PANTAO
International Journal of the Humanities and Social Sciences
ISSN 3028-0877
Volume 3, Issue 2 (2024)

Acceptability of oregano-calamansi (orca) ice cream

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Abstract: One of the major concerns of people today is health. People are striving to adopt a healthy lifestyle, particularly with regards to the foods they consume, including desserts. Fruits, vegetables, and herbs like oregano and calamansi can be consumed. Hence, this study was conducted to determine the acceptability of oregano-calamansi ice cream. The study used the Developmental-Experimental method of research using a Completely Randomized Design (CRD). The sensory qualities were evaluated by 10 semi-trained panelists and the acceptability of the products was evaluated by 100 consumers. Scorecards with the Nine Point Hedonic Scale was used to obtain the data. The mean and Analysis of variance (ANOVA) were used to analyze the data set at a 0.01 level of significance. The findings of the study revealed that the sensory qualities of oregano-calamansi ice cream in terms of its appearance, aroma, creaminess, taste, and texture were generally positively received and accepted by the semi-trained panelist, as revealed by their respective ratings. The oregano-calamansi ice cream was generally liked extremely by the consumers. Among the three treatments, Treatment C (60 ml oregano extract with 10 ml calamansi juice) was the most acceptable. There was a significant difference in the sensory qualities of oregano-calamansi ice cream in terms of appearance, aroma, creaminess, taste, and texture in favor of Treatment C (60 ml oregano extract with 10 ml calamansi juice). Likewise, there was a significant difference in the general acceptability of oregano-calamansi ice cream in terms of appearance, aroma, creaminess, taste, and texture in favor of Treatment C (60 ml oregano extract with 10 ml calamansi juice).Hence, it was suggested that considering the appeal of the product to the probable target market. There is a huge possibility of mass production of the formulated product of the oregano-calamansi ice cream for commercialization.

Keywords: oregano, calamansi, and ice cream

Date Submitted: May 10, 2024
Date Accepted: May 27, 2024
Date Published: May 29, 2024

INTRODUCTION

Filipinos extremely love ice cream. It is not just a treat, but a part of life and celebrations. People are always enjoying their favorite ice cream flavors, regardless of the weather, whether it is pouring down rain or extremely hot outside. Filipinos have a deep affinity for this frozen treat, whether they are eating conventional flavors like mango and ube or more daring ones. When it comes to family get-togethers, excursions, and even a fast pick-me-up on hectic days, ice cream is a staple food. Because of its creamy sweetness, many people in the Philippines are happy and smiling.

Ice cream is a very popular type of food around the world and is eaten both after and in between meals (Bedford, 2022). People in today's generation are keen to consume a nutritious diet since health concerns are top of mind due to increased sensitivity and awareness of several incurable lifestyle diseases. Therefore, this study offers hope to those who are health-conscious about leading happy and healthy lives by reducing their intake of sweets.

Oregano is used to treat respiratory issues, and digestive problems. It can be used as an antibacterial, antifungal, and it also have anti-inflammatory effects. Calamansi is rich in vitamin C, and it is useful in boosting immunity, improves skin health, serving as a digestive aid, helping weight management, containing antioxidant properties, and is beneficial for respiratory health.

With these numerous health advantages, one could definitely come up with many ways to develop and try new foods that people enjoy. Hence, this developmental-experimental study aimed to develop oregano-calamansi ice cream.

Statement of the problem

Generally, this study aimed to formulate, analyze, and the acceptability of oregano-calamansi ice cream in terms of appearance, aroma, creaminess, taste and texture in three treatments.

LITERATURE REVIEW

Oregano

Oregano, scientifically known as *Origanum vulgare*, is a herb that is commonly referred to by various names including wild marjoram, mountain mint, origanum, wintersweet, and winter marjoram. This plant has a prostrate growth habit and possesses potent aromatic qualities. Its leaves and stems are succulent. Oregano leaves are heart-shaped, have toothed edges, and may grow up to 9 meters in length. In other nations, the plant is predominantly utilized as a culinary component. Nevertheless, in countries such as the Philippines, Oregano is recognized as a natural remedy due to its potent anti-oxidant characteristics. Oregano contains a molecule called rosmarinic acid, as well as thymol and carvacrol, which are responsible for its anti-inflammatory, anti-bacterial, anti-oxidant, and anti-fungal properties. Oregano also contains vitamin A.

