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Awareness, Attitude, and Willingness to Purchase Alternative Nut Butters Among Residents in Iligan City

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ABSTRACT

This study aimed to determine awareness, attitude, and willingness to purchase a variety of alternative nut butters among the consumers. Additionally, the research aims to gather data from the residents of Iligan City. Specifically, it seeks to evaluate the feasibility and market potential of alternative nut butters in terms of consumer awareness, consumers perception, product image, pricing, and willingness to buy. The quantitative research focused on alternative nut butter through a survey that suggests possible alternative nut butters from mango kernel, avocado, jackfruit, durian, rambutan, and mangosteen. The researchers utilized descriptive (frequency, percentage, mean, standard deviation) and inferential (ANOVA, correlation) statistical tools to analyze the data gathered from the survey. Based on the data gathered, avocado ranked 1st as the most preferred alternative nut butter with a percentage of 65.5%, the second most preferred nut butter alternative is the mango kernels butter 63%, and durian as the least preferred alternative nut butter among the six alternative nut butter with a percentage of 15.5%. Furthermore, looking for alternatives for nut butter help reduce the fruit kernel waste while also providing options for those individuals who have peanut allergies, looking for innovative, organic and healthy nut butter alternatives. The research also suggests that these nut butter alternatives may not only help the environment but can also contribute to the development of healthier food choices and create new opportunities for local food businesses and entrepreneurs in Iligan City.

INTRODUCTION

Peanut butter has maintained its status as one of the most frequently eaten food spreads worldwide because 69 percent of American consumers bought it during a three-month period (Kelsey, 2022, as cited in Reese, 2024). The spread serves as a basic food item which people from different cultures and age groups continue to use in their homes throughout Western nations and several Asian regions, including the Philippines.

People who live in developing countries use peanut butter as their primary source of plant-based protein because it offers both low-priced and easily obtainable nutrition. A study on peanut consumption patterns in South Africa found that peanut butter was available in 80.6 percent of households surveyed, demonstrating its widespread acceptance even among lower income groups (O'Halloran *et al.*, 2021, as cited in Muller *et al.*, 2026). People in lower income brackets choose food items based on their price and availability which includes peanuts as an essential plant-based protein source for their meals (Shisana *et al.*, 2013, as cited in Muller *et al.*, 2026). The pattern of Philippine peanut butter consumption shows strong similarities to the Philippine consumption practice because peanut butter serves as a basic item which people use in their homes. Peanut butter serves as a popular food choice yet it brings along multiple safety issues. Peanut allergies affect approximately 4 million Americans and this increasing allergy rate creates safety concerns about peanut products (Shah *et al.*, 2019).

The nut butter market is experiencing changes because

of rising health and safety concerns and increased global health awareness among consumers. According to a global market study by Kaczorowski (2022), different consumer groups worldwide now prefer food spreads that contain natural ingredients and high protein content while providing distinct health advantages. The market has now opened up for alternative nut butter products to achieve substantial market growth. The same study showed that almond butter had overtaken peanut butter in market share by 2022, which demonstrates how consumers now accept alternative products (Kaczorowski, 2022). The nut butter market in the United States will reach a value of \$4.1 billion by 2026 because consumers now want healthier nut butter products that come with more options (Kelsey, 2022, as cited in Reese 2024). Alternative food products see rising interest from consumers in both developed and developing countries. Research conducted in India found that consumer purchase intention toward healthier food alternatives is significantly influenced by environmental concern, attitude, and willingness to pay a premium, which indicates that health-conscious consumer behavior exists as a worldwide pattern that extends to developing nations (Pratap & Purohit, 2024). The Philippines, as an agricultural country rich in tropical fruits and crops, is well-positioned to be part of this global shift toward alternative food products. The global demand for alternative nut butters shows continuous growth yet researchers have not studied how Filipino consumers in Iligan City evaluate these nut butter alternatives. Researchers need to study local consumer

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awareness and their attitudes towards purchasing alternative nut butters to assess the market potential of these products in the Philippines. This study therefore seeks to assess the awareness, attitude, and willingness to purchase alternative nut butters among residents of Iligan City, contributing to the growing body of knowledge on consumer behavior toward innovative and health-conscious food products in the Philippines.

The purpose of this study is to determine the feasibility of alternative nut butters in terms of usage, attitude and image as well as the level of awareness and acceptance among residents of Iligan City. Specifically, this study seeks to answer the following questions:

1. What is the demographic profile of the respondents in terms of:
 - a. Age;
 - b. Sex;
 - c. Income?
2. Which alternative nut butter is preferred by the respondents?
 - a. Mango Kernel Butter;
 - b. Avocado Butter;
 - c. Jackfruit Butter;
 - d. Durian Butter;
 - e. Rambutan Butter;
 - f. Mangosteen Butter?
3. What is the perception of the respondents to purchase the other alternatives as a substitute for peanut butter?
4. What is the level of willingness of the respondents to purchase the alternative nut butters if it becomes commercially available?
5. What is the level of awareness of the respondents regarding alternative nut butters?
6. What are the preferred product specifications of the respondents in terms of:
 - a. Price;
 - b. Packaging type;
 - c. Net weight (grams)?
7. Is there a significant relationship between the demographic profile of the respondents and their acceptance of alternative nut butters.
8. Is there a significant relationship between the demographic profile of the respondents and their willingness to purchase the alternative nut butter?
9. Based on the findings, what recommendations can be proposed?

Theoretical and Conceptual Framework

The present study is mainly focused on the Awareness, Attitude, and Willingness to Purchase (AAP) model, which was developed based on the Theory of Planned Behavior (TPB) by Icek Ajzen in 1985. This model is widely used in consumer behavior studies. This model indicates that consumer behavior is developed in three ways. First, there is awareness, then attitude is developed, and last, there is willingness to purchase the product. The first part of the model is “awareness,” which indicates that consumers have knowledge about the availability of

nut butters in the market. This is an important part of the model, as consumers have to be first aware of the product in order to consider purchasing it. The second part of the model is “attitude,” which indicates that consumers have developed an attitude toward the product depending on its features, such as taste, texture, aroma, nutritional value, and quality. The more positive attitude consumers have toward the product, the more likely they are to purchase it. The “willingness to purchase” part of the model indicates that consumers have developed an intention to purchase the product, which is an indicator of its marketability.

