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Research Article

Production and Analysis of Golean as Alternative Tea

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ABSTRACT

This study developed and evaluated GOLEAN Alternative Tea, made from Bottle Gourd skin, Lemongrass leaves, and Anonang leaves as an alternative herbal beverage. Using descriptive and experimental research design, 90 respondents, composed of 30 tea consumers, 30 tea makers, and 30 tea sellers, assessed its acceptability and marketability in Marikina City during the School Year 2024-2025. The tea exhibited low moisture content (12.0 g/100g), a pH of 6.04, minimal vitamin C (<1 mg/100g), and acceptable microbial levels (1.2×10^2 CFU/g). Assessments were conducted using the Nine-Point Hedonic Rating Scale for acceptability and the Five-Point Likert Scale for marketability. Statistical analysis was performed using Weighted Mean and One-way ANOVA. Findings revealed that consumer respondents rated the tea as "Extremely Acceptable" (EA) with scores of 8.54, 8.60, and 8.51 for proportions A, B, and C, respectively. Significant differences in taste perception were observed among the groups, while no significant differences were found in marketability evaluations. The marketability ratings indicated that proportions A (4.76), B (4.79), and C (4.79) were deemed "Very Highly Marketable." In conclusion, the study confirms the viability of GOLEAN Alternative Tea as a natural and affordable herbal beverage, highlighting its potential for high acceptability and marketability while addressing challenges and offering recommendations for improvement based on respondent feedback.

Keywords*: GOLEAN Alternative Tea, Acceptability, Marketability, Physicochemical analysis, Consumer evaluation, Herbal tea*

Introduction

The modern lifestyle of Filipinos has significantly impacted various aspects of their lives, including dietary choices. Globalization has brought advancements in technology, economics, and social structures, resulting in improvements in communication, manufacturing, and transportation (Stevens et al., 2022). However, these advancements have also led to increased availability of processed foods with prolonged shelf life, contributing to a rise in health issues linked to poor dietary habits.

Herbal teas, derived from a variety of plants, offer a promising alternative. These

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beverages can be made from fresh or dried roots, stems, leaves, fruits, flowers, seeds, and even whole plants from multiple species. Unlike traditional teas, herbal teas are prepared by infusing and boiling various plant materials, making them a popular choice globally (Liu et al., 2023). Tea is the second most consumed beverage in the world, following water, with origins tracing back to ancient medicinal practices in China during the 3rd century AD. Merchants played a crucial role in facilitating its spread across continents (Harvard University, 2023).

The motivation for this study stems from the researcher's personal experiences as a mother. The researcher aims to provide readily available, health-promoting beverages, particularly for postpartum mothers. After each childbirth, the researcher relied on herbal teas made from Anonang leaves (Cordia myxa) to alleviate muscle spasms and promote recovery. This traditional remedy has proven invaluable, highlighting the potential of natural ingredients in enhancing health (Dziwenji et al., 2023).

Research indicates that Cordia myxa possesses muscle-relaxing properties, suggesting its therapeutic potential (Wani, 2024). Moreover, utilizing by-products like Bottle Gourd skin and Lemongrass leaves can address environmental concerns by reducing waste. The Food and Agriculture Organization (FAO) reports alarming levels of food waste globally, with approximately 1.3 billion tons of edible food discarded each year (Prokic et al., 2022). This highlights the need for sustainable practices in food production.

In addition to health benefits, marketing herbal teas as affordable alternatives can provide additional income for families. Increased consumer interest in herbal products correlates with higher spending patterns, indicating a viable market opportunity (Team, 2022). Studies have shown that factors such as education and employment positively influence herbal tea consumption, potentially enhancing the local herbal tea industry (Hussain et al., 2023).

Despite these numerous benefits, there are currently no herbal teas available in the market made from the skin of Bottle Gourd (Lagenaria siceraria), Lemongrass leaves (Cymbopogon citratus), and Anonang leaves (Cordia myxa). This gap underscores the significance of the present study, which aims to explore the acceptability and marketability of GOLEAN Alternative Tea, leveraging local resources for health and economic benefits.

