

Development and acceptability of golden apple snail (*pomacea canaliculata*) flavored *chicharon*

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Abstract: This study aims to develop and assess the acceptability of golden apple snail (*pomacea canaliculata*) flavored *chicharon* in three variants: unflavored, garlic-flavored, and cheese-flavored. Following a detailed developmental procedure, sensory evaluation was conducted with 120 participants comprising children, teenagers, adults, and food experts. The cheese-flavored variant came out as the most highly acceptable across all groups. Nutritional analysis indicated that the snail *chicharon* is a high-protein, moderate-fat snack with lower total calories than traditional pork *chicharon*, presenting a healthier alternative. Shelf-life assessment showed the product maintained quality for up to one week at room temperature. Recommendations include optimizing packaging to extend shelf life, implementing targeted marketing strategies, clear nutritional labeling, exploring additional flavors, and providing clear storage instructions. Overall, golden apple snail flavored *chicharon* demonstrates significant potential for commercial viability as a nutritious and innovative snack.

Keywords: Golden apple snail, Chicharon, Sensory evaluation, Nutritional analysis, Commercial viability

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INTRODUCTION

The Philippines is renowned for its rich variety of snacks, many of which are enjoyed by locals in communal settings such as street corners and markets. This vibrant food culture highlights the creativity and culinary innovation of Filipinos. The widespread use of social media has further amplified this creativity, showcasing unique dishes that capture the attention of netizens across the globe (Nielsen, 2015; Adriano, 2019).

Chicharon, or chicharrón, is one of the most beloved snacks in the Philippines. It is traditionally made from dried pork rinds, pork scratching, or pig skin, and is commonly enjoyed as pulutan (finger food) alongside alcoholic beverages, or as a topping for native vegetable and noodle dishes (Gonzalez, 2012; Santos, 2018). The snack is ubiquitous, available from supermarket chains to sari-sari stores and street vendors (Fernandez, 2016).

Filipinos have a penchant for snacks dipped in vinegar, a practice that complements the crispy and savory qualities of chicharon. Over the years, various flavors and types of chicharon have emerged, catering to different tastes and preferences. The introduction of golden apple snail-flavored chicharon represents an innovative twist on this traditional snack, offering a texture and taste reminiscent of regular pork belly chicharon. This new variant not only serves as an alternative pulutan for alcohol enthusiasts but also provides a healthier, crunchier snack option for children who frequently consume junk food (Martinez, 2020).

As an agricultural country, the Philippines benefits from a diverse range of food sources. While pigs' skin and belly are staples, there is potential to explore other locally available resources. One such resource is the golden apple snail (*Pomacea canaliculata*), which is often considered a pest due to its invasive nature and its capacity to cause significant damage to rice crops. Unchecked, these snails can destroy entire sections of rice fields overnight, leading to substantial yield losses (Siregar & Lubis, 2017; Aquino, 1993).

Despite being labeled a pest, the golden apple snail has culinary potential, particularly in the northern regions of the Philippines where it is prepared in dishes like ginataang kuhol and adobong kuhol. In Isabela, the snail is readily available and has long been part of the local cuisine (Vongvichitch, 2006; Dela Cruz, 2002). This study aims to transform the pest into a profitable and nutritious food product that can benefit the community, especially farmers who can turn this nuisance into a source of income.

While existing literature points to the potential use of snails as fertilizer (Siregar & Lubis, 2017; Aquino, 1993) and a protein-rich food source (Catalma et al., 1991; Dela Cruz, 2002; Vongvichitch, 2006), there is a notable gap in research regarding their viability as a chicharon ingredient. This study seeks to fill that gap by exploring the development and market acceptability of golden apple snail-flavored chicharon, an innovative and healthy food product that promises to benefit both consumers and the farming community.

The researcher is motivated and challenged to introduce this novel snack, offering a new way to enjoy chicharon while addressing the pest problem in rice fields. The development of golden apple snail-flavored chicharon not only showcases Filipino ingenuity but also provides a potential economic boost for local farmers and the wider community.

