POTENTIALS OF FOOD PRODUCTS FROM KERSON (MUTINGIA CALABURA LINN.) FRUIT FOR ENHANCEMENT OF GASTRONOMIC TOURISM IN ROXAS CITY

Lorenzo G. Rojo
Filamer Christian University, Philippines

INTRODUCTION

With the scientific name *Mutingia calabura* Linn, the Kerson tree is commonly known in Tagalog as *aratiles, datilis, seresa*, or *sarisa* in Ilonggo, and in Thai Takhop farang, Is a widespread tree found in the backyard or along the roads. But even though it is a widespread fruit tree, it is still one of the most under-utilized trees. It is mainly a shed tree during the hot season, and its fruits are only familiar to rural kids and as food for birds and bats. During the COVID-19 pandemic, the researcher developed food products from Kerson fruit. Under-utilization of Kerson fruit motivated the researcher to think about what possible food products can be created from it and how it can be a potential source of economic gains and help boost gastronomic tourism, particularly in Roxas City and the province of Capiz. This study pioneers the development and production of food and beverage products using Kerson fruits as the main ingredient. Also, this study will help augment the gastronomic tourism destination image of Roxas City as the home and the origin of Kerson food products.

The research gap this study will fill in is the lack of existing literature and published studies, only some studies or research have been conducted about food products using Kerson fruit as the main ingredient or as a supplementary ingredient for culinary tourism or personal or business purposes. Most studies are available on the health benefits and possible medicinal use of the Kerson tree, its fruits, leaves, roots, and bark. This study could also answer the call of the Department of Agriculture's campaign to utilize underutilized fruit crops, wherein Kerson fruit was one of the fruit trees mentioned in the said campaign. Eleazar (2015) said, "one has to emphasize the potential role of underutilized plant species in contributing to global food security and nutrition, buffering against the consequences of climate change, and agricultural biodiversity reduction. BAR believes its potential may be unleashed through focused and extensive research and development (R&D) activities (p. 3).

The products used in this study, the Kerson Ice Cream, Kerson Bread, Kerson Cookies, Kerson Patty, and Kerson Siomai, were developed after the first study conducted by the researcher. The first study undertaken was entitled, Kerson Fruit (Aratiles) Drink: Market Acceptability, Potential Market Demand, and Social Health and Environmental Benefits Awareness which was presented to the Research and Continuing Education Center of Filamer Christian University and was also presented to the first International Convention and International Research Forum of the Council of Hotel and Restaurant Educators of the Philippines (COHREP) in Bali Indonesia, last January 2020. After the products were developed, this study was conducted to determine the potential of those products in enhancing gastronomic tourism in Roxas City.

Gastronomy Tourism is a tourism activity characterized by the visitor's experience linked with food and related products and activities while traveling (unwto.org/gastronomy-wine-tourism, 2021). According to Herrera et al. (2012), "current research in gastronomic tourism is scarce and is mainly focused on wine, and "oenotourists" are not necessarily the same individuals who engage in other, nonoenological gastronomic activities." Roxas City is known as the seafood capital of the Philippines. This is due to the volume of seafood production in the city. This also makes Roxas City one of the region's gastronomic destinations. However, aside from seafood, the city could offer no other distinctive food products to provide more gastronomic experiences for tourists visiting Roxas

City.

Lastly, the conduct of this study joins the movement of the Department of Tourism to promote Culinary and Gastronomic Tourism as one of the major tourist attractions all over the country. DOT secretary Puyat-Romulo said that "food has been impacting tourism industries worldwide. As a country brimming with heirloom recipes, food-centric festivals, culture, and olden cooking practices, the Philippines is not behind in this feat. The DOT believes in the potential of Filipino food that we have identified culinary and gastronomic tourism as an essential tourism product in the National Tourism Development Plan" (Puyat-Romulo, 2019, para. 5&6).

