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Sensory Evaluation as a Tool in Determining the Acceptability of Polvoron with Turmeric (Curcuma longa L.) Powder

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Abstract : The study measured the acceptability of turmeric powder mixed with the usual polvoron recipe. It aimed to answer the following questions: (1) What is the level of acceptability of turmeric powder as to 20 grams, 40 grams, 60 grams, proportion as evaluated as to appearance, taste, texture, and aroma? (2) Is there a significant difference in the acceptability of 20 grams, 40 grams, and 60 grams proportion of turmeric powder when evaluated as to appearance, taste, texture, and aroma? This study used a convenience sampling technique, which involved one hundred twelve (112) students and faculty and staff of Iloilo State College of Fisheries. Respondents were given a sensory evaluation checklist to evaluate the product. Mean and overall acceptability levels were measured with the use of a hedonic scale to answer statements 1 and 2. The three proportions, 20 grams of turmeric powder, 40 turmeric powder, and 60 grams of turmeric powder, underwent a sensory evaluation to determine their acceptability. The evaluation showed that as to 20 grams of turmeric powder, both students and faculty staff evaluated in terms of appearance as "highly acceptable," while texture, taste, and general acceptability both students and faculty and staff evaluated the product as "extremely acceptable" and in terms of aroma, students evaluated as "highly acceptable," and faculty and staff evaluated as "extremely acceptable." As to 40 grams of turmeric powder, in terms of appearance, students evaluated the product as "highly acceptable," while faculty and staff evaluated the product as "extremely acceptable." In terms of aroma, texture, taste, and general acceptability, both students and faculty, as well as staff, evaluated the product as "extremely acceptable." As to 60 grams of turmeric powder, in terms of appearance, students evaluated the product as "highly acceptable," while faculty and staff evaluated the product as "extremely acceptable." In terms of aroma, texture, taste, and general acceptability, both students and faculty, as well as staff, evaluated the product as "extremely acceptable." There is no significant difference between variables. The result shows that the p-value between variables is higher than the .05 alpha level of significance. Therefore, the null hypothesis is not rejected.

Keywords: Sensory Evaluation, Acceptability, Turmeric Polvoron

I. INTRODUCTION

Sensory evaluation has been defined as a scientific discipline used to evoke, measure, analyze, and interpret human reactions to meat sensory characteristics as perceived by sight, smell, taste, touch, and hearing by the Institute of Food Technologists (IFT) (https://www.sciencedirect.com, retrieved 3/15/2022).

Food acceptability is affected by many factors, which may be related to the individual, the food, or the environment in which the food is consumed. Acceptability is a subjective measure based on hedonics (pleasure), which in turn is influenced by the sensory properties of the food, previous exposure to it and subsequent expectations, contextual factors, an individual's culture, physiological status (i.e., hunger, thirst, and presence/absence of illness), and many other variables. The measurement of food acceptance is highly complex and relies on psychometrics (scales) and/or behavioral models (food-choice models). This article aims to discuss some innate factors that impact on foods' sensory acceptability and how these can be measured and understood using sensory evaluation.

Turmeric is a common spice that comes from the root of Curcuma longa. It contains a chemical called curcumin, which might reduce swelling. Turmeric has a warm, bitter taste and is frequently used to flavor or color curry powders, mustards, butters, and cheeses. Because curcumin and other chemicals in turmeric might decrease swelling, it is often used to treat conditions that involve pain and inflammation(https://www.webmd.com, retrieved 3/15/22).

Turmeric and especially its most active compound, curcumin have many scientifically proven health benefits, such as the potential to improve heart health and prevent against Alzheimer's and cancer. It's a potent anti-inflammatory and antioxidant. It may also help improve symptoms of depression and arthritis (https://www.healthline.com, retrieved 3/15/22).

Hence, the researcher developed interest in preparing food like Turmeric polvoron as a dessert that appeals to the taste of consumers.

II. Statement of the Problem:

This study aimed to determine the acceptability of Polvoron with Turmeric Powder.
Specifically, this study sought to answer the following questions:

1. What is the level of acceptability of turmeric powder mixed in Polvoron of 20 grams, 40 grams, and 60 grams proportions as evaluated by the respondents as to appearance, taste, texture, and aroma, and general acceptability?
2. Is there a significant difference in the acceptability of 20 grams, 40 grams, and 60 grams proportions of turmeric powder when evaluated by the respondents as to appearance, taste, texture, aroma, and general acceptability?

III. Hypothesis:

There is no significant difference in the acceptability of 20 grams, 40 grams, and 60 grams proportions of turmeric powder when evaluated by the respondents as to appearance, taste, texture, aroma, and general acceptability.