Statement of the problem

This study aimed to find the acceptability of golden apple snail-flavored *chicharon*. Specifically, it sought to answer the following questions;

- 1) What is the process of making golden apple snail-flavored *chicharon*?
- 2) What is the respondents' sensorial evaluation of golden apple snail-flavored *chicharon* in the following samples: unflavored, garlic powder flavored, and cheese powder flavored?
- 3) What is the level of acceptability of golden apple snail-flavored *chicharon* in terms of: appearance/color; aroma; taste; and texture?
- 4) Is there a significant difference in the level of acceptability of snail *chicharon* flavored with cheese powder, garlic powder, and unflavored as perceived by the respondents?
- 5) What is the nutritive value of golden apple snail-flavored *chicharon*?
- 6) What is the shelf life of golden apple snail-flavored *chicharon*?

METHODOLOGY

Research design

The study follows a developmental research design aimed at creating and evaluating the acceptability of golden apple snail-flavored chicharon. The process includes developing the product in three variants (unflavored, garlic-flavored, and cheese-flavored), conducting sensory evaluations, and analyzing nutritional content. The acceptability of the chicharon was assessed based on appearance, aroma, taste, and texture through sensory evaluations by different groups of respondents.

Locale of the study and respondents

The study was conducted in the City of Ilagan, Isabela, Philippines. The respondents included 120 participants, categorized into four groups: 30 children (7-12 years old), 30 teenagers (13-18 years old), 30 adults (19 years and above), 30 food experts. These participants were randomly selected from Bagumbayan, the City of Ilagan, Isabela, including students and faculty staff of Isabela National High School and food technology teachers from Isabela School of Arts and Trades.

Research instruments

The primary instrument used for data gathering was a modified questionnaire checklist based on a tool from a previous study by Prof. Catherine M. Aggabao of Isabela State University-Ilagan Campus. The questionnaire included criteria for evaluating the acceptability of the golden apple snail-flavored chicharon in terms of appearance, aroma, taste, and texture. The evaluation used a five-point Likert scale to measure acceptability. Additionally, an observation method was applied to assess changes in the sensory attributes of the chicharon.

Data analyses procedure

The data analysis for this study involved several critical steps to ensure a thorough evaluation of the golden apple snail-flavored chicharon. Initially, sensory evaluations were conducted, and the collected data were decoded and subjected to statistical analysis. The responses regarding the level of acceptability were rated using a five-point Likert scale, with scores ranging from 1 (Not Acceptable) to 5 (Highly Acceptable). Mean scores for each sensory attribute, including appearance, aroma, taste, and texture, were calculated for each variant of the chicharon: unflavored, garlic-flavored, and cheese-flavored. The overall acceptability was then determined by computing the grand mean of these scores.

To compare the level of acceptability among the different groups of respondents, F-tests and post hoc analyses were employed to identify significant differences. Additionally, the nutritional content of the golden apple snail chicharon was analyzed and reported, providing detailed insights into its protein, fat, moisture, sodium, and caloric content. This comprehensive data analysis approach ensured a robust assessment of the product's sensory qualities and nutritional value, enabling an informed evaluation of its overall acceptability.

FINDINGS AND DISCUSSION

Level of acceptability of the golden apple snail-flavored chicharon in terms of appearance, aroma, taste, and texture among different respondent groups

The sensory evaluation showed that the cheese-flavored snail *chicharon* was highly acceptable in terms of appearance/color, taste, and texture, with mean scores of 4.58, 4.59, and 4.71, respectively. Its aroma was moderately acceptable, with a mean of 4.38, resulting in an overall high acceptability with a grand mean of 4.56. The garlic-flavored variant also received moderately acceptable ratings for appearance/color and aroma, with scores of 4.44 and 4.35, respectively. However, it was highly acceptable in terms of taste and texture, with scores of 4.33 and 4.68, respectively, leading to a grand mean of 4.44. The unflavored variant was moderately acceptable in all criteria except for texture, where it scored 4.67, resulting in a grand mean of 4.36

Significant differences in the acceptability of the golden apple snail-flavored chicharon among different age groups and between adults and children

The level of acceptability among different respondent groups varied significantly. The F-test results indicated significant differences in the acceptability of the unflavored and garlic-flavored variants, particularly between children and adults, with adults and food experts showing higher acceptability than children. This trend aligns with previous research indicating that adults generally prefer flavors with lower salt concentrations compared to children.