Statement of the Problem

The study aimed to determine the potential of food products from Kerson fruit (*Mutingia calabura* Linn.) for enhancing gastronomic tourism in Roxas City.

Specifically, the study sought to answer the following:

1. What is the most preferred food product developed from Kerson (*Mutinigia calabura* Linn.) fruit?
2. What is the potential of food products produced from Kerson fruit (*Mutingia calabura* Linn.) for the development of gastronomic tourism in Roxas City as to:
   a. Acceptability
   b. Demand
   c. Sustainability
3. What challenges are faced by the food products from Kerson fruit (*Mutingia calabura* Linn.) as a potential product for gastronomic tourism in Roxas City?
4. Which food products affect the potential of Kerson fruit (*Mutingia calabura* Linn.) in enhancing gastronomic tourism in Roxas City?
5. What work plan can be recommended to enhance gastronomic tourism in Roxas City?

Hypotheses

Given the problems stated, the following were hypothesized:

1. None of the food products can affect the potential of Kerson (*Mutingia calabura* Linn.) fruit in enhancing gastronomic tourism in Roxas City.

The hypothesis will be accepted at a .05 level of significance.

Theoretical Framework of the Study

The theory used in this study is the Adoption Theory-Theory of Production (Bhasin, 2018). It has a simple objective – To observe new product adoptions and new product diffusion in the market to understand how and why, and to what extent individuals or organizations adopt a new product. It can also be called the theory of product adoption. Here are a few essential points about the adoption theory. The adoption theory assumes multiple influencing factors responsible for the customer's decision. These factors include the consumers' knowledge and awareness of the product, their acceptance of innovation, and their buying experience. The marketer thus gathers more information to influence purchasers to buy the product, resulting in faster product penetration (par. 1&6).

This study will bring awareness to the consumer about the food and beverage products from Kerson fruit and determine how the consumers will accept these products and how willing they are to buy them. The commercialization and product market penetration of the developed food and beverage products from Kerson fruit will be another study to be implemented in the adopted communities of the college and the university to provide them with a sustainable source of livelihood.

Conceptual Framework of the Study

The conceptual framework of this study comprises products developed from Kerson fruit as the independent variables and gastronomic tourism as the dependent variable. The developed products from the Kerson fruit were assessed for acceptability, demand, and sustainability of gastronomic tourism. Strategic plan for gastronomic tourism was developed to enhance gastronomic tourism in Roxas City.

The Conceptual Framework Showing the Relationship among Variables

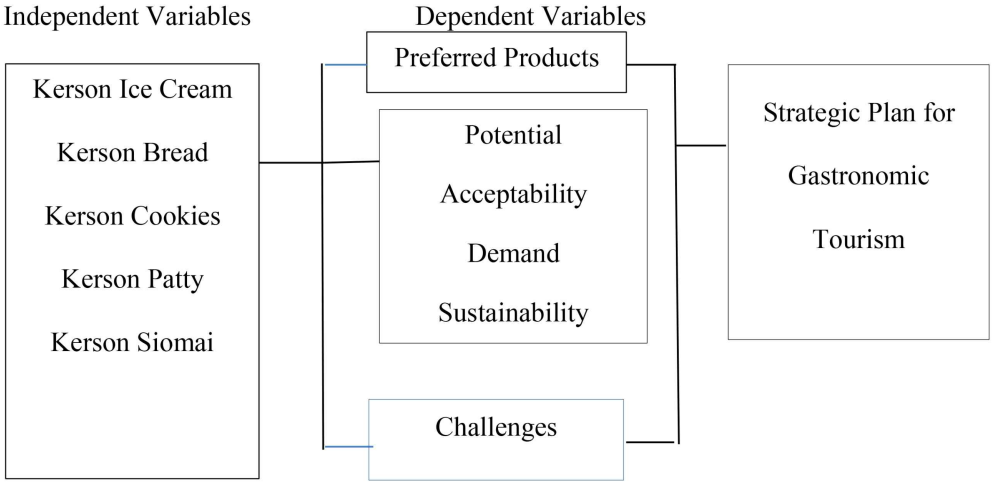

Figure 1 shows the conceptual framework of the study.