In addition, this study is also backed by the Usage, Attitude, and Image (UAI) concept developed by Ned Roberto, which is widely utilized in marketing research to measure the perceptions of consumers and the level of success of the product. The UAI concept has three main components: usage, attitude, and image. With regard to the study, the attitude component is related to the AAP concept, which pertains to the evaluation and acceptance of the alternative nut butters by the consumers. On the other hand, the image component is related to the analysis of the perceptions of the consumers about the benefits, quality, and positioning of the product as an alternative to the conventional nut-based spreads. Although the usage component is not the main focus of the study, the concept itself offers another perspective on the potential adoption of the product by consumers.

The integration of the two concepts, namely the AAP and UAI frameworks, aims to gain more insights into the perceptions of consumers about the evaluation and purchase intentions of the alternative nut butters in Iligan City. Collectively, the two concepts provide the basis for measuring the acceptability and potential success of the product in the market. The conceptual framework of this research is anchored on the Input-Process-Output Model, which is further supported by the Usage, Attitude, and Image framework. The research takes into consideration the demographic profile of respondents in terms of their age, sex, and income level, as well as their level of awareness with regard to alternative nut butters. It also includes the attitude or perception of respondents with regard to the products as alternatives to peanut butter, their preference for either of the alternative nut butters, their level of willingness to buy the nut butters, and their preferred product specifications in terms of price, packaging type, and net weight. To obtain the required data, researchers make use of a UAI Study Questionnaire, as well as survey questionnaires, in order to gather the required data. By using this method, researchers are able to analyze the data with the help of descriptive and inferential statistics, which include hypothesis testing, in order to determine the relationship between these variables, which would help in determining the marketability and viability of nut butters, namely, mango butter, avocado butter, jackfruit butter, durian butter, rambutan butter, and mangosteen butter, in Iligan City, while promoting the sustainable use of agricultural by-products.

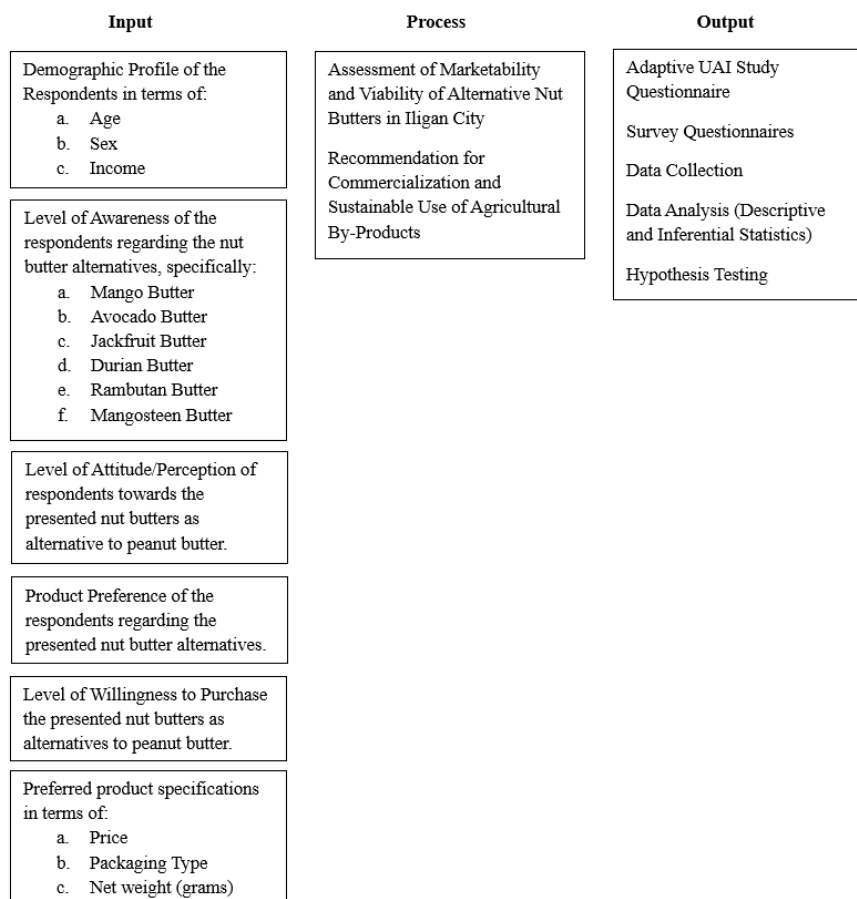


Figure 1: Conceptual Framework

LITERATURE RIREVIEW

The chapter provides an extensive examination of all research studies which investigate how consumers understand alternative nut butters and what their attitudes are toward these products and their intents to buy them. The theoretical framework of the study together with existing research about peanut butter consumption problems and the increasing worldwide demand for alternative nut butters and consumer patterns about nontraditional food products all appear in the review. The researchers need to examine existing literature because it creates the foundation for their research about how marketable and viable alternative nut butters, which include mango butter, avocado butter, jackfruit butter, durian butter, rambutan butter, and mangosteen butter, are in Iligan City. Researchers need to see existing research about these areas because it helps them understand which studies need to be done and why the study is important at this time. The study investigates three main concepts which include awareness that measures how much respondents know about alternative nut butters and attitude that shows how respondents view alternative nut butters as a replacement for peanut butter and willingness to purchase that shows how likely respondents would buy alternative nut butters when those products become available. The study investigates these constructs through two theoretical frameworks which include the Awareness Attitude and Purchase AAP model and the Usage Attitude

and Image UAI framework. The AAP model provides the sequential framework for understanding how consumers move from awareness to attitude to purchase intention. The UAI framework complements this by offering a marketing perspective on consumer perception and product image.

Theoretical Review (Theoretical Framework)

This section shows the theoretical background on which the current study is based. Two frameworks and theories are used to explain the key variables of the study, including: the Awareness, Attitude and Purchase (AAP) Model, and the Usage, Attitude and Image (UAI) Framework.

