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Honey Onion Candy: Product Development

Jayson U. Bacos, Kim Billy M. Matildo, Joanna S. Urcales,
Hazel Princess M. Rebollo
College of Hospitality Education, University of Mindanao
Davao City, Davao Del Sur, Philippines
hrebollo@umindanao.edu.ph

ABSTRACT

ABSTRACT: This study explores the potential of honey onion candy in product development, focusing on its sensory acceptance and nutritional value. A survey was conducted with 399 University of Mindanao students, selected through convenience sampling. The results show high sensory acceptance of honey onion candy, with participants rating its color, consistency, texture, shape, and taste favorably. While the study did not include a detailed nutritional analysis, it is recommended that the product undergo testing by the Department of Science and Technology (DOST) to assess its nutritional content and validate any potential health claims.

Keywords: honey union candy, product development.

INTRODUCTION

Candy is a popular treat, especially in the Philippines, where both children and adults are known for their "sweet tooth." In fact, candy consumption in the Philippines has been substantial, with studies showing that Filipinos consume an average of 21 grams of candy daily (FDA, 1995). However, excessive consumption of traditional candies, which are often high in sugar and low in nutritional value, has been linked to various health concerns, including obesity, diabetes, and cardiovascular diseases (Agopitac, 2011). This highlights the need for the development of healthier alternatives that can satisfy the demand for sweet foods without contributing to negative health outcomes.

One promising alternative is honey onion candy, which combines the natural sweetness of honey with the medicinal properties of onions. Onions (Allium cepa) have long been recognized for their health benefits, including their antioxidant, anti-inflammatory, and immune-boosting effects (Kuete, 2017; Gateri et al., 2018). Onions are also known to improve heart health, lower cholesterol, and regulate blood sugar levels (Kubala, 2018). Honey, on the other hand, is rich in antioxidants and

has been used for its antibacterial and anti-inflammatory properties (Nordqvist, 2018). Together, these ingredients could offer a healthier candy option that provides both nutritional value and desirable sensory qualities, such as taste and texture, which are critical factors for consumer acceptance.

Despite these potential benefits, there is a limited body of research exploring the use of onions and honey in the candy industry. Most existing studies focus on the individual health benefits of these ingredients in their raw forms, rather than their combination into a functional candy product. Additionally, the market for healthier candy alternatives remains underdeveloped, particularly in countries like the Philippines, where sugary snacks dominate the market (Duyff et al., 2015). This study aims to fill this gap by exploring the potential of honey onion candy as a functional food product.

While honey and onions have demonstrated health benefits individually, research on their combined use in candy is scarce. Furthermore, most studies on candy consumption have focused on its negative effects on health, with little attention given to the possibility of creating healthier alternatives that also meet consumer expectations for taste and texture (Duyff et al., 2015; FDA, 1995). This study seeks to address this gap by evaluating the feasibility and acceptability of honey onion candy as a functional and nutritious alternative to traditional candies.

The primary objectives of this study are to evaluate the sensory acceptability of honey onion candy in terms of color, shape, consistency, taste, texture and overall general acceptability among a sample of University of Mindanao students. Determine if demographic factors such as gender, age, and educational attainment significantly influence the acceptability of the product.

This research is significant for several reasons. First, it explores the potential for creating a healthier candy alternative that could address the growing concerns around sugar consumption. Honey onion candy could provide a functional product that offers health benefits such as improved immunity, cardiovascular health, and blood sugar regulation while still satisfying the craving for sweets (Kuete, 2017; Kubala, 2018). Second, it contributes to the field of functional foods, which are gaining popularity as consumers seek healthier food options that provide additional benefits beyond basic nutrition (McGonigal, 2010). Lastly, this study could encourage local manufacturers to develop and market healthier candy products, creating new business opportunities while improving public health outcomes.

METHOD

This study employed an experimental research design to systematically evaluate the development of a honey-onion candy product. According to Bhat (2020), experimental research involves the manipulation of one or more variables while controlling and measuring changes in other variables. This approach was used to assess the characteristics of honey-onion candy specifically focusing on the following attributes: color, shape, consistency, taste, and overall acceptability.

