Trial 1	3.96	Highly Acceptable
Trial 2	4.50	Extremely Acceptable
Trial 3	4.60	Extremely Acceptable
Total Mean Score	4.3	Extremely Acceptable

Table 7 shows the result of the evaluation during the benchmark test in terms of taste. There were thirty Faculties in ESSU-Guiuan Campus participated during the evaluation of the product. The researchers conducted three trials in benchmark test. Each indicator has the scale of 1 to 5. Trial 3 got the highest mean score of 4.60 and interpreted as “Extremely Acceptable” while trial 1 got the lowest mean score of 3.96 and interpreted as

“Highly Acceptable”. With an overall mean score of 4.3 and interpreted as “Extremely Acceptable”.

TABLE 8. Benchmark Test in terms of Color.

Items	Mean Score	Interpretation
Trial 1	4.0	Highly
Trial 2	4.5	Acceptable
Trial 3	4.3	Extremely Acceptable
Total Mean Score	4.3	Extremely Acceptable

Table 8 shows the result of the evaluation during the benchmark test in terms of taste. There were thirty Faculties in ESSU-Guiuan Campus participated during the evaluation of the product. The researchers conducted three trials in pilot test. Each indicator has the scale of 1 to 5. Trial 2 got the highest mean score of 4.5 and interpreted as “Extremely Acceptable” while trial 1 got the lowest mean score of 4.0 and interpreted as “Highly Acceptable”. With an overall mean score of 4.3 and interpreted as “Extremely Acceptable”.

TABLE 9. Benchmark Test in terms of Texture.

Items	Mean Score	Interpretation
Trial 1	4.3	Extremely
Trial 2	4.0	Acceptable
Trial 3	4.5	Highly Acceptable
Total Mean Score	4.3	Extremely Acceptable

Table 9 shows the result of the evaluation during the benchmark test in terms of texture. There were thirty Faculties in ESSU-Guiuan Campus participated during the evaluation of the product. The researchers conducted three trials in benchmark test. Each indicator has the scale of 1 to 5. Trial 3 got the highest mean score of 4.5 and interpreted as “Extremely Acceptable” while trial 2 got the lowest mean score of 4.0 and interpreted as “Highly Acceptable”. With an overall mean score of 4.3 and interpreted as “Extremely Acceptable”.

TABLE 10. Benchmark Test in terms of Aroma.

Items	Mean Score	Interpretation
Trial 1	3.8	Highly
Trial 2	4.3	Acceptable
Trial 3	4.0	Extremely Acceptable
Total Mean Score	4.0	Highly Acceptable

Table 10 shows the result of the evaluation during the benchmark test in terms of aroma. There were thirty Faculties in ESSU-Guiuan Campus participated during the evaluation of the product. The researchers conducted three trials in pilot test. Each indicator has the scale of 1 to 5. Trial 2 got the highest mean score of 4.3 and interpreted as “Extremely Acceptable” while trial 1 got the lowest mean score of 3.8 and interpreted as “Highly Acceptable”. With an overall mean score of 4.0 and interpreted as “Highly Acceptable”.

TABLE 11. Summary Table for the Benchmark Taste.

Items	Mean Score	Interpretation
Taste	4.3	Extremely
Color	4.3	Acceptable
		Extremely Acceptable

Texture	4.3	Extremely Acceptable	Trial 1	4.20	Highly Acceptable
Aroma	4.0	Highly Acceptable	Trial 2	4.1	Highly Acceptable
General Acceptability	4.3	Extremely Acceptable	Trial 3	4.47	Extremely Acceptable
Total Mean Score	4.24	Extremely Acceptable	Total Mean Score	4.25	Extremely Acceptable

Table 11 shows that there were thirty Faculties in ESSU-Guiuan Campus who answered the sensory evaluation of the product. Each variable has the scale of 1 to 5. Among the variables color, taste, texture and general acceptability got the highest mean score of 4.3 which has interpreted as Extremely Acceptable, aroma has the lowest mean score of 4.0 interpreted as highly Acceptable.

Final Test

TABLE 12. Final Test in terms of Taste.

Items	Mean Score	Interpretation
Trial 1	4.15	Highly Acceptable
Trial 2	4.93	Extremely Acceptable
Trial 3	4.89	Extremely Acceptable
Total Mean Score	4.65	Extremely Acceptable

Table 12 shows the result of the evaluation during the final test in terms of taste. There were Ten polvoron makers and vendors participated during the evaluation of the product. The researchers conducted three trials in final test. Each indicator has the scale of 1 to 5. Trial 2 got the highest mean score of 4.93 and interpreted as “Extremely Acceptable” while trial 1 got the lowest mean score of 4.15 and interpreted as “Highly Acceptable”. With an overall mean score of 4.65 and interpreted as “Extremely Acceptable”.

TABLE 13. Final Test in terms of Color.

Items	Mean Score	Interpretation
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Table 13 shows the result of the evaluation during the final test in terms of color. There were Ten polvoron makers and vendors participated during the evaluation of the product. The researchers conducted three trials in final test. Each indicator has the scale of 1 to 5. Trial 3 got the highest mean score of 4.47 and interpreted as “Extremely Acceptable” while trial 2 got the lowest mean score of 4.1 and interpreted as “Highly Acceptable”. With an overall mean score of 4.25 and interpreted as “Extremely Acceptable”.