Recent studies have demonstrated the efficacy of its antibacterial qualities in treating infections of the reproductive tracts. This makes it an appropriate treatment option for postpartum mothers. The presence of volatile oils in oregano is thought to contribute to the inhibition of food spoiling, hence reducing the potential ingestion of hazardous bacteria, parasites, and fungi. Oregano's anti-oxidant capabilities combat free radicals in the body, which induce cellular damage and expedite the aging process.

Free radicals are thought to play a role in various degenerative conditions such as osteoarthritis, atherosclerosis, and cardiovascular disorders, among others. The leaves of this plant are the most beneficial components. The essences and fluids derived from these substances are employed to treat conditions such as asthma, indigestion, persistent coughs, inflammation of the bronchial tubes, and rheumatic disorders. Ear pains can be effectively treated using a concoction made from the leaves of the plant. Applying poultices made from the leaves directly to the affected area might alleviate unpleasant swellings, boils, and sprains (Philippine Herbal Medicine, 2022).

The extract of oregano leaves is a notable reservoir of dietary fiber as well as vitamins A, E, C, and K. Vitamin A has a crucial role in maintaining the immune system and is essential for maintaining optimal eye health. Vitamin C and E function as antioxidants, providing cellular protection. Vitamin K has a crucial role in the coagulation of blood. Oregano is rich in folate, iron, calcium, magnesium, and vitamin B6. These nutrients aid in the production of DNA and RNA, the metabolism of bones, the prevention of anemia, and the promotion of normal brain function. In addition, it also includes potassium, manganese, and copper. It contains a significant amount of antioxidants that aid in the neutralization of free radicals. The presence of lutein, cryptoxanthin, and zeaxanthin as carotenoids in this product is essential for maintaining optimal eyesight health. Medicinally, it is efficacious for treating colds, influenza, dyspepsia, and the management of the menstrual cycle. Leaves and flowers act as gentle stimulants that promote the secretion of bile from the gall bladder into the intestines, so facilitating digestion and relieving gas pains. Oregano leaves are widely used in the Philippines as effective treatments for coughs and colds. The leaves are frequently

subjected to boiling and ingested in order to induce relaxation in the body (National Nutrition Council, 2022).

Oregano's antioxidant properties can help decrease the buildup of free radicals and enhance overall health. The flavonoid and phenolic chemicals found in oregano have the potential to reduce inflammation within the body. Consuming it may alleviate specific inflammatory diseases, such as muscle or joint discomfort, skin irritation, or dry coughs, due to its anti-inflammatory properties. The presence of oils in oregano can inhibit the proliferation of several organisms, including specific strains of pathogenic bacteria and viruses. Consequently, oregano may possess the capacity to treat or prevent specific categories of illnesses.

Additionally, it possesses beneficial properties in terms of its ability to combat bacteria and viruses. In a 2011 study conducted on humans, it was discovered that the application of an ointment containing oregano extract effectively reduced the likelihood of surgical wound infection by reducing bacterial contamination. A laboratory study demonstrated the efficacy of oregano essential oil against certain respiratory viruses, including one that can lead to severe respiratory infections in children (Philippine Healthline Network, 2019).

Calamansi

Calamansi or calamondin (*Citrofotunella microcarpa*) is a fruit tree native to the Philippines. Among the citrus species, it is the most often grown garden tree due to its adaptability to a wide range of environmental conditions. It is a small tree with a height ranging from 2 meters to 7 1/2 meters at maturity. Its large, egg-shaped leaves have a pale green underside and a dark green upper surface. The fruit is round, about 2cm to 4.5cm in diameter, and greenish-yellow in color.