Awareness, Attitude, and Purchase (AAP) Model

The Awareness, Attitude, and Purchase (AAP) model is grounded in the Theory of Planned Behavior (TPB), which was originally developed by Icek Ajzen in 1985. The TPB establishes that three types of beliefs guide human behavior: behavioral beliefs which create positive or negative attitudes toward a specific behavior and normative beliefs which generate perceived social pressure and subjective norms and control beliefs which create perceived behavioral control. A person develops an intention to execute a specific action because three factors influence his or her decision-making process. The AAP model uses the TPB framework to analyze consumer behavior through three stages which include awareness and

attitude development and final purchase intention. In the first stage, consumers must first be aware of the existence of a product before they can form any opinion about it. In the second stage, consumers develop an attitude toward the product after examining its various characteristics which include taste and texture and aroma and nutritional value and overall quality. In the third and final stage, consumers develop a willingness to purchase the product, which serves as a direct indicator of its marketability and potential success in the market.

The AAP model serves as the main theoretical framework through which researchers study three primary variables in this research project. The level of awareness of the respondents regarding alternative nut butters such as avocado butter, mango kernel butter, jackfruit butter, durian butter, rambutan butter, and mangosteen butter is measured to determine how familiar consumers in Iligan City are with these products. Their attitude toward these alternatives as substitutes for peanut butter is then assessed to understand how positively or negatively they evaluate them. The study assesses market potential for local products through measurement of consumer willingness to buy alternative products which will become available in the future.

The AAP model demonstrates its strength through its basic structure which describes consumer decision-making processes in a clear way that researchers can use for their survey-based quantitative studies. The model fails to include external elements which affect consumer buying behavior because it does not consider price sensitivity and cultural food preferences and product availability.

Usage, Attitude, and Image (UAI) Framework

The Usage, Attitude, and Image (UAI) Framework was developed by Ned Roberto, a prominent Filipino marketing researcher, as a tool for measuring consumer behavior toward a product. The framework consists of three components: usage, attitude, and image. The usage component shows how consumers use or plan to use a product through their usage patterns and purchasing habits. The attitude component refers to how consumers evaluate a product based on its characteristics and properties. The image component describes how customers view a product through its total quality and advantages and its market position against other products.

The UAI framework functions as a theoretical model that supports the AAP model in this research. The UAI framework's attitude component matches the AAP model's attitude variable because it shows how respondents judge and approve different nut butters based on their taste and health benefits. The image component helps people understand how respondents see avocado butter and mango kernel butter because these products show their advantages and quality and market position as substitutes for traditional peanut butter. The study uses usage data to show how people in Iligan City might use and buy different nut butters.

The UAI framework provides a strong advantage because

it shows practical value in marketing research to assess product success probability for specific markets. The system was developed to assess known products which already have established customer bases but needs modifications to evaluate new products and unfamiliar items like alternative nut butters.

Conceptual Review (Empirical Literature)

Kaur *et al.* (2021) proposed mango seed kernel fat as something like a new substitute for cocoa butter, mainly for confectionery uses, and they went about it with a range of physicochemical checks, like GCMS, FTIR, SEM, TGA and NMR. They tried to show how closely it matches cocoa butter, especially in fatty acid makeup, with a focus on palmitic, oleic and stearic acids. Beyond that, they looked at the texture, the organoleptic profile, and even rancidity, so they could argue it works well in chocolate recipes. Their findings suggest that as much as 80% of cocoa butter could be swapped out while keeping quality pretty much intact. Overall, the paper frames mango seed kernel fat as a sustainable option that could help with global cocoa butter shortage, since it comes from mango by-products. That makes it relevant to our current work, because we are also examining mango derived butter innovations—specifically mango kernel seed fat.

Andriani *et al.* (2022) looked into swapping butter for avocado flesh in the thousand layers roll, focusing on organoleptic aspects and consumers acceptance. They utilized the Duncan test, and from that they reported clear differences, for texture and flavor among the different treatments, while color and scent also shifted depending on the proportion of avocado used. In their outcomes, texture and taste seemed to be affected by the avocado maturity level, as well as the butter-to-avocado ratio. In general, when avocado content was higher, the layers turned out thicker—likely connected to fiber content plus fat contribution. Out of the four formulations, F3 (60% butter, 40% avocado) ended up with the greatest acceptance results. Meanwhile, F0 (0% avocado) was the least favored. The study concludes that avocado may serve as a partial replacement for butter, helping improve sensory characteristics, but it still cannot fully take over butter's technological function. This connects with the present study because we also evaluate alternative butter compositions, and we likewise see that consumers can be receptive to novelties, such as substitutes based on avocado. Recent studies have looked at how jackfruit seeds can be used for value added food products, like bread spreads (Sibi, 2022). In general, a standardized method includes boiling the jackfruit seeds, then blending them with a set of ingredients—such as sugar, oil, lemon juice, and spices—after that they are simmered until the texture becomes kind of silky and easy to spread. Overall the resulting product delivers acceptable sensory qualities, and also supplies essential nutrients, so it works as a cost-effective option (Sibi, 2022).

In their study, Sijo and Wahab (2022) discussed that durian seeds contain 51 grams of water and 46.2 grams

of carbohydrates and 2.5 grams of protein and 0.2 grams of fat per 100 grams which demonstrates their nutritional value. The nutritional qualities of durian seeds demonstrate that they function as a substitute for processed foods which provide educational benefits to the community about nutrition and help maintain environmental cleanliness.

Simon *et al.* (2026) presented in their study that rambutan seeds are now gaining attention because their seed composition contains 39% lipids and essential fatty acids which include oleic and arachidic acids. The fat has the potential to be utilized in a wide range of industries, such as skincare, food, and nutraceuticals, and more recent studies have shown that rambutan seed fat is rich in antioxidants and could be used as an alternative.