TABLE 14. Final Test in terms of Texture.

Items	Mean Score	Interpretation
Trial 1	3.8	Highly Acceptable
Trial 2	4.3	Extremely Acceptable
Trial 3	4.0	Highly Acceptable
Total Mean Score	4.0	Highly Acceptable

Table 14 shows the result of the evaluation during the final test in terms of texture. There were Ten polvoron makers and vendors participated during the evaluation of the product. The researchers conducted three trials in final test. Each indicator has the scale of 1 to 5. Trial 2 got the highest mean score of 4.3 and interpreted as “Extremely Acceptable” while trial 1 got the lowest mean score of 3.8 and interpreted as “Highly Acceptable”. With an overall mean score of 4.0 and interpreted as “Highly Acceptable”.

TABLE 15. Final Test in terms of Aroma.

Items	Mean Score	Interpretation
Trial 1	4.1	Highly
Trial 2	4.20	Acceptable
Trial 3	4.47	Extremely Acceptable
Total Mean Score	4.25	Extremely Acceptable

Table 15 shows the result of the evaluation during the final test in terms of aroma. There were Ten polvoron makers and vendors participated during the evaluation of the product. The researchers conducted three trials in final test. Each indicator has the scale of 1 to 5. Trial 2 got the highest mean score of 4.20 and interpreted as “Extremely Acceptable” while trial 1 got the lowest mean score of 4.5 and interpreted as “Highly Acceptable”. With an overall mean score of 4.25 and interpreted as “Extremely Acceptable”.

TABLE 16. Summary table for the Final Test

Items	Mean Score	Interpretation
Taste	4.65	Extremely
Color	4.25	Acceptable
Texture	4.0	Extremely Acceptable
Aroma	4.25	Highly
General Acceptability	3.8	Acceptable
Total Mean Score	4.19	Highly Acceptable

Table 16 shows that there were Ten polvoron makers and vendors who answered the sensory evaluation of the product. Each variable has the scale of 1 to 5. Among the variables taste got the highest mean of 4.65 which was interpreted as extremely acceptable, while general acceptability has the lowest mean score of 3.8 interpreted as highly acceptable.

General Acceptability of the Malunggay Polvoron with Sesame Seeds

Table 17. The overall computed mean of all the respondents

Respondents	Total Mean Score	Interpretation
CBMA, COED, CET	4.46	Highly
Selected Faculties ESSU Guiuan Campus	4.24	Acceptable
Polvoron Makers and Vendors	4.19	Extremely Acceptable
Total Mean Score	4.29	Extremely Acceptable

Table 17 shows that based on the result of the sensory evaluation of the product that Polvoron Makers and Vendors and Selected Faculties of ESSU Guiuan Campus got the total mean score of 4.24 and 4.19 which was interpreted as Extremely Acceptable and Highly Acceptable while for the CBMA, COED, and CET gave the total mean score of 4.46 which was also interpreted as Extremely Acceptable. Therefore, for all the respondents the overall total mean score was 4.29 which means that they accept the Malunggay Polvoron with Sesame Seeds.

V. SUMMARY, CONCLUSION, AND RECOMMENDATION

Summary

This study sought to determine the acceptability of Malunggay Polvoron with Sesame seeds. Specifically, this sought to answer the following questions:

1. Develop of Malunggay (Moringa Oleifera) Polvoron with sesame seeds..
2. Evaluate the acceptability of Malunggay (Moringa Oleifera) Polvoron with sesame seeds, using the following parameters:
 - a. Taste
 - b. Color
 - c. Aroma
 - d. Texture

3. Determine the general acceptability of malunggay (*moringa oleifera*) polvoron with sesame seeds.

The development of Malunggay Polvoron with sesame Seeds was limited to the following characteristics and criteria as to taste, color, texture, aroma and general acceptability. This was also limited to raw materials of Malunggay as used in other related products.

The respondents of the study were thirty selected fourth year students ten from College of Business Management and Accountancy, ten (10) from College of Education and ten (10) from College of Engineering and Technology for the pilot test, thirty(30) Faculty member in ESSU-Guiuan Campus for the Benchmark test and ten (10) polvoron makers and vendors for the final test.

There was score cards served as an instrument of collecting data conducted to the respondents in order to gather reliable data information. To quantify the responses, mean was used in order to know the Malunggay Polvoron with sesame seeds in terms of color, aroma, texture and general acceptability of the finished product

Conclusion

Based on the result of the sensory evaluation, the researchers found out that Malunggay Polvoron with sesame seeds was highly acceptable having the desired taste,color, aroma, texture and general acceptability. Having an overall interpretation of acceptable therefore the Malunggay Polvoron with Sesame Seeds can be used as a source of livelihood since there were abundant supply of Malunggay in Guiuan Eastern Samar.

Recommendations

Based on the conclusion made, the following recommendations were drawn:

1. Improve the packaging and labeling of the product for commercialization;
2. Students and instructors are encouraged to make their product in order to have additional income;

3. Instructors are encouraged to have further production for business purposes; and
4. Further study is encouraged for nutritive value and shelf life of Malunggay Polvoron.

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