ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 5 (May 2026)

Sensory Acceptability of Squash (*Cucurbita maxima L.*), Carrot (*Daucus carota*), and Mixed Vegetable Okoy

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Date Submitted:
March 21, 2026

Date Accepted:
April 30, 2026

Date Published:
May 12, 2026

DOI:
10.5281/zenodo.20139888

ABSTRACT

This study aimed to determine the level of acceptability of squash (*Cucurbita maxima L.*), carrots (*Daucus carota*), and mixed vegetables okoy as an alternative to the traditional shrimp-based fritter. Specifically, it evaluated the sensory attributes of three (3) treatments in terms of appearance, taste, texture, aroma, and general acceptability, and examined whether significant differences existed among the treatments. A quasi-experimental research design was employed, involving eighty (80) third-year Bachelor of Science in Hospitality Management students from the University of Antique, Tario-Lim Memorial Campus, selected through purposive sampling. Data were collected using a structured questionnaire based on a 9-point hedonic scale. Statistical tools such as mean, standard deviation, and Analysis of Variance (ANOVA) were utilized to analyze the data. Findings revealed that the overall level of acceptability of the vegetable-based okoy was rated as "like extremely," indicating high consumer preference and satisfaction. Among the treatments, Treatment 1 obtained the highest mean rating across all sensory attributes. However, ANOVA results showed no significant differences in the level of acceptability among the three treatments in terms of appearance, taste, texture, aroma, and general acceptability ($p > 0.05$). The results suggest that squash, carrots, and mixed vegetables can be effectively utilized as alternative ingredients in okoy without compromising its sensory quality. The study highlights the potential of vegetable-based okoy as a nutritious, affordable, and sustainable food product suitable for consumers, including those with seafood allergies or dietary restrictions.

Keywords: *Vegetable-Based Okoy, Sensory Evaluation, Acceptability, Plant-Based Food, Innovation, Squash and Carrot Products*

INTRODUCTION

Food innovation plays a crucial role in addressing challenges related to nutrition, affordability, and sustainability. As consumer awareness of healthy eating increases, there is a growing demand for food products that provide both nutritional value and sensory appeal while remaining culturally relevant. In the Philippines, traditional foods such as okoy continue to be widely consumed. However, these are increasingly modified to meet modern dietary needs.

Okoy, a traditional Filipino fritter typically made with shrimp and vegetables, is valued for its crisp texture and savory taste. However, the use of shrimp presents limitations due to allergenic concerns, rising

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costs, and dietary restrictions. This has led to increased interest in plant-based alternatives that maintain traditional flavors while improving nutritional value.

Vegetable-based okoy using squash (Cucurbita maxima L.), carrots (Daucus carota), and mixed vegetables offers a promising alternative. Squash provides beta-carotene, antioxidants, and dietary fiber, while carrots contribute vitamin A, color, and texture. Mixed vegetables enhance nutritional diversity and sensory appeal.

The development of vegetable-based okoy aligns with the global shift toward sustainable and plant-based diets. Despite its potential benefits, consumer acceptability remains a key factor in determining its success. Sensory evaluation assessing appearance, taste, texture, aroma, and overall acceptability is widely used to measure consumer preferences.

Thus, this study aimed to determine the sensory acceptability of squash, carrots, and mixed vegetables okoy as a healthier and sustainable alternative to the traditional shrimp-based version.

Statement of the Problem

This study aimed to determine the sensory acceptability of squash (*Cucurbita maxima L.),* carrots (*Daucus carota*), and mixed vegetables okoy.

Specifically, it seeks to answer the following questions:

1. What is the level of sensory acceptability of squash (*Cucurbita maxima L.),* carrots (*Daucus carota)*, and mixed vegetables okoy in terms of appearance, aroma, taste, texture, and general acceptability in three (3) treatments when taken collectively?

2. Is there a significant difference in the level of sensory acceptability of squash (*Cucurbita maxima L.*), carrots (*Daucus carota*), and mixed vegetables okoy in terms of appearance, aroma, taste, texture, and general acceptability in three (3) treatments when taken collectively?

Conceptual Framework

This study was grounded on the principles of sensory evaluation, a scientific discipline used to evoke, measure, analyze, and interpret human responses to the characteristics of food as perceived through the senses of sight, smell, taste, touch, and hearing (Stone & Sidel, 2020). Sensory evaluation is widely employed in food product development to determine consumer acceptability and guide improvements in formulation, texture, flavor, and overall quality.