The respondents for this study include students from the Colleges, Senior High School, High School, and Elementary students at the University of Mindanao. Additionally, employees from the City Hall of Davao were included as part of the

respondent pool. Random Sampling was employed to select participants, ensuring a diverse representation of the university and city hall populations.

A survey questionnaire was developed and administered to gather data on the acceptability of the honey-onion candy product. The questionnaire was carefully validated by subject matter experts to ensure its reliability and relevance to the research questions. The goal was to assess how the developed honey-onion candy was perceived by the respondents in terms of various sensory attributes, such as color, shape, consistency, taste, texture, and overall acceptability. The participants rated the candy using a 9-point scale, where 9 indicated excellent (representing perfect color, aroma, consistency, and taste), and 1 indicated inedible (representing a product with unacceptable characteristics). A rating of 5 was considered borderline, indicating a product with acceptable but unimpressive characteristics, and any ratings above this would signify various levels of acceptability from fair to excellent.

The survey results were analyzed to determine the overall acceptability of the honey-onion candy and identify any significant differences in perceptions based on demographic factors such as gender, age, and educational attainment. The respondents for the study were 399 individuals consisting primarily of male high school students aged 11-16. The data gathered from these respondents will provide insights into the acceptability of the honey-onion candy across different demographic groups.

This study employed experiment plan research. The experimental diagram is a systematic and scientific approach to research in which the researcher manipulates one or greater variables and controls and measures any exchange in other variables (Bhat, 2020). It is on this premise that the experimental approach considering this to find out about the aimed to develop the healthful usage of honey and onion.

Table 1. Respondent Profile

Profile Variables	Group	Frequency	Percent
Sex	Male	233	58.4
	Female	166	41.6
Educational Attainment	Elementary	70	17.5
	High School	130	32.6
	College	105	26.3
	Others	94	23.6
Age	6-10	61	15.3
	11-16	139	34.8
	17-25	135	33.8
	26 above	64	16.0

Research Procedure

The following diagram shows the procedure employed in conducting the study:

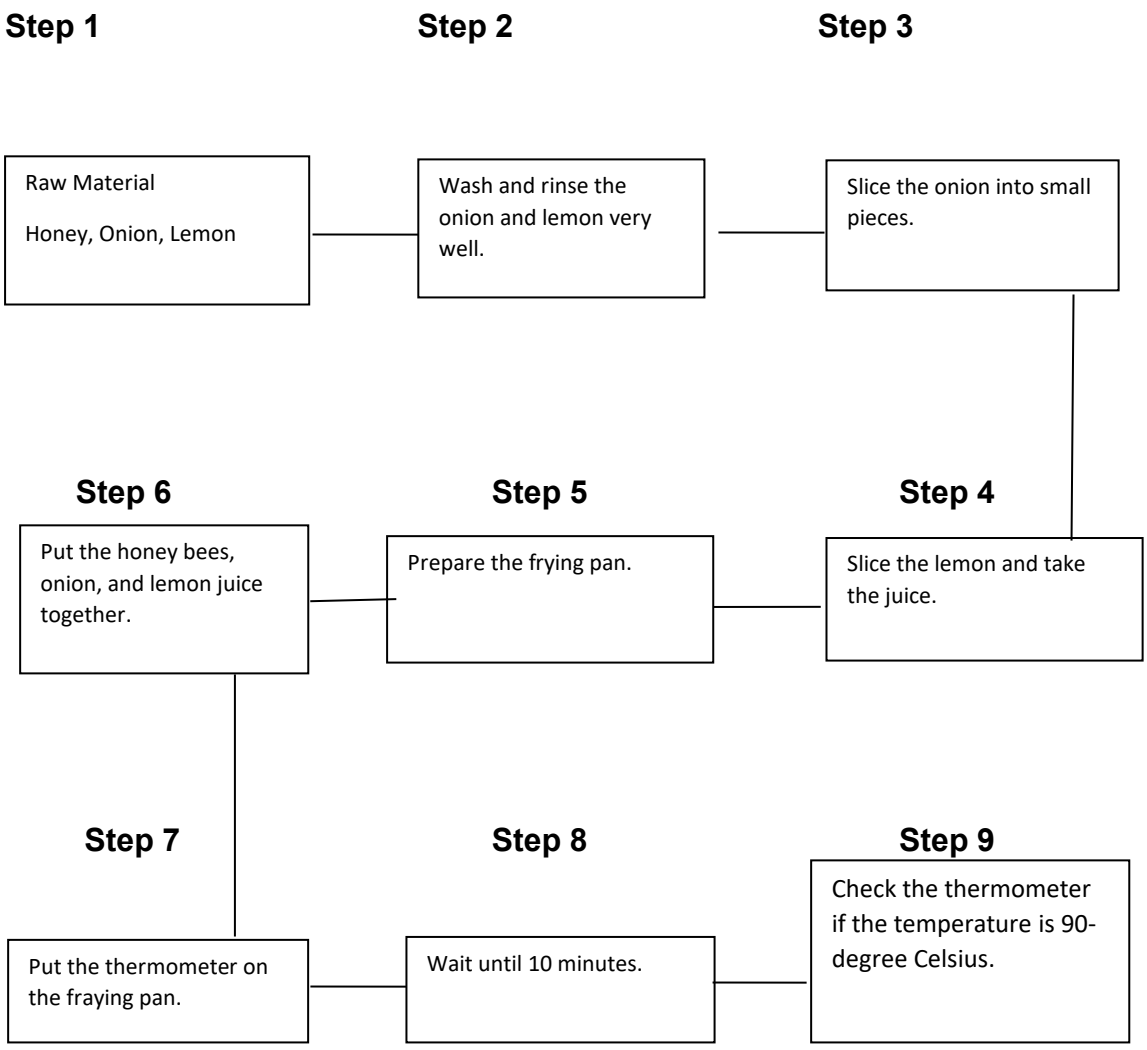

Figure 1: Flow Chart for Honey Onion Candy

The researcher developed four different variations of honey onion candy to establish control measures for the study. Among these four formulations, the honey

onion candy with lemon was found to be the most acceptable, based on sensory evaluation by the respondents.

For data analysis, several statistical tools were employed. The mean was used to determine the overall level of acceptability of the honey onion candy products based on the sensory evaluations. To assess the significant differences among the various candy samples, an Analysis of Variance (ANOVA) was conducted, focusing on their sensory attributes. Additionally, a T-test was applied to evaluate the significant differences between the control product and the most preferred honey onion candy sample in terms of external attributes. All statistical tests were conducted using a 5% level of significance to ensure the reliability and validity of the results.

RESULTS AND DISCUSSION

Honey Onion Candy: Product Development

Table 2 presents the acceptability ratings of the honey onion candy product development, which was generally rated as "good" by the respondents. The overall mean rating of 7.29 (SD = 0.982) reflects this positive assessment. The individual attributes—color, shape, consistency, taste, texture, and general acceptability—were also rated as "good," indicating that the product aligns with the preferences of the respondents. Overall, the honey onion candy is considered acceptable to the public, with its characteristics meeting their expectations.

Specifically, the color of the honey onion candy received the highest rating, with a mean score of 7.41, categorized as "good." Respondents expressed a preference for the candy's color, which is a brown hue resulting from its key ingredients—honey, lemon, and onion. The color change occurs due to the caramelization of honey when exposed to heat, giving the product a brown and sticky texture. These findings suggest that the color of the candy plays a significant role in influencing the respondents' perception and acceptance of its taste.

The shape of the honey onion candy was rated the lowest among all the sensory attributes, with a mean score of 7.17, which is still described as "good." While the respondents expressed interest in consuming the honey onion candy, the shape of the product was considered the least favorable aspect. According to Silayoi and Speece (2017), packaging is a key element in shaping the public's perception of a product. Effective packaging communicates the quality of the product, which could be a factor influencing respondents' rating of the shape.