The calamansi fruit, like its relatives the mandarin, pomelo, and sweet orange, is high in iron, calcium, phosphorus, and vitamin C, also known as ascorbic acid. Its juice is nutritious and traditionally made into a fruit drink that helps strengthen the bones and stimulate growth especially among growing children. It can be used to a variety of food preparations, including fish steak, or used as a flavoring element in sweets like leche flan. Its pulp is a key component of syrups concentrates, purees, and drinks. The peel is used to make marmalade, sweets, and jams. With its alkalizing effect on the body, calamansi helps circulate blood evenly and facilitates normal digestion. Filipinos can have a year-round supply of this versatile citrus fruit by growing the plant right in their front yards or backyards or even in big plant boxes (Department of Agriculture, 2022).

Calamansi, also referred to as "lemonsito" by Bisaya-speaking Filipinos and "kalamunding" by Kapampangan, is a native citrus plant in the Philippines. Originating from the Philippines, this plant species was initially brought to other regions of Asia by traders who traversed the trade routes between East Africa and India. The Department of Agriculture (DA) has recognized calamansi as a highly significant fruit crop cultivated throughout the Philippines, owing to its extensive output nationwide.

It is the fourth largest in terms of area and output, following banana, mango, and pineapple. The calamansi tree reaches a height of approximately 25 feet when fully grown and produces little green citrus fruits that have an average diameter of 1 inch. The pulp of this fruit possesses a unique tangy taste that can be characterized as a combination of lime and orange. Many individuals have observed that its tartness complements other juices, such as banana, apple, grape, papaya, mango, and even coconut water (Business Mirror, 2023).

Calamansi has been utilized as a traditional medicinal treatment for many years due to its abundant quantities of Vitamin C and other advantageous components. Boosting the immune system performance may aid in combating illnesses such as the common cold or flu viruses. In addition to its immune-enhancing qualities, calamansi can also assist in digestion.

Calamansi is recognized for its natural ability to alleviate symptoms of acid reflux, bloating, and gas, making it an effective digestive aid. Despite its elevated citric acid content, individuals consume it as a calming agent for the gastrointestinal tract due to its capacity to enhance digestion and mitigate the occurrence of diarrhea.

Calamansi juice is recognized for its ability to relieve constipation by promoting the secretion of bile in the body. Furthermore, calamansi served as a natural digestive aid, facilitating the breakdown and absorption of protein, fat, and carbs. Additionally, it has vitamin C, which facilitated the body's absorption of iron and aids in the prevention of anemia. One of the most renowned health advantages of calamansi is its ability to aid in weight loss. Calamansi is abundant in vitamin C and iron, facilitating the assimilation of essential nutrients for the purpose of weight loss in the body. Individuals seeking weight loss contemplated incorporating calamansi juice into their diet.

This juice enhanced basal metabolic rate, leading to increased fat oxidation throughout the day. Additionally, its detoxifying properties promoted optimal functioning of all organ systems, hence facilitating calorie expenditure. Calamansi has been discovered to have beneficial effects on those with diabetes by effectively managing diabetes symptoms. It has a high concentration of citric acid, which aids in the dissolution of kidney stones. Additionally, it included calcium and potassium. These minerals mitigated the likelihood of kidney stone formation by regulating blood pressure, inhibiting mineral excretion in urine (which can lead to kidney stones), and diminishing inflammation. In addition to its effect in preventing kidney stones, calamansi juice also promotes kidney health.

METHODOLOGY

Research design

The developmental-experimental method of research was used to conduct this study. The experimental method is a systematic and scientific approach to research in which the researcher manipulates one or more variables, and controls and measures any change in other variables. For this study, the developmental method involved situations in which the product-development process is analyzed and described, and the final product is evaluated. In this study, the developmental phase involved the creation of oregano-calamansi ice cream in three different treatments.

Locale of the study and respondents

The participants of the study were 100 evaluators for the general acceptability which were composed of 25 food establishment owners; 25 food technology students of Capiz State University; 25 housewives; and 25 consumers.

Research instruments

The instrument that was employed in this study is an evaluation scorecard utilized to examine the sensory attributes of the ice cream, encompassing its visual appeal, scent, smoothness, flavor, and consistency. In addition, assessment sheets were used to collect comments from the panelists and evaluators evaluating the overall acceptance of the ice cream product. These equipments enabled the organized gathering of data on the sensory characteristics and overall preference of the oregano-calamansi ice cream under various conditions.

