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Research Article

Consumer Acceptability of Coco-Squash Spread

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Abstract:

Consumer acceptability is a crucial factor in the success of processed foods, as it directly influences purchasing decisions and market sustainability. In the competitive food industry, sensory attributes such as appearance, taste and texture play a significant role in shaping consumer preferences. Understanding these sensory perceptions helps manufacturers enhance the product quality and align with consumer expectations. A health-conscious consumer increasing seek nutritious and innovative food options, the development of acceptable and appealing processed foods becomes even more relevant. The study aimed to evaluate the consumer's level of acceptability of Coco-Squash Spread in terms of appearance, taste and consistency in the three different samples. Acceptability Score Sheet was utilized as the instrument in the research study to gather data through sensory evaluations of thirty (30) consumers as the respondents of the study. Results revealed that Sample 1 obtained a mean score of 3.7, Sample 2 achieved a mean score of 4.08, both results to acceptable and Sample 3 received a mean score of 2.9 rated as moderately acceptable. Analysis of Variance results indicated no significant differences among the three samples in terms of appearance, taste and consistency. The appearance of the samples was influenced by the proportion of squash compared to coconut milk. In terms of taste, the dominant squash taste remained noticeable despite the varying proportions among the samples. Additionally, the consistency across all samples was consistent due to the standardized preparation process, which included the same procedures for the coconut milk and squash. The study highlights the potential of Coco-Squash Spread as an acceptable food product with no significant in sensory across the evaluated samples.

Keywords: Acceptability, Coconut Milk, Consumer, Spread, Squash.

Introduction

Poor dietary habits, which contribute to obesity, diabetes, and cardiovascular diseases, have highlighted the need for food that not only provides essential nutrients but also offers health benefits. In the Philippines, the typical diet is high in fats, sugar, and salt, leading to a rising incidence of these health issues. This trend indicates a growing demand for healthier meal options that can improve overall well-being. (Nales, 2025) The study of Chen (2024) offers an in-depth examination of the distribution and composition of coconut protein. Findings indicate that 11S globulin and 7S globulin are the primary proteins present in the coconut flesh. Additionally, the study explores different methods for extracting coconut protein, including chemical, enzymatic and physical approaches. Coconut palms and oils, which have been primary sources of dietary fats in West Africa for centuries, have been criticized for their high saturated fat content. This has led to concerns about their bole in raising blood cholesterol levels and increasing the risk of coronary heart disease. Consequently, their consumption in West Africa has declined, with imported vegetable oils taking their place. However, recent studies suggests that coconut and palm oils offer health, nutrition and national development, further research is needed. Therefore, this article aims to explore of coconut and palm oils in these areas within developing countries, advocating for their reintegration into local diets. (Manjeet, 2022). The demand of coconut milk products in the food and beverage industry has risen due to their low calorie and high nutritional value. Products like coconut milk powder and coconut cream powder are popular in various recipes for their sweet and mild flavor. Additionally, coconut milk is known to its health benefits, including lowering blood pressure and cholesterol, enhancing kidney health, and reducing the risk of heart attacks and strokes. The growing preference for vegetarian diets ahs also contributed to the increased use of coconut milk products. Coconut milk, a milky-white, opaque liquid made form coconut pulp, is a common in Southeast Asian, Oceania, South Asian and East African cuisines. It is also widely used in preparing popular Southeast Asian beverages. (Singh, 2022). Coconut milk, despite of its long history of use, has faced of limited application due to perceived nutritional gaps, high saturated fat content, and lower acceptability. However, recent research suggests that the saturated fats and other plant-based compounds in coconut milk may have positive effects on metabolic health and brain function. Converting coconut milk into yogurt can enhance its functionality by improving its nutritional profile. (Gengan,2025) Traditionally, coconuts have been processed into basic products such as copra and coconut oil. However, evolving global market trends have driven the need for innovation and product diversification. This has resulted in the development of a variety of value-added coconut products, including coconut vinegar, Nata de coco, virgin coconut oil, coconut chips, coconut milk, snowball tender nuts, Neera and coconut sugar. Coconut milk and cream known for their richness in medium-chain triglycerides (MCTs) and essential nutrients are widely used both sweet and savory dishes, contributing a creamy texture and unique tropical

flavor. (Pandiselvam, 2024) Spaghetti squash (SS) (Cucurbita pepo L. subsp. Pepo) is a type of zucchini characterized by its cantaloupe-like shape, golden skin, and pumpkin-like seeds. It is also known as shark fin melon due to its flesh's resemblance to shark fin. SS typically weighs between 2 to 4 kg and consists of four main components: flesh, peel, pulp and seeds, which make up approximately 60%, 30%, 7% and 3% of its total weight, respectively. (Zhuang, 2019; Guo, 2020) In the study of Inocent (2021) it assessed the nutritional and functional properties of powder derived from two Cameroonian squash pulp species – cucurbita moschata (Yellow and Orange pulp) and Cucurbita pepo (Orange pulp) as well as squash pulp-based biscuits. The objective was to promote the inclusion of squash in the diet as a strategy to combat micronutrient deficiencies and reduce the risk of non-communicable diseases. In modern times, many products undergo food processing and preservation. The two are involved in developing a product that is considered processed food. The availability of processed food in the market is highly observed due to its convenience to consumers. The increasing demand for easy and convenient food products is now part of emerging trends. (Bantog, 2025)

Research Questions

Specifically, this study aims to answer the following questions:

1. What is the consumer's level of acceptability of the three samples of Coco-Squash Spread in terms of its appearance, taste and consistency?
2. Is there a significant difference of the consumers level of acceptability of the three samples of Coco-Squash Spread?