Table 2. Sensory Evaluation of Honey Onion Candy

Indicators	Mean	Std. Deviation	Descriptive Interpretation
Color	7.41	1.108	Good
General Acceptability	7.36	1.010	Good
Consistency	7.34	1.123	Good
Texture	7.25	1.238	Good
Taste	7.21	1.269	Good
Shape	7.17	1.138	Good
Overall	**7.29**	**0.982**	**Good**

In contrast, the consistency of the honey onion candy was rated the third highest feature, with a mean score of 7.34. This suggests that respondents appreciated the product's thickness, which plays an important role in their decision to consume the candy. Consistency is vital not only for maintaining a uniform taste during consumption but also for meeting consumer expectations. As Szymanski and Hendard (2001) emphasize, consumers value reliability, sustainability, and durability in a product. If the product consistently meets or exceeds their expectations, it can lead to higher satisfaction and positive outcomes.

The taste of the honey onion candy received a mean rating of 7.21, indicating it was the fifth-highest rated attribute but still considered "good." This implies that respondents enjoyed the flavor of the candy, which is a crucial factor in product acceptance. As Serhiiko (2023) highlights, taste is a fundamental element that influences consumer preference, as it directly affects the sensory experience and pleasure derived from a food product.

The texture of the honey onion candy was rated the fourth-highest attribute, with a mean score of 7.25, also described as "good." This indicates that respondents favored the candy's texture, suggesting that when the texture aligns with consumer preferences, it enhances their desire to consume the product. Rosenthal (2015) supports this view, noting that the texture of food is a collective sensory experience involving sight, sound, and touch. The texture can significantly influence a consumer's overall liking and willingness to purchase a product, as individual perceptions of texture can vary widely across different foods.

Finally, the general acceptability of the honey onion candy was rated the second-highest attribute, with a mean score of 7.36, also described as "good." This finding suggests that respondents favored the overall quality and appeal of the candy, which is a key driver of consumer purchase behavior. When a product is generally accepted by a large portion of the population, it can encourage further consumption. Murray (2003) suggests that food acceptability is influenced by multiple factors, including individual preferences, the product itself, and the environmental context in which it is consumed.

Significance of Acceptability in Honey Onion Candy: Product Development Analyzed by Sex

Table 3 presents the results of the acceptability analysis of the honey onion candy product development, categorized by sex. The findings indicate that there is no significant difference in the acceptability of the product between male and female respondents. The p-values for all sensory indicators—color (0.818), shape (0.512), consistency (0.652), taste (0.987), and texture (0.528)—are all greater than the 0.05 level of significance, suggesting that the differences observed are not statistically significant.

As a result, the null hypothesis is accepted, indicating that there is no substantial variation in how male and female respondents perceive the honey onion candy. Both groups appear to assess the product based on similar sensory criteria, with no significant difference in their preferences or perceptions. These findings imply that the honey onion candy is generally perceived the same way by both male and female respondents, indicating that sensory attributes such as taste, texture, and appearance are evaluated similarly across genders.

This suggests that the acceptability of the honey onion candy product development is not influenced by the sex of the respondents, meaning that this candy variety is equally likely to be well-received by individuals regardless of gender

Table 3. Significance of Acceptability in Honey Onion Candy: Product Development Analyzed by Sex

	Group	N	Mean	Std. Deviation	t-value	p-value
Color	Male	233	7.40	1.122	0.231	0.818
	Female	166	7.43	1.092		
Shape	Male	233	7.20	.960	0.657	0.512
	Female	166	7.13	1.078		
Consistency	Male	233	7.36	1.098	0.452	0.652
	Female	166	7.31	1.159		
Taste	Male	233	7.21	1.210	0.016	0.987
	Female	166	7.21	1.279		
Texture	Male	233	7.21	1.317	0.798	0.425
	Female	166	7.31	1.200		
General Acceptability	Male	233	7.33	1.180	0.632	0.528
	Female	166	7.40	1.078		
Overall	**Male**	**233**	**7.28**	**.993**	**0.135**	**0.893**
	Female	**166**	**7.30**	**.970**		

*p<0.05

Significant Difference in the Acceptability of Honey Onion Candy: Product Development by Age

Table 4 presents the results of the analysis of variance (ANOVA) examining the acceptability of honey onion candy product development by age. The findings indicate that there is a significant difference in the perception of the product based on age, as evidenced by p-values for all sensory indicators—color (0.000), shape (0.000), consistency (0.000), taste (0.000), and texture (0.000)—which are all less than the 0.05 level of significance.