The findings suggest that the golden apple snail *chicharon*, particularly the cheese-flavored variant, has significant potential for commercial viability due to its high acceptability and favorable nutritional profile. The variation in acceptability among different age groups highlights the importance of targeted marketing strategies to cater to specific consumer preferences. For instance, marketing the cheese-flavored variant to younger consumers while emphasizing the nutritional benefits of the garlic-flavored and unflavored variants to adults and food experts could enhance market reach

Nutritional contents of the golden apple snail-flavored chicharon in terms of protein, fat, carbohydrates, and total caloric content

The nutritional analysis conducted by the Department of Science and Technology (DOST) revealed that the golden apple snail *chicharon* is a high-protein, moderate-fat snack with a total caloric content of 417.84 kcal per 100 grams. The snack's nutritional composition includes 51.68% protein, 19.16% crude fat, and 9.67% carbohydrates, making it a healthier alternative to traditional pork *chicharon*.

The nutritional benefits of the golden apple snail *chicharon* position it as a healthier alternative to traditional pork *chicharon*, potentially attracting health-conscious consumers. The high protein content, moderate fat levels, and lower total caloric content make it suitable for individuals seeking nutritious snack options

Shelf life of the golden apple snail-flavored chicharon and quality change over time at room temperature

The shelf-life assessment indicated that the golden apple snail *chicharon* maintained its quality for up to one week at room temperature. However, noticeable degradation in texture and appearance was observed by the fourth week, with signs of spoilage, including mold growth, by the fifth week.

This finding posits that the shelf-life assessment underscores the need for optimized packaging solutions to extend the product's shelf life and maintain its quality over time. Advanced packaging techniques that preserve the snack's crispiness and appearance could significantly enhance its marketability

CONCLUSIONS AND RECOMMENDATION

The study concluded that the golden apple snail (*Pomacea canaliculata*) flavored *chicharon*, developed in three variants—unflavored, garlic-flavored, and cheese-flavored—was generally well-received, with the cheese-flavored variant being the most highly acceptable across all respondent groups. The nutritional analysis revealed that the product is a high-protein, moderate-fat snack with lower total calories compared to traditional pork *chicharon*, making it a healthier alternative. The shelf-life assessment indicated that the product maintained its quality for up to one week at room temperature, with noticeable degradation in texture and appearance by the fourth week. Overall, the golden apple snail flavored *chicharon* is a nutritious and innovative snack with potential commercial viability, given optimized packaging and storage conditions.

Based on the findings and conclusions, several recommendations were proposed to enhance the development and marketability of the golden apple snail-flavored *chicharon*. Firstly, it is recommended to develop and test advanced packaging solutions to extend the product's shelf life, ensuring it remains crispy and visually appealing for a longer period, thereby increasing its marketability. Secondly, seeking support from government agencies

like the Department of Science and Technology (DOST) and the Department of Trade and Industry (DTI) for the implementation of targeted marketing strategies is advised. These strategies should emphasize the cheese-flavored variant for younger consumers and highlight the nutritional benefits and unique flavors of the garlic and unflavored variants for adults and food experts. Additionally, clear labeling of the nutritional content on the packaging, including detailed information on protein, fat, and calorie content, is essential to attract health-conscious consumers and differentiate the product from traditional pork *chicharon*. Moreover, exploring and developing additional flavors to cater to diverse taste preferences could potentially increase the product's appeal and expand its consumer base. Finally, providing clear storage instructions on the packaging to help consumers maintain the product's quality and freshness is crucial, advising on the best practices for keeping the *chicharon* crisp and delicious for longer periods.

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