The sensory evaluation process typically involves measuring specific attributes, including appearance, aroma, texture, flavor, and overall acceptability, which together influence a consumer's decision to adopt or reject a product (Meilgaard, Civille, & Carr, 2021). For vegetable-based products like squash, carrots, and mixed vegetables okoy, sensory characteristics are particularly crucial because consumer acceptance is often driven by the product's crunchiness, color, and flavor profile, which should align with traditional expectations while offering unique nutritional benefits (Muller et al., 2021).

In this study, sensory evaluation serves as the guiding framework to assess the acceptability of squash, carrots, and mixed vegetables okoy. A structured sensory test, such as a hedonic scale ranging from "dislike extremely" to "like extremely," was employed to quantify consumer preferences and perceptions (Stone & Sidel, 2020).

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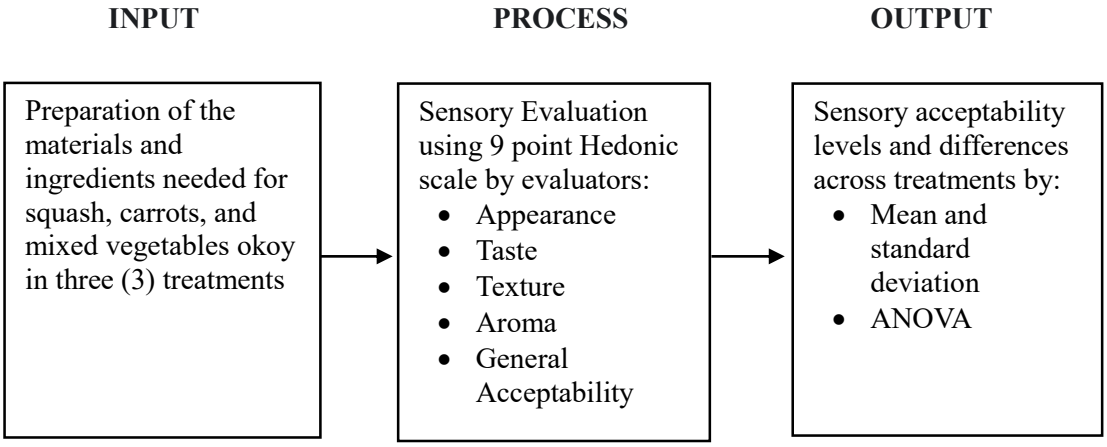

Figure 1. *Conceptual Framework*

METHODS

Research Design

This study employed a quasi-experimental research design to evaluate the sensory acceptability of vegetable-based okoy in terms of appearance, aroma, taste, texture, and general acceptability in three (3) treatments. This design allows the assessment of cause-and-effect relationship without random assignment.

Research Locale

This study was conducted at the University of Antique, Tario-Lim Memorial Campus, Tibiao, Antique, Philippines.

Sampling Technique

This study employed eighty (80) respondents were selected using purposive sampling. The participants were third-year Bachelor of Science in Hospitality Management students who evaluated the developed okoy products.

Data Gathering and Instrument

Data were collected using a structured questionnaire based on a 9-point hedonic scale ranging from "dislike extremely" to like extremely." The instrument measured five attributes:

- Appearance
- Aroma
- Taste
- Texture
- General Acceptability

The instrument underwent content and face validation by experts and achieved a Cronbach's alpha of 0.87, indicating high reliability.

Procedure

Three (3) treatments of vegetable-based okoy were prepared with varying proportions of squash, carrots, and mixed vegetables. Respondents evaluated the sample during a controlled sensory testing session. Data were collected, tabulated, and analyzed statistically.