Given these results, the null hypothesis is rejected, meaning there is a statistically significant difference in how the product is perceived across different age groups. This suggests that age may play a role in influencing the acceptability of the honey onion candy, as respondents from different age brackets may have varying preferences or sensory experiences with the product.

Table 4. Significant Difference in the Acceptability of Honey Onion Candy: Product Development by Age

		Sum of Squares	Df	Mean Square	F	Sig.
Color	Between Groups	151.114	3	50.371	58.868	0.000*
	Within Groups	337.988	395	.856		
	Total	489.103	398			
Shape	Between Groups	83.507	3	27.836	34.056	0.000*
	Within Groups	322.859	395	.817		
	Total	406.366	398			
Consistency	Between Groups	127.046	3	42.349	44.617	0.000*
	Within Groups	374.914	395	.949		
	Total	501.960	398			
Taste	Between Groups	171.714	3	57.238	51.581	0.000*
	Within Groups	438.316	395	1.110		
	Total	610.030	398			
Texture	Between Groups	222.847	3	74.282	70.097	0.000*
	Within Groups	418.587	395	1.060		
	Total	641.434	398			
General Acceptability	Between Groups	205.616	3	68.539	87.215	0.000*
	Within Groups	310.414	395	.786		
	Total	516.030	398			
Overall	**Between Groups**	**153.842**	**3**	**51.281**	**87.878**	**0.000***
	Within Groups	**230.498**	**395**	**.584**		
	Total	**384.340**	**398**			

The acceptability of the honey onion candy product development, as analyzed by age, indicates that both younger and older respondents exhibit varying levels of perception and preference toward the product. This suggests that different age groups perceive the honey onion candy, as well as other candy products, differently. Younger respondents may be more inclined to seek unique or novel qualities in products, while older individuals may prioritize traditional or familiar characteristics. This age-related difference in perception is supported by Miller (2014), who asserts that the way individuals perceive products and experiences evolves with age. Thus, younger individuals often have distinct preferences compared to older generations, influencing how they evaluate new or innovative products.

Significant Acceptability of Honey Onion Candy: Product Development Analyzed by Educational Attainment

Table 5 presents the results of the analysis of the significant acceptability of the honey onion candy product development based on educational attainment. The findings show substantial evidence of differences in the acceptability of the product when analyzed according to the respondents' educational level. P-values for all indicators—such as color (0.000), shape (0.000), consistency (0.000), taste (0.000), and texture (0.000)—are all below the 0.05 level of significance, indicating that educational attainment influences how respondents perceive the product. Therefore, the null hypothesis is rejected, confirming that there is a significant variation in the acceptability of the honey onion candy based on respondents' educational background.

Table 5. Significant Acceptability of Honey Onion Candy: Product Development Analyzed by Educational Attainment

		Sum of Squares	Df	Mean Square	F	Sig.
Color	Between Groups	181.807	3	60.602	77.899	0.000*
	Within Groups	307.295	395	.778		
	Total	489.103	398			
Shape	Between Groups	87.637	3	29.212	36.203	0.000*
	Within Groups	318.729	395	.807		
	Total	406.366	398			
Consistency	Between Groups	144.287	3	48.096	53.115	0.000*
	Within Groups	357.673	395	.906		
	Total	501.960	398			
Taste	Between Groups	173.021	3	57.674	52.130	0.000*
	Within Groups	437.009	395	1.106		
	Total	610.030	398			
Texture	Between Groups	230.136	3	76.712	73.672	0.000*
	Within Groups	411.298	395	1.041		
	Total	641.434	398			
General Acceptability	Between Groups	219.758	3	73.253	97.663	0.000*
	Within Groups	296.272	395	.750		
	Total	516.030	398			
Overall	**Between Groups**	**164.341**	**3**	**54.780**	**98.356**	**0.000***
	Within Groups	**219.999**	**395**	**.557**		
	Total	**384.340**	**398**			