Data analyses procedure

The data were collected and statistically analyzed using the Arithmetic Mean and the Analysis of Variance (ANOVA) using the SPSS, a statistical tool used for data processing and analysis. The Analysis of variance (ANOVA) was used to determine the significant difference

among the three treatments A, B, and C. The ANOVA is set at 0.01 alpha level and used to determine the significant difference on the appearance, aroma, taste and texture.

FINDINGS AND DISCUSSION

This study determined the preferences of the 100 consumers such as teachers, students, and potential consumers (housewives, vendors, and food enthusiasts) oregano-calamansi ice cream in terms of its appearance, aroma, creaminess, taste, and texture.

Generally, Treatment A, B, and C were "Liked Extremely" and potential products for development as shown by the grand mean ratings of 8.56, 8.56, and 8.66, respectively. However, the consumers of the product have generally preferred Treatment C among other variants when preparing oregano-calamansi ice cream products.

The general acceptability of oregano-calamansi ice cream is already established, since other products using this ingredient have been well-received by consumers.

The result of this study aligns with the findings of Granato et al. (2018) that had focused on the incorporation of oregano in ice cream formulations. Sensory tests had revealed mixed reactions, with some consumers appreciating the novel flavor while others found it unusual. This indicated a need for careful balancing of oregano to optimize acceptability in ice cream.

The results of this study conform with the findings of Catulinan et al., (2022), which found that oregano gummy candies were highly accepted as an alternative cough remedy. The results indicated that the Ingredients, Procedural Methodology, Effectiveness, and Presentation were all highly acceptable. The overall mean of the Pharmaceutical Scientists was 4, interpreted as Highly Acceptable, and the STEM Teachers had an overall mean of 3.9, also interpreted as Highly Acceptable. The t-computed was 0.61, and the t-critical was 2.160, indicating no significant difference between the assessments of the two groups of respondents.

Extensive study has been conducted on the blood sugar-regulating properties of calamansi juice. It has the ability to control the release of glucose and insulin into the bloodstream, which is beneficial for individuals with diabetes or those who are susceptible to developing the condition (Khan, 2023).

CONCLUSIONS AND RECOMMENDATION

The study's findings and objectives led to various conclusions on oregano and calamansi extracts as ice cream flavorings. The first step was to prove that these extracts can flavor ice cream as well as commercial products. The formulation with 60 ml of oregano extract and 10 ml of calamansi extract was most preferred by assessors, suggesting its potential as a flavor profile. The other treatments showed promise for improvement, however.

Different mixtures of oregano and calamansi extracts caused sensory variations between treatments. This shows that the extract mixture greatly affected the ice cream's flavor and acceptance. It was also thought that the combination of extracts may have affected ice cream acceptability across treatments.

The study's surprising finding was that oregano-calamansi ice cream's characteristics remained constant after adding these flavorings. The natural preservation characteristics of oregano and calamansi may help preserve the ice cream's quality. These findings show that oregano and calamansi extracts can be used to flavor ice cream in creative, tasty ways while preserving natural preservatives.

Several recommendations have been created to maximize the potential of oregano-calamansi ice cream based on the study's outcomes. Firstly, there is a proposal to advance the product in order to augment its attractiveness and distinctive features. This may entail

improving the formulation to enhance the taste and consistency, as well as investigating novel variations to accommodate a wide range of consumer tastes.

Furthermore, the researcher is advised to further investigate the various differences discovered across the three treatments, since these variations could be used as persuasive selling points for the product. An example of this would be to highlight the utilization of entirely organic components, which could appeal to individuals who prioritize their well-being and are interested in choices that are free from preservatives.

Moreover, it is recommended that consumers view oregano-calamansi ice cream as a more health-conscious option compared to conventional varieties, as it utilizes natural flavorings rather than artificial ingredients that are known to have negative effects on health. It is advisable to do additional research to analyze the nutritional characteristics of the product, elucidating its possible health advantages.

Lastly, future research efforts could investigate the inclusion of supplementary components other than extracts to broaden the product's range of flavors and enhance its attractiveness in the market. By adhering to these suggestions, those with a vested interest can optimize the potential of oregano-calamansi ice cream as a unique and health-conscious choice for dessert in the marketplace.

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