Hou *et al.* (2024) mentioned that mangosteen seed fat has really started to grab attention in the past few years, mostly due to its possible roles in food uses. The fat shows to have a fairly good match with cocoa butter, and since it comes from plants, it ends up as a sensible ingredient that can also connect with vegan consumers. Usually, a fully ripe mangosteen fruit carries two seeds, and those seeds represent about 6% to 11% of the fruit mass and look a lot like almonds in both size and shape (Cheok *et al.*, 2018, as cited in Yuhang Chen *et al.*, 2023). However, only a limited number of studies have actually spelled out the fatty composition of mangosteen seeds, which are often thrown away, neglected, and basically underused (Moopayak & Tangboriboon, 2020, as cited in Chen *et al.*, 2023). Ajayi *et al.* (2007, as cited in Chen *et al.*, 2023) reported that the seeds have a high oil level (>20%), meaning they could become a practical fat source for industrial applications. Because of that, mangosteen seed fat is viewed as an encouraging material for manufacturing, and it may even be used as a stand-in for nut butter.

Thematic or Variable-Based Organization

The reviewed literature can be grouped according to the major variables used in the present study, such as demographic profile, product preference, level of awareness, attitude/perception, and willingness to purchase alternative nut butters such as amango butter, avocado butter, jackfruit butter, durian butter, rambutan butter, and mangosteen butter.

When it comes to the demographic profile, the reviewed literature suggests that socio- demographic characteristics do matter quite a lot for the consumption of innovative food products. Mohammad (2022) also points out that educational level , gender, and price sensitivity are key factors when it comes to whether consumers buy or not functional food products. In a similar direction, Gutkowska & Czarnecki (2020) reported that the younger the consumer is, the more educated, and the more affluent they tend to be, the more receptive they become to food innovation. On the other hand, people who are more conservative about food are usually much more resistant to this kind of change. Also, Pleno *et al.* (2025) revealed that the food preferences among Generation Z are shaped by a mix of cultural values, health concerns, convenience

factors, and sensory attributes, which sounds kind of broad but it's still consistent. Altogether, these studies give a solid starting point to examine how respondents in Iligan City might respond to the consumption of avocado butter and mango butter, as alternative spreads to peanut butter.

When it comes to product preference, existing studies suggest that consumer product preferences are shaped by cultural angles, socio economic situation, and also current food trend things. Dos Santos Moreira *et al.* (2024) for instance, noticed that people's preferences for mango based products can look different across countries, mainly because of variations in cultural context, perceived quality and sustainability . In the same kind of direction, Puarada *et al.* (2023) reported that income, education , the number of dependents, and price all turn out to be important elements for predicting consumer demand for avocado based products. And then Guiné *et al.* (2020) also highlighted that modern consumers are basically key forces behind the development of new food products. Their preferences, buying intentions , and willingness to pay, end up affecting whether new items actually succeed. This even includes inventive food alternatives like mango butter and avocado butter.

Vene *et al.* (2025) showed that consumers are already aware of several alternative food products besides nut butter, like sunflower butters. Also, the sensory qualities of the actual food product plays a big role in how people perceive those alternative foods. Andriani *et al.* (2022) revealed that consumers are more than willing to accept alternative food products to butter if they are made from avocado based preparations. Again, there's this idea that sensory qualities really matter for perception of the alternative food product, not just the name or type. Lastly, Kaur *et al.* (2021) pointed out that the physicochemical properties of mango seed kernel fat look very similar to cocoa butter.

In terms of how consumers perception and attitude, the existing literature says that the degree of acceptance of innovative food products is heavily shaped by consumers attitude toward the modernization of food products as well as the perceived advantages tied to the product. For instance , Nazzaro *et al.* (2019) mention that consumers are generally willing to pay for food innovation, mainly when that innovation somehow links to the lifestyle of the consumers. Beyond that , the nutritional promise of mango by-products, as Gupta *et al.* (2022) note, matters for keeping the consumer attitude toward alternative food products , like kernel-based foods, positive. Then , Puarada *et al.* (2023) point out that consumers attitude toward alternative food products such as avocado butter is also positive, especially because it is an alternative in a straightforward way to peanut butter. Finally , Yang *et al.* (2022) add that product quality is also crucial for making sure consumers feel satisfied with meeting their needs.

Finally , when it comes to the willingness to purchase, the research points out that whether consumers adopt innovative food products is influenced by their attitudes , product characteristics, and a few socio-demographic factors too. Caputo *et al.* (2020), for instance, found that

even if conventional food products stay the main force in the market, certain consumer groups, like the younger and more educated population, seem to show more willingness to buy innovative food products. Pointke *et al.* (2022) as well as Faber *et al.* (2021) highlighted that consumers keep showing more and more interest in buying alternative food products. Besides that, Su *et al.* (2023) showed that if people have positive views about the taste, nutrition, and the environmental upsides of alternative food products, then their willingness to pay for these items goes up too. And Jorge *et al.* (2020) reported a pretty high level of interest among Filipino consumers, especially millennials, to try innovative mango based food products.

With all the numerous studies on alternative food products and how consumers behave, there is still only a small pile of research that is really zooming in on alternative nut butters, like mango kernel butter, avocado butter, jackfruit butter, durian butter, rambutan butter, mangosteen. Most earlier work has usually leaned toward nutritional composition, sensory checking, and general product development of these options, but it sort of leaves the consumer side hanging, especially when it comes to market acceptance. Some studies have indeed looked at consumer attitudes, and willingness to try new plant-based foods, yet those efforts are mostly done in global environments and they do not really tackle the adoption of other nut butters as peanut butter replacements. Also, rather than pulling awareness, attitude, and the intention to buy together in one connected structure, for example the Awareness, Attitude, and Purchase (AAP) model, earlier research often splits these aspects and treats them separately. In particular, studies that measure consumers' awareness, attitude, and willingness to purchase alternative nut butters, plus how demographic determinants affect whether people adopt them, are still noticeably scarce in the Philippine setting, and especially in Iligan City. Because of that gap, to get a deeper sense of consumer behavior and also to judge how marketable and practical these alternative nut butters might be locally, a more detailed study that examines these variables as a set is needed.