Statement of the Problem

This study aims to produce and determine the acceptability and marketability of Bottle Gourd skin, Lemongrass leaves, and Anonang leaves as the main ingredients in making GOLEAN Alternative Tea, evaluated by three groups of respondents in Marikina City during the school year 2024-2025. Specifically, it seeks answers to the following questions:

1. How is GOLEAN Alternative Tea produced?
2. What are the results of the microbial and physicochemical analyses of GOLEAN Alternative Tea based on the following tests:
   a. Vitamin C;
   b. Moisture Content;
   c. pH Level; and
   d. Yeast and Mold?
3. What is the level of acceptability of GOLEAN Alternative Tea in three different proportions in terms of the following aspects?
   a. Appearance;
   b. Aroma;
   c. Color; and
   d. Taste?
4. Are there significant differences in the level of acceptability of GOLEAN Alternative Tea based on the evaluations regarding the above-mentioned criteria?
5. What is the evaluation of the level of marketability of the prepared GOLEAN Alternative Tea in three different proportions in terms of:
   a. Consumer Demand;
   b. Production Cost;
   c. Supply Availability; and
   d. Packaging and Labeling?
6. Are there significant differences in the level of marketability of the prepared GOLEAN Alternative Tea based on the evaluations concerning the above-mentioned criteria?
7. What comments and suggestions do the respondents offer to further improve GOLEAN Alternative Tea?

Methods of Research

This study used descriptive and experimental research design (Sirisilla, 2022), which structures the methods for conducting research with a scientific approach involving two sets of variables. The first set remains constant to measure the differences in the second set. The researcher applied both experimental and descriptive methods to ensure clarity and transparency in executing the research objectives, particularly focusing on the safety and acceptability of the product for consumption.

The experimental method was suitable as it evaluated the acceptability of GOLEAN Alternative Tea made from Bottle Gourd skin, Lemongrass leaves, and Anonang leaves based on appearance, aroma, color, and taste. Additionally, marketability was assessed through factors such as supply availability, production cost, consumer demand, and packaging.

Data Gathering Instruments

The survey questionnaire was carefully constructed and modified to assess the safety, acceptability, and marketability of GOLEAN Alternative Tea. It included demographic information, such as name, age, and gender, to provide context for the findings.

Two globally recognized scales were utilized in the questionnaire: the Nine-Point Hedonic Rating Scale and the Five-Point Likert Scale. The Nine-Point Hedonic Rating Scale, as noted by Johnson (2021), assesses sensory characteristics related to the tea, including appearance, aroma, taste, and texture. Its reliability and validity are well-documented, making it a preferred choice for sensory assessments.

The Five-Point Likert Scale was employed to evaluate marketability factors such as consumer demand, supply availability, production costs, and packaging. This scale allows respondents to express a range of opinions, enhancing the richness of the data collected (Cristina Sol, 2024). Both scales are user-friendly, promoting quicker responses and improving data quality.

Data Gathering Procedure

This study was conducted in Marikina City using an adapted and modified survey questionnaire. The questionnaire was presented to the adviser for approval and underwent validation. It included five indicators for each criterion describing GOLEAN Alternative Tea.

Proportions A, B, and C represent three variations in the ingredient ratios of Bottle Gourd skin, Lemongrass leaves, and Anonang leaves, developed to determine the optimal sensory blend for consumer preference. The safety of the product was ensured by having FASTLAB and PIPAC test the safety and nutritional value of GOLEAN Alternative Tea.

After the testing process, ten validators—five experts in Food Technology, four grammarians, and one statistician—reviewed the survey questionnaire to ensure its validity. Based on their feedback, the researcher revised the questionnaire with guidance from the thesis adviser.

The researcher prepared 90 questionnaires, which were distributed to respondents in various barangays in Marikina City along with samples of the tea for sensory evaluation. Respondents were selected informally and were personally approached. They were given time to complete the questionnaires and were allowed to ask questions about the study. However, they were not permitted to share their responses with others without permission.

The researcher personally retrieved the completed questionnaires from the three groups of respondents. Data collected was treated with utmost confidentiality, then tabulated, analyzed, and interpreted using appropriate statistical tools essential to the research study.

Statistical Treatment of Data

This study included various statistical tools for data analysis and interpretation.

Weighted Mean. This was utilized to evaluate the level of the acceptability and marketability of the prepared GOLEAN Alternative Tea in three proportions (A, B, C) as regards the following criteria: appearance, aroma, color and taste, and the marketability level in terms of supply availability, production cost, consumer demand, and packaging and labeling.