Conceptual Framework

Plate 1: Coconut Milk

Plate 2: Steaming of Squash

Plate 3. Blending of Coconut Milk and Squash

Plate 4. Adding the mixture and sugar in a pan

Plate 5. Stirring the mixture until thick

Plate 6. Cooked Coco-Squash Spread

Plate 7. Sterilizing of bottles for packaging

Plate 8. Final Product: Coco-Squash Spread

In conducting the study, the initial steps involved gathering the necessary raw materials and preparing the required tools and utensils. The main ingredients used were coconut milk, squash, sugar and calamansi. Sugar was used as a sweetener to balance the flavors, ensuring an appealing taste of the product. Calamansi, a citrus fruit known for its tangy flavor, was included to enhance the spread's overall taste by providing a hint of acidity, which helps to balance the richness of coconut milk.

Methodology

The study aims to evaluate the consumer's level of acceptability of Coco-Squash Spread using three different samples with same ingredients but different proportions. The research conducted a following systematic process that included the gathering of raw materials, preparation of tools and utensils, product formulation, sensory evaluation and data analysis.

Gathering of Raw Materials

Prior to production, all tools and utensils, including measuring cups, mixing bowls, cooking pans, spatulas, blender and bottles, were thoroughly cleaned and sanitized to maintain hygiene and product safety. Proper preparation of equipment ensured accurate measurements and consistency during the cooking process.

Product Formulation and Preparation

Three different formulations of Coco-Squash Spread were developed by varying proportions of coconut milk and squash. Sample 1 with higher proportion of coconut milk and moderate squash content. Sample 2, with balanced ratio of coconut milk and squash and Sample 3, higher proportion of squash with less coconut milk. The preparation involved the following steps: (1) Extraction and Preparation – coconut milk was extracted by grating and pressing mature coconuts. Squash was peeled, steamed and mashed; (2) Blending of Coconut Milk and Squash in an electric blender; (3) Cooking Process – the blended coconut milk and squash were combined in a cooking pan, followed by addition of sugar and calamansi extract. The mixture was simmered while continuously stirring to achieve the desired consistency; (4) Cooling and Storage – the finished spread was allowed to cool at room temperature before being stored in sterilized jars to ensure product safety and extended shelf life.

Research Instrument and Participants

An Acceptable Score Sheet was used to assess consumer preferences for the three samples in terms of appearance, taste and consistency. Sensory evaluation was conducted by thirty (30) respondents selected through purposive sampling. The evaluators were asked to rate each sample using 5-point Likert scale, where: 5 – Highly Acceptable, 4 – Acceptable, 3 – Moderately Acceptable, 2 – Least Acceptable and 1 – Not Acceptable.

Statistical Treatment of Data

The collected data were statistically analyzed to determine the mean score for each sensory attribute. Analysis of Variance (ANOVA) was used to examine any significant differences in the level of acceptability among the three samples. According to rules of ANOVA, if the computed F value is higher than the tabulated F value, a significant difference exists, and vice versa.

Results and Discussions

1. Consumer's Level of Acceptability

The level of acceptability of the three (3) Coco-Squash Spread samples was gathered through sensory evaluation, a method commonly used to assess consumer preferences and product quality. Sensory evaluation focuses on analyzing sensory attributes such as appearance, taste and consistency, which are critical factors influencing consumer acceptability.

1.1 Appearance

Table 1. Appearance

Sample	Mean Score	Description
Sample 1	4.1	Acceptable
Sample 2	4.0	Acceptable
Sample 3	2.1	Moderately Acceptable

Legend: *5 – Highly Acceptable 4.5 – 5.0* *4 – Acceptable 3.5 – 4.49*
3 – Moderately Acceptable 2.5 – 3.49 *2 – Least Acceptable 1.5 – 2.49*
1 – Not Acceptable 1.0 – 1.49

In terms of appearance, Sample 1 received a mean score of 4.1 and Sample 2 scored 4.0, both falling under the scale of "Acceptable". On the other hand, Sample 3 obtained a mean score of 2.1, indicating a scale of "Moderately Acceptable". This suggests that the visual appeal of Sample 1 and Sample 2 was more favorable compared to Sample 3, which may be attributed to differences in the proportion of squash and coconut milk, affecting color and presentation.