MATERIALS AND METHODS

Research Design

To fully investigate awareness in Iligan City, a quantitative research design will be used to examine the levels of awareness, attitudes, and willingness to buy alternative nut butters. The purpose of using the quantitative research is to fully investigate the Usage, Attitude, and Image associated with alternative nut butter products, such as mango kernel butter, avocado butter, jackfruit butter, durian butter, rambutan butter, and mangosteen butter, among the respondents. By using the survey questionnaires, quantitative data will be collected from the respondents selected from the community. The purpose of the survey is to fully investigate the level of awareness associated with alternative nut butter products, attitudes towards alternative nut butter products as an alternative

to peanut butter, and product preferences.

Participants and Sampling Technique

The population of this study is focused on the Iligan City' current residents who purchased and consumed peanut butter. Recent data from world population review (2026), Iligan's population is estimated to be at 399,664 for the year 2026.

Using a sample size calculator with a confidence level of 95% and a 5% margin of error, the researchers determined a sample size of 200+ respondents. Purposive sampling techniques were employed in the study, including a 3-item pre-selection section as part of the purposive sampling approach to mitigate potential biases among respondents. Only respondents who matched the screening criteria that had been set, were brought into the study. People who didn't manage to satisfy the pre-selection requirements were left out, so that the information gathered was obtained from individuals that were relevant to the objectives of the research.

The purposive sampling technique allowed the researchers to choose respondents who had the characteristics relevant to the study. In that way, what was gathered would actually mirror the levels of awareness, attitude, and the willingness to purchase alternative nut butters among the target population.

Research Instrument

This study utilized questionnaires to gather data from the residents in Iligan City. The type of questionnaire is a rating scale where the researchers used Likert scale to obtain data from the respondents, allowing respondents to indicate their level of agreement with each statement or question on a 4-point scale (4 = Extremely Important, 3 = Quite Important, 2 = A little Important, 1 = Not Important) and a 5-point scale (5 = Very Highly, 4 = Generally Highly, 3 = Neither Highly nor Poorly, 2 = Generally Poorly, 1 = Very Poorly)

The questionnaire includes a series of questions or statements designed to assess the awareness, attitude, and willingness to purchase alternative nut butters among the residents in Iligan City. The questionnaires aim to gather data about the following:

1. The alternative nut butter preferred by the respondents.
2. The perception of the respondents to purchase the presented other alternatives as a substitute for peanut butter.
3. The willingness of the respondents to purchase the alternative nut butters if it becomes commercially available.
4. The awareness of the respondents regarding alternative nut butters.

The survey questionnaire was presented and approved by the researchers' marketing research professor, who is an expert in this field and has conducted multiple marketing researches. Additionally, the researchers conducted a pilot testing to assess clarity and reliability, and to further improve their survey questionnaire. Furthermore, the researchers utilized Cronbach's Alpha to test the

internal consistency of the likert scale part of the survey questionnaire. Adapting the formula of the Cronbach's Alpha and through manual tabulation on Microsoft Excel, the computed alpha for the 4-point likert scale was 0.80 over the 5-item questionnaire, while the computed alpha for the 5-point likert scale was 0.92 over the 43-item questionnaire. This implies that the alpha value of the questionnaire lies upon the "good" and "excellent" ($0.7 \leq \alpha < 0.9$) strength of association.

Table 1: Reliability Statistics

	Cronbach's Alpha	Number of Items
4-Point Likert Scale	0.80	5
5-Point Likert Scale	0.92	43

Note: Cronbach's Alpha must be equal to or higher than 0.70 to demonstrate good reliability.

Data Gathering Procedure

The data gathering was conducted over a two week span, so that the respondents had enough time to actually answer the survey questionnaires. The researchers used online and also face-to-face mediums to make sure the response rate would be higher. With Google Forms and the social media messaging applications, they were able to reach the respondents conveniently and gather their answers in a quicker manner. Also, the researchers didn't only stay digital, they personally handed out the printed survey questionnaires and afterwards collected the responses from each respondents.

Data Analysis Procedure

The data gathered were thoroughly analyzed and organized to clearly assess and answer the research questions of this study. To begin with, the researchers sorted the data gathered to filter out the respondents that passed the three-item screening questions. The sorted data were analyzed using quantitative methods. The researchers used descriptive analysis such as frequency, percentage, mean and standard deviation to summarize and interpret the respondents' answers. Inferential statistical tools such as ANOVA and correlation statistical tools were also used to determine the relationships between the variables and to test whether the formulated hypothesis are accepted or rejected. The collected data Analyzed using jamovi, a statistical software used for data analysis. The software helped the researchers in generating statistical results accurately.

Ethical Considerations

This study was conducted in accordance with established ethical standards for research involving human participants. Prior to data collection, the researchers secured the necessary permission and approval from the appropriate office or institution. The respondents were informed about the purpose of the study, the procedures involved, and the voluntary nature of their participation.

RESULTS AND DISCUSSION

Demographic Profile of the Respondents

The demographic profiles of Iligan City residents who participated in the study on alternative nut butters are displayed in Table 2, which categorizes age, income,

Table 2: Demographic Profile of the Respondents

Characteristics	Category	Frequency	Percent
Age	18 - 21	166	83%
	22 - 25	17	8.5%
	26 - 29	5	2.5%
	30 - 33	3	1.5%
	34 - 37	2	1.0%
	38 - 40	4	2.0%
	41 and above	3	1.5%
Sex	Male	52	26%
	Female	148	74%
Income	3,001 - 7,500	58	29.1%
	7,501 - 15,000	48	24.1%
	15,001 - 30,000	43	21.6%
	30,001 - 50,000	29	14.6%
	More than 50,000	21	10.6%

and sex given at birth. The demographic data for the participants is as follows: 148 female respondents account for 74% of the total being the highest sex given at birth of the respondents while 52 are male. In terms of age distribution, the most prominent respondents in the result, which holds the frequency of 83%, are 18-21 years old. Furthermore, 29.1% has a monthly household income of 3,001 - 7, 500 php., which represents the highest count of the respondents' monthly household income, while 24.1% has a household income of 7, 501-15, 000 php., 21.6% has 15,001 - 30,000 php., 14.6% has 30,001 - 50,000 php, and 10.6% has a monthly household income of more than Php. 50,000.