IV. METHOLOGY:

a. Research Design

The descriptive survey method of research was employed in this study. According to Travers (2005), descriptive research design is a method for the investigator to gather information about existing conditions. It aims to describe the nature of the situation as it exists at the time of the study and to explore the causes of phenomena.

These research designs were appropriate for this study on the level of acceptability of polvoron mixed with 20 grams, 40 grams, and 60 grams of turmeric powder as to appearance, aroma, taste, texture, and general acceptability.

b. Locale/Study Site

This study was conducted at Iloilo State College of Fisheries, Tiwi, Barotac Nuevo, Iloilo.

c. Procedure

Before conducting the study, the researcher seeks approval from the president of SUC. Upon approval, the researcher conducted the study. The adopted sensory evaluation checklist is used as an instrument in this study. The researcher cooked the product in different proportions. The product was tested by the respondents using sensory evaluation. The data was collected, tallied, and analyzed.

d. Data Analysis

The data was tallied, analyzed, and interpreted using the Statistical Package for Social Sciences software program (SPSS). Mean was used to determine the level of acceptability of 20 grams, 40 grams, and 60 grams of turmeric powder as to appearance, texture, flavor, aroma, and general acceptability. Analysis of Variance (ANOVA) was used to determine the difference in the level of acceptability between variables.

V. Results

Level of Acceptability as Evaluated by the Respondents in terms of Appearance, Aroma, Texture, Taste, and General Acceptability as to 20, grams, 40 grams, and 60 grams of Turmeric Polvoron

Table 1: Level of acceptability as evaluated by the respondents in terms of appearance, aroma, texture, taste, and general acceptability in 20 grams turmeric powder .

Variables	**Mean**	**Interpretation**
Appearance		
Student	4.0	Highly acceptable
Faculty and Staff	3.9	Highly acceptable
Aroma		
Student	4.0	Highly acceptable
Faculty and Staff	4.1	Extremely acceptable
Texture		
Student	4.4	Extremely acceptable
Faculty and Staff	4.3	Extremely acceptable
Taste		
Student	4.3	Extremely acceptable
Faculty and Staff	4.2	Extremely acceptable
General Acceptability		
Student	4.4	Extremely acceptable
Faculty and Staff	4.3	Extremely acceptable

Legend:

Range	Description
4.21-5.00	Extremely Acceptable
3.41-4.20	Highly Acceptable
2.61-3.40	Moderately Acceptable
1.81-2.60	Slightly Acceptable
1.00-1.80	Not Acceptable

Table 1 shows the level of acceptability of polvoron mixed with turmeric powder as evaluated by the respondents in terms of appearance, aroma, texture, taste, and general acceptability. As to 20 grams of turmeric powder, in terms of appearance, both students, faculty, and staff evaluated the product as "highly acceptable". In terms of aroma, the students evaluated the product as "Highly acceptable," while the faculty and staff evaluated the product as "extremely acceptable." In terms of texture, taste, and general acceptability, both students and faculty and staff evaluated the product as "extremely acceptable."

Table 2: Level of acceptability as evaluated by the respondents in terms of appearance, aroma, texture, taste, and general acceptability in 40 grams turmeric powder

Variables	**Mean**	**Interpretation**
Appearance		
Student	4.0	Highly acceptable
Faculty and Staff	4.1	Extremely acceptable
Aroma		
Student	4.2	Extremely acceptable
Faculty and Staff	4.2	Extremely acceptable
Texture		
Student	4.6	Extremely acceptable
Faculty and Staff	4.6	Extremely acceptable
Taste		
Student	4.6	Extremely acceptable
Faculty and Staff	4.3	Extremely acceptable
General Acceptability		
Student	4.6	Extremely acceptable
Faculty and Staff	4.4	Extremely acceptable

Legend:

Range	Description
4.21-5.00	Extremely Acceptable
3.41-4.20	Highly Acceptable
2.61-3.40	Moderately Acceptable
1.81-2.60	Slightly Acceptable
1.00-1.80	Not Acceptable

Table 2 shows the level of acceptability of polvoron mixed with turmeric powder as evaluated by the respondents in terms of appearance, aroma, texture, taste, and general acceptability. As to 40 grams of turmeric powder, in terms of appearance, students evaluated the product as "extremely acceptable," while faculty and staff evaluated the product as "extremely acceptable." In terms of aroma, texture, taste, and general acceptability, both students, faculty, and staff evaluated the product as "extremely acceptable." This supports the study of Tucar, M. (2017) entitled Sensory Characterization of Cupcakes Made of Sweet Potato (Ipomoea batatas) Flour with Turmeric (Curcuma longa) Powder. Regarding taste proportion, A (sweet potato cupcakes with 5 grams of turmeric powder) obtained the highest mean, which means very acceptable. In terms of texture, Proportion A (sweet potato cupcakes with 5 grams of turmeric powder) obtained the highest mean, which means very acceptable. In terms of aroma, cupcakes with 5 grams of turmeric powder (Product A=5.74) were described as "very much liked".