This suggests that respondents from various educational backgrounds elementary, high school, college of engineering, and city hall employees demonstrated a positive level of acceptability toward the honey onion candy product development. It implies that the perception and acceptance of the honey onion

candy, or any other candy product, may vary depending on educational attainment. This finding aligns with the work of Deary and Johnson (2010), who argued that individuals with higher levels of education are more likely to shape their perceptions based on their extended schooling. Their research suggests that intelligence and education are closely intertwined, with both having direct and indirect effects on how individuals perceive and evaluate products.

CONCLUSION AND RECOMMENDATIONS

Based on the findings presented in the study, the Honey Onion Candy has shown potential as a viable product for both entrepreneurs and consumers, particularly children. The product's acceptability was assessed across several attributes, including color, shape, consistency, taste, texture, and general acceptability. The results indicated that the honey onion candy was generally well-received, with an overall mean rating of 7.29, which corresponds to a "good" level of acceptability. Among the product's attributes, color (mean = 7.41) received the highest rating, suggesting that the visual appeal of the candy plays a significant role in consumer preference. Consistency (mean = 7.34) and texture (mean = 7.25) also ranked highly, emphasizing the importa

nce of product quality and the sensory experience in driving acceptability.

However, while the product was generally well-accepted, certain attributes like shape (mean = 7.17) and taste (mean = 7.21) were rated slightly lower, suggesting areas for improvement. The product's overall acceptability did not significantly differ between male and female respondents, indicating that the candy appeals to a wide demographic regardless of sex. In terms of age, however, significant differences in acceptability were observed, with younger respondents (children and adolescents) tending to rate the product more favorably, which could be attributed to a preference for novel, sweet-tasting candies. Similarly, educational attainment showed significant differences, with respondents of varying educational backgrounds perceiving the product differently. This reinforces the idea that perceptions and preferences can be influenced by demographic factors such as age and education level.

Furthermore, the study suggested that the honey-onion mixture used in the candy may offer additional health benefits, especially in terms of its potential antimicrobial properties, which adds an appealing health-conscious aspect to the product.

Based on the data and findings, several recommendations are proposed to improve the product and its marketability:

1. Packaging Improvements. To ensure better product preservation and appeal, the packaging of Honey Onion Candy should be redesigned. A double-layer packaging approach is recommended to enhance freshness and prevent contamination. Additionally, including nutritional information on the packaging

will increase consumer trust, particularly those seeking healthy, transparent food options.

2. Testing and Quality Control. It is essential for the Honey Onion Candy to undergo laboratory testing to assess the safety and efficacy of the ingredients, especially the honey-onion mixture. Conducting microbial and shelf-life tests will ensure that the candy is safe for consumption and meets food safety standards.

3. Marketing Strategy. The study showed that age and educational attainment had a significant impact on how the candy was perceived. Targeted marketing campaigns should be developed to address specific demographic groups. For instance, younger audiences, such as children and adolescents, seem more receptive to the candy's flavor and novelty, so marketing materials could focus on the candy's sweetness and health benefits. Meanwhile, adults, especially those with higher educational attainment, may be more interested in the product's health benefits and natural ingredients. Highlighting the antimicrobial properties of the honey-onion mixture and positioning the product as a healthier alternative to traditional candies could attract health-conscious consumers.

4. Product Development. Although the shape and taste received slightly lower ratings, these areas can be improved through further product development. Experimenting with different formulations or refining the taste to better match consumer preferences could enhance the overall acceptability. A more attractive or innovative shape could also be explored to increase visual appeal, particularly among younger consumers.

In conclusion, by focusing on enhancing packaging, conducting thorough testing, targeting specific consumer groups, and refining the product's characteristics, Honey Onion Candy has the potential to be a competitive and marketable product in the confectionery industry. Ensuring consistency in product quality and meeting the diverse preferences of different consumer groups will be key to its success.

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