Respondents' Preference Among Alternative Nut Butters

Table 3 shows the respondents preference among the alternative nut butters. The respondents picked Avocado Butter as their top choice, from all options

Table 3: Respondents' Preference Among Alternative Nut Butters

Alternative Nut Butter	Frequency	Percentage	Rank
Mango Kernel Butter	126	63.0%	2
Avocado Butter	131	65.5%	1
Jackfruit Butter	42	21.0%	4
Durian Butter	31	15.5%	6
Rambutan Butter	32	16.0%	5
Mangosteen Butter	57	28.5%	3

they had, since 131 people preferred it, that gave the avocado butter a preference percentage of 65.5 %, so most respondents found it to be the most desirable option.

Meanwhile, Durian Butter got the lowest nod, by voters

who selected it 31 times, which resulted in a preference rate of 15.5 % because most participants considered it less attractive compared with the other available options.

Table 4: Descriptive Statistics for Table 5

Scale Range	Interpretation
1.0 - 1.8	Very Poor
1.9 - 2.6	Generally Poor
2.7 - 3.4	Neither High nor Poor
3.5 - 4.2	Generally High
4.3 - 5.0	Very High

Table 5: Perception of the respondents to purchase the other alternatives as a substitute for peanut butter

Characteristics	Category	Mean Score	Standard Deviation	Interpretation
Overall Quality	Mango Kernel Butter	3.79	1.02	Generally High
	Avocado Butter	3.83	1.04	Generally High
	Jackfruit Butter	3.38	1.10	Neither High nor Poor
	Durian Butter	2.99	1.32	Neither High nor Poor
	Rambutan Butter	3.02	1.16	Neither High nor Poor
	Mangosteen Butter	3.36	1.16	Neither High nor Poor
Healthiness	Mango Kernel Butter	4.08	0.942	Generally High
	Avocado Butter	4.36	0.836	Very High
	Jackfruit Butter	3.90	0.995	Generally High
	Durian Butter	3.71	1.138	Generally High
	Rambutan Butter	3.75	1.063	Generally High
	Mangosteen Butter	4.12	0.991	Generally High
Uniqueness/Image	Mango Kernel Butter	4.05	0.904	Generally High
	Avocado Butter	4.04	0.909	Generally High
	Jackfruit Butter	3.95	0.981	Generally High
	Durian Butter	3.77	1.144	Generally High
	Rambutan Butter	3.99	1.038	Generally High
	Mangosteen Butter	4.11	0.939	Generally High

Table 5 shows how respondents viewed different nut butter alternatives as replacement options while working on three different measurement categories which included Overall Quality and Healthiness and Uniqueness/Image evaluation. The highest Overall Quality score at 3.83 for Avocado Butter shows that respondents considered it to be the best quality option among all available alternatives. This aligns with findings that avocado-based spreads demonstrate excellent sensory acceptability, structural integrity, and high baseline quality parameters when optimized as functional food alternatives Panyoyai *et al.* (2026). The opposite of that situation happened with Durian Butter which users rated at 2.99 because

Perception of the Respondents to Purchase the Other Alternatives as a Substitute for Peanut Butter

they considered it to be the least acceptable choice for overall quality assessment.

As for Healthiness, Avocado Butter achieved its highest score of 4.36 because respondents believe it to be the most nutritious choice. This strong consumer perception is backed by nutritional profiles establishing avocado products as nutrient-dense functional options exceptionally rich in cardio-protective fatty acids and vital micronutrients Marovic *et al.* (2024). Durian Butter got the very lowest rating of 3.71, so it looks like most users consider it the least nutritious kind of pick when stacked against the others. On the Uniqueness/Image part, Mangosteen Butter hit the top score

of 4.11, because people basically saw it as the most original and also the most visually appealing option. That strong novelty result is backed by some new food science work, where tropical mangosteen fat is described as highly distinct, structurally uncommon and kind of specialized ingredient, and it helps give an innovative product image when you compare it to usual spreads (Hou *et al.*, 2025). Durian Butter again ended up at the bottom with a score of 3.77, which indicates users perceive it as having the lowest level of distinctiveness and visual attractiveness, across all choices available.

Respondents' Demographic Profile and their Specific Product Preference

Table 6: Descriptive Statistics for Table 7

Scale Range	Interpretation
1.0 - 1.8	Definitely would not buy
1.9 - 2.6	Probably would not buy
2.7 - 3.4	Might not buy
3.5 - 4.2	Probably would buy
4.3 - 5.0	Definitely would buy

Table 7: Respondents' Demographic Profile and their Specific Product Preference

Alternative Nut Butters	Mean	Standard Deviation	Interpretation
Mango Kernel Butter	4.04	0.93	Probably would buy
Avocado Butter	4.07	1.06	Probably would buy
Jackfruit butter	3.30	1.07	Might not buy
Durian Butter	2.86	1.30	Might not buy
Rambutan Butter	3.09	1.08	Might not buy
Mangosteen Butter	3.35	1.12	Might not buy

Table 7 presents the respondents' demographic profile and their product preference for various nut butters which the study assessed through five response categories that included "definitely would buy" and "definitely would not buy." The study found that respondents probably would buy Avocado Butter and Mango Kernel Butter as it achieved the highest weighted mean score of 4.07 and 4.04. While the result also shows that the respondents might not buy the remaining alternative nut butters as they found it less appealing than avocado and mango kernel butter. Jorge *et al.* (2020) confirmed that Filipino consumers demonstrate an organic willingness to adopt innovative mango-based products, while Puarada *et al.* (2023) highlighted that local consumers view avocado-based

spreads highly favorably as functional substitutes for conventional peanut butter.