Table 3: Level of Acceptability as evaluated by the respondents in terms of appearance, aroma, texture, taste, and general acceptability in 60 grams turmeric powder

Variables	**Mean**	**Interpretation**
Appearance		
Student	4.0	Highly acceptable
Faculty and Staff	4.1	Extremely acceptable
Aroma		
Student	4.1	Extremely acceptable
Faculty and Staff	4.3	Extremely acceptable
Texture		
Student	4.3	Extremely acceptable
Faculty and Staff	4.4	Extremely acceptable
Taste		
Student	4.3	Extremely acceptable

Faculty and Staff	4.3	Extremely acceptable
General Acceptability		
Student	4.4	Extremely acceptable
Faculty and Staff	4.4	Extremely acceptable

Legend:

Range	Description
4.21-5.00	Extremely Acceptable
3.41-4.20	Highly Acceptable
2.61-3.40	Moderately Acceptable
1.81-2.60	Slightly Acceptable
1.00-1.80	Not Acceptable

Table 3 shows the level of acceptability of polvoron mixed with turmeric powder as evaluated by the respondents in terms of appearance, aroma, texture, taste, and general acceptability. As to 60 grams of turmeric powder, in terms of appearance, students evaluated the product as "highly acceptable," while faculty and staff evaluated the product as "extremely acceptable." In terms of aroma, texture, taste, and general acceptability, both students and faculty, and staff evaluated the product as "extremely acceptable."

Significant Difference as Evaluated by the Respondents in Terms of Appearance, Aroma, Texture, Taste, and General Acceptability as to 20, grams, 40 grams, and 60 grams of Turmeric Polvoron

Table 4: A significant difference in acceptability Turmeric polvoron in terms of General acceptability of 20 grams, 40 grams, and 60 grams proportion

Variables		**Sum of squares**	**Df**	**Mean square**	**F**	**Sig.**
20 grams	Between groups	.223	1	.223	.284	.595
	Within groups	86.339	110	.785		
	Total	86.562	111			
40 grams	Between groups	.437	1	.437	.748	.389
	Within groups	64.339	110	.585		
	Total	64.777	111			
60 grams	Between groups	.143	1	.143	.171	.680
	Within groups	91.821	110	.835		
	Total	91.964	111			

*p<.05

Table 4 shows that polvoron, with 20 grams, 40 grams, and 60 grams of turmeric powder obtained a p-value higher than the .05 alpha level of significance therefore, the null hypothesis is not rejected. This supports the study of Tucad, M. (2017). The result shows there was no significant difference in the level of acceptability of sweet potato cupcakes enriched with turmeric powder in terms of appearance and texture. Therefore, the hypothesis was accepted.

Table 5: Significant difference on acceptability of turmeric polvoron in terms of aroma of 20 grams, 40 grams, and 60 grams proportion

Variables		**Sum of squares**	**Df**	**Mean square**	**F**	**Sig.**
20 grams	Between groups	.080	1	.080	.108	.743
	Within groups	81.839	110	.744		
	Total	81.920	111			
40 grams	Between groups	.009	1	.009	.017	.896
	Within groups	57.441	110	.522		
	Total	57.420	111			
60 grams	Between groups	1.080	1	1.080	.1664	.200
	Within groups	71.411	110	.649		
	Total	72.491	111			

*p<.05

The table 5 shows that in terms of aroma as to 20 grams of turmeric polvoron, the p-value is .743, while for 40 grams of turmeric polvoron, the p-value of .896, and for 60 grams of turmeric polvoron, the p-value is .200. Therefore, the aroma among proportion is higher than .05 level of significance, thus the null hypothesis stating that there is no significant difference is not rejected.

Table 6: *Significant difference in acceptability turmeric polvoron in terms of texture of 20 grams, 40 grams, and 60 grams proportion*

Variables		Sum of squares	Df	Mean square	F	Sig.
20 grams	Between groups	.438	1	.438	.772	.382
	Within groups	62.339	110	.567		
	Total	62.777	111			
40 grams	Between groups	.000	1	.000	.000	1.000
	Within groups	59.000	110	.536		
	Total	59.000	111			
60 grams	Between groups	.438	1	.438	.733	.394
	Within groups	65.625	110	.597		
	Total	66.063	111			

*p<.05

Table 6 shows that in terms of texture as to 20 grams of turmeric polvoron, the p-value is .382, while for 40 grams of turmeric polvoron, the p-value is 1.000, and for 60 grams of turmeric polvoron, the p-value is .394. Therefore, the texture among proportion is higher than .05 level of significance, thus the null hypothesis stating that there is no significant difference is not rejected.