Analysis of Variance (ANOVA) is based on a statistical method to govern whether a set of people is statistically significant or there are or variation irregularities. It helps to compare

variability between and within groups to identify that can influence one or more factors on a dependent variable (W. Kenton) 2025. This was applied to test the significant differences among the evaluations of the three groups on the level of acceptability and marketability of prepared GOLEAN Alternative Tea in three proportions.

One-Factor ANOVA. also known as single-factor ANOVA, is a statistical method used to compare the means of three or more independent groups to determine if there are statistically significant differences among them. Additionally (W. Kenton) 2025. one-way ANOVA used by analyst if the collected data has one dependent variable. It is used if the variables are independent and should have at least three set or categories. ANOVA determines if the dependent variable changes according to the level of the independent variable. In the context of the GOLEAN Alternative Tea study, this method was employed to assess the acceptability and marketability of the tea prepared in three different proportions.

Tukey Pairwise Comparison. When ANOVA indicated significant differences among the means, this statistical analysis conducted to recognize the particular group difference. Additionally, Anova always used Tukey's method for multiple comparisons to create sure gap for all jointly differences between factor level means while controlling the family error rate to a level you specify (Minitab, 2025).

In addition, Tukey procedure is the commonly employed procedures for several contrast Libretexts (2022) tukey Pairwise was used to examine if there is a significant difference in the evaluation of the three groups of respondents on the acceptability level of the GOLEAN alternative Tea in three proportions (A,B,C) in terms of appearance, aroma, taste, and texture and b) if there is a significant difference in the evaluation of the three groups on the level of marketability of Golean Alternative Tea in Three proportions (A,B,C) in terms of supply availability, production cost, consumer demand, and packaging and labelling.

Microbial and Physicochemical Analysis. This allows the researcher to evaluate the natural properties of the ingredients to verify their level of acceptability and that the product must pass the standard limits required before it can be sold commercially.

It involves testing the chemical and physical properties of the materials or the ingredients. Interpretation of various physical and chemical parameters such as moisture content, pH level, vitamin C content, and yeast and mold counts. With the use of different testing methods such as air oven drying, electrometry, Titrimetry, and pour plate method.

Result and Discussion

This study aimed to develop and assess the acceptability and marketability of GOLEAN Alternative Tea, made from Bottle Gourd skin, Lemongrass leaves, and Anonang leaves, evaluated by three groups of respondents in Marikina City during the school year 2024-2025. The development process involved systematic steps including gathering, sorting, washing, blanching, dehydrating, and grinding the raw materials. This thorough approach ensured the safety and quality of the final product.

Microbial Analysis

Microbial analysis revealed a yeast and mold count of 1.2×10^2 CFU/g, which is within acceptable thresholds, indicating that the tea is safe for consumption. The physicochemical analysis showed a moisture content of 12.0 g/100g, a pH level of 6.04, and a Vitamin C content of less than 1 mg/100g. These findings confirm that the tea meets established safety and quality standards.

Sensory Evaluation

The acceptability of the tea was evaluated across three proportions (A, B, C) based on its appearance, aroma, color, and taste. Each proportion received high ratings, with mean scores categorized as "Extremely Acceptable" for appearance (8.54), aroma (8.50), color (8.47), and taste (8.54).

Analysis of variance (ANOVA) indicated no significant differences in acceptability ratings for appearance, aroma, and color among the three groups ($p > 0.05$). However, taste ratings varied significantly ($p < 0.05$), with consumers rating the tea higher than sellers and tea makers. This discrepancy may be attributed to differing palate preferences across the groups, as

consumers may prioritize sensory enjoyment, while sellers and makers may focus on market trends and production aspects.

Marketability

In terms of marketability, all groups demonstrated a very high likelihood of demand for the tea, assessing factors such as consumer demand, production cost, supply availability, and packaging. Proportion A received overall weighted means of 4.76 for consumer demand, 4.79 for production cost, 4.81 for supply availability, and 4.79 for packaging. Proportions B and C also exhibited similar positive evaluations, indicating strong marketability across all variations of the tea.

Statistical analysis confirmed that the means were not significantly different among the groups for any of the proportions ($p > 0.05$), suggesting a consensus regarding the marketability of GOLEAN Alternative Tea.

Implications of the Results

Overall, the research highlighted the successful production, safety, acceptability, and marketability of GOLEAN Alternative Tea, affirming its potential as a commercially viable product. The higher taste ratings from consumers suggest a strong preference for flavor, which could inform marketing strategies. Understanding consumer preferences can guide product development and enhance market positioning, making it essential for producers to consider sensory attributes alongside production costs and supply chains.