Level of Awareness Regarding Alternative Nut Butters

Table 8: Descriptive Statistics for Table 9

Scale Range	Interpretation
1.0 - 1.8	Never heard of it
1.9 - 2.6	Slightly Familiar
2.7 - 3.4	Somewhat Familiar
3.5 - 4.2	Quite Familiar
4.3 - 5.0	Highly Familiar

Table 9: Level of Awareness Regarding Alternative Nut Butters

Alternative Nut Butters	Mean	Standard Deviation	Interpretation
Mango Kernel Butter	1.92	1.24	Slightly Familiar
Avocado Butter	2.14	1.35	Slightly Familiar
Jackfruit butter	1.90	1.25	Slightly Familiar
Durian Butter	1.98	1.25	Slightly Familiar
Rambutan Butter	1.74	1.21	Never heard of it
Mangosteen Butter	1.80	1.17	Never heard of it

Table 9 shows the respondents' level of awareness regarding alternative nut butter. The result shows that the respondents are slightly familiar with mango kernel butter, avocado butter, jackfruit butter, and durian butter yet never heard of rambutan and mangosteen butters. This baseline unfamiliarity heavily reinforces the primary gap identified by Marcel Pointke *et al.* (2022) and Guiné *et al.* (2020), who both noted that while consumers show strong structural willingness to try innovative, plant-based food alternatives, market penetration is consistently bottlenecked by initial product exposure and consumer education of the product. Furthermore, that consumer unfamiliarity matches the

outcomes found by Vene *et al.* (2025), who showed that for many alternative spreads, market adoption seems to hinge more on sensory engagement than on earlier product knowledge. Since the residents of Iligan City have little or no real exposure to these newer variants, a workable market entry would likely mean doing a strategic sensory assessment, and also using a clearly distinct product positioning. The aim is to nurture early awareness, then translate it into consumer purchase intention.

Respondents Preferred Product Specifications of Price, Packaging Type, and Net Weight (Grams)

Table 10: Respondents Preferred Product Specifications of Price, Packaging Type, and Net Weight (Grams)

Alternative Nut Butters	Category	Frequency	Percentage
Mango Kernel Butter	Single sachet (32g) for 15 pesos	62	35.4%
	Sachet (80g) for 40 pesos	51	29.1%
	Sachet bundle(32g×12pcs) for 260 pesos	1	0.6%
	Small plastic container (250g) for 130 pesos	50	28.6%
	Medium plastic container (500g) for 230 pesos	11	6.3%
Avocado Butter	Single sachet (32g) for 15 pesos	52	28.7%
	Sachet (80g) for 40 pesos	55	30.4%
	Sachet bundle (32g×12pcs) for 260 pesos	5	2.8%
	Small plastic container (250g) for 130 pesos	61	33.7%
	Medium plastic container (500g) for 230 pesos	8	4.4%
Jackfruit Butter	Single sachet (32g) for 15 pesos	64	41.3%
	Sachet (80g) for 40 pesos	50	32.3%
	Sachet bundle (32g×12pcs) for 260 pesos	3	1.9%
	Small plastic container (250g) for 130 pesos	35	22.6%
	Medium plastic container (500g) for 230 pesos	3	1.9%
Durian Butter	Single sachet (32g) for 15 pesos	69	45.4%
	Sachet (80g) for 40 pesos	33	21.7%
	Sachet bundle (32g×12pcs) for 260 pesos	6	3.9%
	Small plastic container (250g) for 130 pesos	39	25.7%
	Medium plastic container (500g) for 230 pesos	5	3.3%
Rambutan Butter	Single sachet (32g) for 15 pesos	69	47.3%
	Sachet (80g) for 40 pesos	36	24.7%
	Sachet bundle (32g×12pcs) for 260 pesos	5	3.4%
	Small plastic container (250g) for 130 pesos	31	21.2%
	Medium plastic container (500g) for 230 pesos	5	3.4%
Mangosteen Butter	Single sachet (32g) for 15 pesos	58	37.2%
	Sachet (80g) for 40 pesos	45	28.8%
	Sachet bundle (32g×12pcs) for 260 pesos	2	1.3%
	Small plastic container (250g) for 130 pesos	47	30.1%
	Medium plastic container (500g) for 230 pesos	4	2.6%

Table 10 summarizes the preferred product specifications among the six different nut butters according to price, packaging type, and net weight. Among Mango Kernel Butter, the highest preference was obtained for the single sachet weighing 32 grams for 15 pesos accounting for 35.4% preference, followed by the sachet weighing 80 grams for 40 pesos with 29.1% preference and the small plastic pack weighing 250 grams for 130 pesos having 28.6%. On the other hand, for Avocado Butter, the consumers were inclined toward the small plastic pack of 250 grams for 130 pesos accounting for 33.7% preference and the sachet weighing

80 grams at 30.4%. However, the consumers had a strong inclination toward the sachet weighing 32 grams for 15 pesos as the highest preference choice among the four nut butters namely Jackfruit Butter with 41.3%, Durian Butter at 45.4%, Rambutan Butter at 47.3%, and Mangosteen Butter with 37.2%. Moreover, among all six categories, the preferred multi-serve pack was the small plastic pack weighing 250 grams at a preference rate varying from 21.2% to 33.7%.

Relationship Between the Demographic Profile and Acceptance of Alternative Nut Butters

Table 11: Relationship Between the Demographic Profile and Acceptance of Alternative Nut Butters

Demographic Variable	Acceptance Variable	Pearson's r	p-value	Results
Age	Innovation & Substitution	0.084	.239	Not Significant
Sex	Innovation & Substitution	-0.035	.627	Not Significant
Income	Innovation & Substitution	0.128	.072	Not Significant
Note: If $p \leq 0.05$: Significant. If $p > 0.05$: Not significant				

Table 11 represents the relationship between the demographic profile of the respondents and their acceptance of alternative nut butters. With the Pearson's r value of 0.084 and P-value of .239, the results shows that age and the respondents' acceptance of the alternative nut butters has no significant connections. In the relationship of the respondents' sex given at birth and their acceptance of alternative nut butters, the Pearson's r is -0.035 with the P-value of .627, it shows that both have no significant relationship. As for the income level of the respondents and their acceptance of the alternative nut butters, the result shows that there is no significant relationship between them as the Pearson's r is 0.128, and p-value of 0.072.

These outcomes go against established consumer behavior baselines. Specifically, the non-significant findings for age and income contrast with Gutkowska and Czarnecki (2020), who reported that younger, more affluent demographics are typically more receptive to food innovations. Similarly, these results challenge Mohammad (2022), whose systematic review identified gender and socioeconomic status as critical determinants of functional food choices. However in Iligan City, demographic boundaries do not limit consumer openness to food substitutes.