Table 7 : *Significant difference in acceptability of turmeric polvoron in terms of Taste of 20 grams, 40 grams, and 60 grams proportion*

Variables		Sum of squares	Df	Mean square	F	Sig.
20 grams	Between groups	.223	1	.223	.340	.561
	Within groups	72.196	110	.656		
	Total	72.420	111			
40 grams	Between groups	2.893	1	2.893	6.244*	.014
	Within groups	50.964	110	.463		
	Total	53.857	111			
60 grams	Between groups	.143	1	.143	.193	.662
	Within groups	81.536	110	.741		
	Total	81.679	111			

*p<.05

Table 7 shows that in terms of taste as to 20 grams of turmeric polvoron, the p-value is .561, while for 40 grams of turmeric polvoron, the p-value is .014, and 60 grams of turmeric polvoron, the p-value is .662. Therefore, the taste in proportions of 20 grams and 60 grams is lower than .05 alpha level of significance, thus the null hypothesis stating that there is significant difference is not rejected while as to taste in proportion of 40 grams is lower than .05 level of significance, thus the null hypotheses stating that there is no significant difference is rejected.

Table 8: *Significant difference in acceptability of turmeric polvoron in terms of general acceptability of 20 grams, 40 grams, and 60 grams proportion*

Variables		Sum of squares	Df	Mean square	F	Sig.
20 grams	Between groups	.438	1	.438	.801	.373
	Within groups	60.054	110	.546		
	Total	60.491	111			
40 grams	Between groups	1.286	1	1.286	3.165	.078
	Within groups	44.679	110	.406		
	Total	45.964	111			
60 grams	Between groups	.009	1	.009	.017	.896
	Within groups	57.268	110	.521		
	Total	57.227	111			

The table 8 shows that in terms of general acceptability as to 20 grams of turmeric polvoron, the p-value is .373, while in for 40 grams of turmeric polvoron, the p-value is .078, and for 60 grams of turmeric polvoron, the p-value is .896. Therefore, the general acceptability among proportions is higher than .05 alpha level of significance, thus the null hypothesis stating that there is no significant difference is not rejected.

Summary of Findings

The following are the findings of the study.

1. For 20 grams turmeric polvoron in terms of appearance, the students and faculty and staff evaluated the product as highly acceptable. In terms of aroma, the faculty and staff evaluated the product as extremely acceptable while the students evaluated the product as highly acceptable. In terms of texture and taste, the students and faculty and staff evaluated the product as extremely acceptable.
2. For 40 grams turmeric polvoron in terms of appearance, the faculty and staff evaluated the product as extremely acceptable while the students evaluated the product as highly acceptable. In terms of aroma, texture and taste, and general acceptability, the students and faculty and staff evaluated the product as extremely acceptable.
3. For 60 grams turmeric powder in terms of appearance, the students evaluated the product as highly acceptable, while the faculty and staff evaluated the product as extremely acceptable. In terms of aroma, texture, taste, and general acceptability, the students and faculty and staff evaluated the product as extremely acceptable.
4. The ANOVA results of the significant difference in acceptability of turmeric polvoron in terms of appearance of 20 grams, 40 grams, and 60 grams proportions show that there is no significant difference.
5. As to the acceptability as to aroma of 20 grams 40 grams and 60 grams of turmeric polvoron, there is no significant difference.
6. As to the level of acceptability as to texture of 20 grams 40 grams and 60 grams of turmeric polvoron, there is no significant difference.
7. As to level of acceptability as to taste of 20 grams and 60 of turmeric polvoron, there is no significant difference, while for 40 grams of turmeric polvoron, there is a significant difference.
8. As to level of acceptability as to general acceptability as to 20 grams, 40 grams and 60 grams of turmeric polvoron, there is no significant difference.

VI. Conclusions

Based on the findings, the following conclusions were drawn:

1. As to the level of acceptability in terms of appearance, aroma, texture, taste, and general acceptability, the polvoron with turmeric powder was evaluated as highly acceptable and extremely acceptable.
2. There is no significant difference in the acceptability of polvoron with turmeric powder for 20 grams and 60 grams in terms of appearance, aroma, texture, taste, and general acceptability. For 40 grams in terms of taste, there is a significant difference.

VII. Recommendations

Based on the findings and conclusions drawn, the following recommendations were offered:

1. The amount of turmeric powder, instead of 40 grams, 30 grams is more advisable for the improvement of the taste.

2. Future researchers may conduct further related studies on turmeric.

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