Comments:

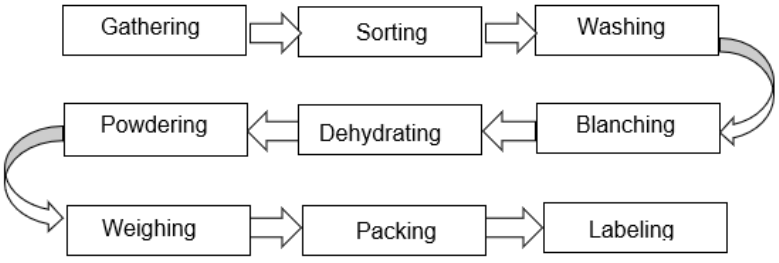
1 The product is good for consumption. It has natural taste.
2 With nice packaging and easy to read.
3 The GOLEAN Alternative Tea has accurate flavor and I feel relaxed after drinking it.
4 The B proportion is more comparable to tea available on the market and I think it is more competitive to other products available in the market.
5 For me all the ingredients, the aroma of each tea is acceptable and affordable. Most importantly it can be sold and be made available to the market.

Suggestions:

1 More leaves / herbal may be added for stronger taste.
2 All variants are highly recommended for its good taste and affordability.
3 Packaging can still be made varied for consumers' attraction with corresponding logo as trademark of the products.
4 Packaging can be made colorful as one of the marketing strategies to employ.

Production and process of raw materials used in making GOLEAN Alternative Tea.

It shows the Production and Process of Bottle gourd skin, Lemon grass leaves and Anonang leaves used in making GOLEAN Alternative Tea in three different proportions (A, B, C).



GOLEAN Alternative Tea Production Process

As illustrated in Figure 5, the researcher first gathered the raw materials like Bottle gourd skin, Lemongrass leaves, and Anonang leaves as ingredients needed for the GOLEAN Alternative Tea. Researchers sorted the raw materials properly, carefully washed them, and then blanched them to kill some bacteria enzymes existing in the raw materials. They were

dehydrated to dry out the ingredients using an oven or dehydrator. Using the disintegrator or food processor, the next step was to powder the dried Bottle gourd skin, Lemongrass leaves, and Anonang leaves. Weighed the ingredients according to their proportions, to get the best flavor and benefits of the alternative tea. Next, the researcher weighed and packed the GOLEAN Alternative Tea for safety according to consumer demands, and specifications. Lastly, put in the individual tea bag as primary packaging, then foil packaging for the secondary packaging, and a box to cluster the product that will fit the standardized safety of the product.

Conclusion

The following conclusions are drawn from the findings of the study:

1. A combination of Bottle Gourd skin, Lemongrass leaves, and Anonang leaves can be effectively used to produce an alternative tea.
2. Based on the microbial and physicochemical analysis, GOLEAN Alternative Tea contains low acidity levels, low moisture content (12.0 g/100g), an acceptable pH level (6.04), and yeast and mold counts (1.2×10^2 CFU/g) that are safe for consumption.
3. GOLEAN Alternative Tea Proportion C received the highest acceptability ratings, being classified as "Extremely Acceptable" by consumers, sellers, and tea makers, with mean scores of 8.51 for appearance, aroma, color, and taste.
4. The marketability evaluation indicates strong potential for GOLEAN Alternative Tea, with Proportion A receiving an overall weighted mean of 4.76 for consumer demand, demonstrating significant interest from all groups.

Recommendations

Based on the findings and conclusions of the study, the following

recommendations are made:

1. Future researchers should replicate this study to validate these findings and explore further variations of GOLEAN Alternative Tea.
2. Conducting additional physicochemical analyses is highly recommended to determine comprehensive nutritional facts and information, which should be a major priority in food innovation research.
3. Performing shelf-life laboratory tests is essential to evaluate the product's freshness and stability over time.
4. Future research may explore combinations of different herbal plants to develop new variants of tea, enhancing product diversity.
5. To maximize market potential, collaboration with nutritionists and packaging designers is advised to optimize the product for commercial application.
6. Sensory re-evaluation after shelf-life testing should be conducted to assess the stability of sensory attributes over time, ensuring continued consumer acceptance.
7. The product could be presented as samples in school canteens as a marketing strategy to generate interest and establish it as a potential source of income for students.

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