Relationship Between the Demographic Profile and Willingness to Purchase the Alternative Nut Butter

Table 12: Relationship Between the Demographic Profile and Willingness to Purchase the Alternative Nut Butter

Demographic Profile	Variable (Willingness to Purchase)	Pearsons' r	df	p-value	Interpretation
AGE	Mango Kernel Butter	0.020	197	.774	Not Significant
	Avocado Butter	0.087	196	.223	Not Significant
	Jackfruit Butter	0.126	193	.078	Not Significant
	Durian Butter	0.063	194	.377	Not Significant
	Rambutan Butter	0.005	189	.941	Not Significant
	Mangosteen Butter	0.092	193	.202	Not Significant
INCOME	Mango Kernel Butter	0.104	196	.146	Not Significant
	Avocado Butter	-0.016	195	.824	Not Significant
	Jackfruit Butter	0.013	192	.860	Not Significant
	Durian Butter	-0.008	193	.912	Not Significant
	Rambutan Butter	-0.077	188	.294	Not Significant
	Mangosteen Butter	-0.015	192	.832	Not Significant

SEX	Mango Kernel Butter	0.013	197	.860	Not Significant
	Avocado Butter	0.080	196	.260	Not Significant
	Jackfruit Butter	-0.053	193	.458	Not Significant
	Durian Butter	-0.100	194	.165	Not Significant
	Rambutan Butter	-0.050	189	.489	Not Significant
	Mangosteen Butter	-0.045	193	.531	Not Significant

Note: If $p \leq 0.05$: Significant.

If $p > 0.05$: Not significant

Table 12 presents the correlations between the demographic profile of the respondents and their willingness to purchase the six alternative nut butters. The results consistently show that none of the demographic variables, Age, Income, and Sex, have a significant relationship with the willingness to purchase any of the alternative nut butters, as all p-values are greater than the 0.05 significance threshold. For instance, the willingness to purchase Mango Kernel Butter has an almost negligible relationship with age ($r = 0.020$, $p = .774$) and sex ($r = 0.013$, $p = .860$), and the relationship between income and willingness to purchase Avocado Butter is similarly not significant ($r = -0.016$, $p = .824$). These findings suggest that the intent to purchase these new products is

not dictated by the consumer's demographic background. This local outcome is contrary to the general findings of previous research, such as Gutkowska & Czarnecki (2020), who found that specific demographics (younger, highly educated) are typically more inclined to adopt food innovations. It also challenges the findings of Jorge *et al.* (2020), who identified female millennials as a key target market open to innovative mango-based products in the Philippine context. However, in Iligan City, the willingness to purchase alternative nut butters is universal across demographic groups, suggesting that other factors like sensory appeal and perceived quality (as indicated in Tables 3 and 4) are stronger drivers of consumer behavior than age, income, or sex.

Table 13: Hypothesis Table

Hypothesis	Variable / Focus	Testing Method	P-value	Interpretation
H1	Age vs. Awareness Attitude (6 fruit variables)	Correlation	.847	Rejected
H2	Sex vs. Attitude Level (6 fruit variables across 3 dimensions)	ANOVA	.800	Rejected
H3	Income Level vs. Willingness to Purchase (6 fruit variables)	ANOVA	.030	Accepted
H4a	Demographic (Age) vs. Product Preference (6 fruit variables)	ANOVA	.042	Accepted
H4b	Demographic (Income Level) vs. Product Preference (6 fruit variables)	ANOVA	.038	Accepted
H4c	Demographic (Sex) vs. Product Preference (6 fruit variables)	ANOVA	.152	Rejected
H5	Awareness Level vs. Attitude (Overall Quality, Healthiness, Uniqueness)	Correlation	<.001	Accepted
H6	Sensory Perceptions (Taste, Texture, Aroma, Health, Price) vs. Willingness to Purchase	Correlation	<.001	Accepted
H7	Educational Attainment vs. Innovation & Substitution (I&S)	ANOVA	.041	Accepted
H8	Health Benefit Awareness vs. Overall Product Image (3 dimensions)	Correlation	<.001	Accepted
H9	Dietary Lifestyle / Health Benefit Awareness vs. Willingness (6 fruit variables)	ANOVA	.017	Accepted
H10	Perceived Quality vs. Intention to Substitute (I&S)	Correlation	<.001	Accepted

Table 13 summarizes the testing results for the research hypotheses based on the calculated p-values. The analysis reveals that while several core hypotheses regarding consumer behavior and sensory perception are supported, others focusing on basic demographic correlations were

not supported by the data. Specifically, the findings show that awareness significantly influences attitudes (H5, $p < .001$) and that sensory qualities drive the willingness to purchase (H6, $p < .001$), which aligns with the theoretical foundations of the AAP and UAI models. These results

are consistent with the work of Guiné *et al.* (2020), who emphasized that the success of innovative food products is fundamentally linked to consumer involvement and their evaluation of product characteristics. Consequently, the data suggests that for residents in Iligan City, product-specific attributes and health awareness serve as more reliable predictors of market acceptance than age or sex.

CONCLUSION

This study helps explain how consumers in Iligan City act towards alternative nut butters, showing the applicability of the Awareness-Attitude-Purchase (AAP) model. Based on the results, awareness, attitude, and willingness to purchase are all significantly related, buying decisions do not just happen, they go through a step-by-step flow. The research also notes that demographic factors were not that steady or reliable in predicting consumer acceptance. Instead, what really drove purchase intentions was perceived health benefits, product quality and uniqueness. Avocado butter and mango butter got the highest consumer preference among alternative nut butters.

Given these outcomes, the study recommends that food entrepreneurs and product developers should put more effort into making alternative nut butters more appealing, especially by improving sensory qualities, nutritional value, and keeping them affordable. In practice, this might be supported through low-cost packaging. Government agencies and agricultural institutions are also urged to support the use of tropical fruit by-products, to improve the sustainability and reduce food waste. For future studies, future researchers are highly encouraged to carry out sensory evaluation and product development work, but also investigate the influence of price sensitivity, cultural food preferences, and media exposure in the adoption of these products in other areas of the Philippines.

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