1.2 Taste

Table 2. Taste

Sample	Mean Score	Description

Sample 1	4.2	Acceptable
Sample 2	4.16	Acceptable
Sample 3	4.0	Acceptable

Legend: *5 – Highly Acceptable 4.5 – 5.0* *4 – Acceptable 3.5 – 4.49*
3 – Moderately Acceptable 2.5 – 3.49 *2 – Least Acceptable 1.5 – 2.49*
1 – Not Acceptable 1.0 – 1.49

In terms of taste, all three samples were rated as "Acceptable" but with varying mean scores. Sample 1 with a mean score of 4.2, the highest among the three, Sample 2 with a mean score of 4.16 and Sample 3 with a mean score of 4.0. Although the samples shared the same acceptability scale, Sample 1 received the highest mean score, indicating a slightly better taste perception.

1.3 Consistency

Table 3. Consistency

Sample	Mean Score	Description
Sample 1	3.7	Acceptable
Sample 2	4.08	Acceptable
Sample 3	2.9	Moderately Acceptable

Legend: *5 – Highly Acceptable 4.5 – 5.0* *4 – Acceptable 3.5 – 4.49*
3 – Moderately Acceptable 2.5 – 3.49 *2 – Least Acceptable 1.5 – 2.49*
1 – Not Acceptable 1.0 – 1.49

For the consistency of the spread, the mean scores were as follows; Sample 1 with a mean score of 3.7 rated as "Acceptable", Sample 2 with a mean score of 4.08 rated as "Acceptable". Sample 3, however, was rated as "Moderately Acceptable", indicating a less favorable perception of its texture. This variation in texture acceptability of squash used, affecting the spread's smoothness and spreadability.

2. Significant Difference of the Consumer's Level of Acceptability of Coco-Squash Spread

To determine whether there were significant differences in the level of acceptability among three Coco-Squash Spread samples, Analysis of Variance (ANOVA) was utilized. ANOVA is a statistical method that separates the total viability into components attributable to different sources of variation. Specifically, it compares the variance due to the treatment (product) or replication against the error variance (uncontrolled) to assess statistical significance.

Table 4. Computed F-value

Parameter	Critical Value	Computed Value	Analysis
Appearance	0.05	0.196	Null hypothesis accepted
Taste	0.05	0.550	Null hypothesis accepted
Texture/Consistency	0.05	0.174	Null hypothesis accepted

2.1 Appearance

The ANOVA results revealed no significant difference in the appearance of the three Coco-Squash Spread Samples. This suggests that the variations in color were not substantial enough to affect consumer acceptability. The proportion of squash used in the formulation played a major role in determining the appearance of the spreads, as it influenced the color intensity among the samples. However, this difference was not statistically significant, possibly because the coconut milk content provided a consistent base color that balanced out the variations.

2.2 Taste

Similarly, no significant difference as found in terms of taste among the three samples. Although each sample had a different proportion of ingredients, the strong favor of squash was consistently prominent, making it easy for respondents to recognize and accept the taste across all variations. This indicates that the flavor profiles were generally well-balanced and did not differ significantly despite the adjustments in squash and coconut milk ratios.

2.3 Consistency

The ANOVA results no significant difference in consistency among the three Coco-Squash Spread Samples. This consistency in sensory evaluation can be attributed to the standardized preparation process applied to all samples. The controlled preparation procedures minimized textural differences, resulting in comparable consistency across the three variations. This suggests that the ingredient proportions did not significantly affect the texture, as the processing method was a dominant factor in determining the final product's mouthfeel and spreadability.

Conclusions

The three samples of Coco-Squash Spread were generally acceptable to consumers in terms of appearance, taste and consistency.

Sample 2 received the highest mean scores, particularly in texture, but shared the same acceptability scale as Sample 1, indicating no significant preference. In terms of appearance (color), no significant difference was observed among the three samples. Although the proportion of squash affected the color, the variations were not substantial enough to influence consumer preferences. Regarding flavor, the strong, recognizable taste of squash contributed to consistent acceptability across all samples, resulting in no significant difference in flavor evaluation despite varying ingredient proportions. For texture/consistency, the uniform preparation method—including the extraction of coconut milk, mashing of squash, grinding of coconut, and consistent cooking duration—resulted in similar texture/consistency across all samples, with no significant differences observed. Overall, the study found no statistically significant differences in any of the sensory attributes (appearance, flavor, and texture/consistency) among the three samples. This suggests flexibility in the formulation without compromising consumer acceptance.

Recommendations

Future studies could experiment with additional flavor enhancers or natural colorants to enhance the sensory appeal, particularly for Sample 3, which received the lowest scores. Exploring different proportions of coconut milk and squash is also recommended to further investigate their effects on texture and flavor. Incorporating other natural sweeteners or spices might improve overall acceptability. To validate the findings and ensure product marketability, a broader sensory evaluation with a more diverse group of respondents should be conducted. Additionally, complementing the sensory evaluation with a nutritional analysis would help highlight the health benefits of Coco-Squash Spread, appealing to health-conscious consumers. Given the high acceptability, developing Coco-Squash Spread as a commercial product is recommended. Its unique combination of coconut and squash could be promoted as a nutritious and locally sourced alternative to conventional spreads.

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