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RESULTS AND DISCUSSION

Level of Sensory Acceptability of Squash (*Cucurbita maxima L.*), Carrots (*Daucus carota*), and Mixed Vegetables Okoy in Three 93) Treatments as Assessed by the Respondents in Terms of Appearance, Aroma, Taste, texture, and General Acceptability

For the treatment 1, the result showed that appearance has the highest mean score of 8.43 and interpreted as "Like extremely" with the standard deviation of 0.91. General acceptability has the lowest mean score of 8.08 and interpreted as "Like very much" with the standard deviation of 0.90. For the Treatment 2, the result showed that appearance has the highest mean score of 8.41 and interpreted as "Like extremely" with the standard deviation of 0.94. General acceptability has the lowest mean score of 8.08 and interpreted as "Like very much" with the standard deviation of 0.90. And for the Treatment 3, the result showed that appearance has the highest mean score of 7.82 and interpreted as "Like very much" with the standard deviation of 0.87. Aroma has the lowest mean score of 7.63 and interpreted as "Like very much" with the standard deviation of 0.85. When taken as a whole, the result showed that the Treatment 1 has the highest mean score of 8.24 and interpreted as "Like extremely" with the standard deviation of 0.15.

Table 1 showed that Treatment 1 was the highest score in terms of Appearance, Aroma, Taste, Texture, General Acceptability because the Treatment 1 is high acceptable. Treatment 1 of this study consist of more squash, carrots and mixed vegetables compares to other treatment, and it balances the mixture that meets the good quality to the respondents in terms of in appearance, aroma, taste, texture, general acceptability.

This result means that the product of treatment 1 is highly acceptable, indicating very strong preference and satisfaction among respondents.

Table 1. *Level of Sensory Acceptability of Squash (Cucurbita maxima L.), Carrots (Daucus carota), and Mixed Vegetables Okoy in Three 93) Treatments as Assessed by the Respondents in Terms of Appearance, Aroma, Taste, texture, and General Acceptability*

Dimensions	Treatment 1			Treatment 2			Treatment 3		
	Mean	Standard Deviation	Description	Mean	Standard Deviation	Description	Mean	Standard Deviation	Description
Appearance	8.43	0.94	Like extremely	8.41	0.93	Like extremely	7.82	0.87	Like very much
Aroma	8.13	0.90	Like extremely	8.13	0.90	Like extremely	7.63	0.85	Like very much
Taste	8.38	0.93	Like extremely	8.38	0.93	Like extremely	7.67	0.85	Like very much
Texture	8.22	0.91	Like extremely	8.22	0.91	Like extremely	7.68	0.85	Like very much
General Acceptability	8.08	0.90	Very Much Acceptable	8.08	0.90	Like very much	7.68	0.85	Like very much

Differences in the Level of Sensory Acceptability of Squash (Cucurbita maxima L.), Carrots (Daucus carota), and Mixed Vegetables Okoy as Assessed by the Respondents in Terms of Appearance, Aroma, Taste, Texture, and General Acceptability

As reflected in Table 2, no significant differences existed in the level of acceptability of squash, carrots and mixed-vegetables okoy as assessed by the respondents in terms of appearance, p-value = 0.29698 > 0.05, aroma, p-value = 0.09555 > 0.05, taste, p-value = 0.21577 > 0.05, texture, p-value = 0.38082 > 0.05, and general acceptability, p-value is 0.06512 > 0.05. Thus, the null hypothesis which states that there are no significant differences in the level of acceptability of squash, carrots, and mixed vegetables

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okoy as assessed by the respondents in terms of appearance, aroma, taste, texture, and general acceptability was not rejected.

Table 2. *Differences in the Level of Sensory Acceptability of Squash (Cucurbita maxima L.), Carrots (Daucus carota), and Mixed Vegetables Okoy as Assessed by the Respondents in Terms of Appearance, Aroma, Taste, Texture, and General Acceptability*

Dimension	Computed f	p-value	Remarks
Appearance	1.50892	0.296	Not Significant
Aroma	2.36226	0.095	Not Significant
Taste	1.53958	0.215	Not Significant
Texture	0.96783	0.380	Not Significant
General Acceptability	2.75081	0.065	Not Significant

CONCLUSION

This study concluded that squash (*Cucurbita maxima L.),* carrots (*Daucus carota*), and mixed vegetables okoy is an acceptable alternative to traditional shrimp-based okoy. The product demonstrates favorable sensory characteristics in terms of appearance, aroma, taste, texture, and general acceptability.

The findings highlight the potential of vegetable-based food innovations in promoting healthier and more sustainable dietary options. Additionally, proper formulation and balance of ingredients are essential in achieving high consumer acceptability.

This study contributes to food innovation by supporting the use of locally available vegetables in developing nutritious and marketable products.

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