LITERATURE REVIEW

Kerson Fruit

They are locally known as Aratiles or Latires in Tagalog, Datiles, Sarisa, or Serisa in Bisaya or Hiligaynon dialects, with a binomial name Mutingiacalabura with a variation trinitensis. Muntingiacalabura is a shrub or tree up to 12 m. tall with spreading branches. The leaves are alternate, distichous, oblong, or lanceolate, 4–15 cm long and 1–6 cm wide, with a toothed margin and covered in short hairs. The flowers are small (up to 3 cm wide), solitary, or inflorescences of 2-3 flowers; with five lanceolate sepals, hairy; 5 obovate white petals; many stamens with yellow anthers and a smooth ovoid ovary—fruit, an edible berry, red at maturity, about 1.5 cm wide. Mutingia calabura is native to southern Mexico, the Caribbean, Central America, and western South America, south of Bolivia and Argentina. It is in a tropical climate in disturbed lowland areas from sea level to 1000 m. elevation. It thrives in poor soil, can tolerate acidic and alkaline conditions and drought, and does not grow in saline conditions. Birds and fruit bats disperse the seeds. Although native to tropical America, Mutingia calabura has been introduced in Southeast Asia and naturalized in other tropical parts of the world (Wikipedia.org, 2020).

Haider (2015) defines Kerson Fruit, or *Muntingia calabura*, as a fast-growing tree with a cherry-like fruit with multiple health benefits. Its health benefits are only known to a few. There are many health benefits the Kerson tree, both its fruits, leaves, flowers, bark, and roots can provide us. The benefits from fruits are the following: the fruits have antibacterial properties, are a huge source of vitamin C, provides gout relief, are a great relief for headache, helpful for those with diabetes, it has strong antioxidant properties, and it contains some essential nutrients such as fiber, carbs, protein, calcium, phosphorous, iron, and B-vitamins, which are some great mood enhancers (Lifehack.org, 2020).

Kerson Fruit has many health benefits and nutritional values from the bark to the leaves: Fights with bacteria; anti-inflammatory properties; helps in brain function; fights with cancer; anti-uric acid; anti-tumor; ant-nociceptive; cytotoxic; anti-hypotensive effect; anti-gastric; anti-diabetic; helps in abdominal cramps; fibrous, helps in gastric ulcer; helps the immune system; cardiovascular protection and anti-headache.

Contents In Aratilis/Kerson Fruit

Aratilis contains almost all the nutrition in them. Every 100 grams of Aratilis contains, Water – 77.8 gms; Protein – 0.384 gms; Fat – 1.56 gms; Carbohydrate – 17.9 gms; Fibre – 4.6 gms; Abu – 1.14 gms; Calcium –124.6 mg; Phosphorus – 84 mg; Iron – 1.18 mg; Carotene – 0.019 g; Thiamin – 0.065 g; Riboflavin – 0.037 g; Niacin – 0.554 g; Vitamin C – 80.5 mg; Energy Level – 380 KJ (mavcure, 8-26-2021)

A 16-year-old Iloilo high school student has reportedly discovered that Aratiles has the potential to cure type 2 diabetes. Maria Isabel Layson was

recognized by the 2019 Intel International Science and Engineering Fair (ISEF) for her study, "Bioactive Component, Antioxidant Activity, and Antidiabetic Properties of Muntingia calabura Linn: An In Vitro Study" (Severo, 2019).

Several bioactive compounds, primarily flavonoids (flavones, flavanones, and flavans), have been isolated from the roots, bark, wood, leaves, and flowers of M. calabura. Extracts containing these compounds have been reported to have antioxidant, antimicrobial, anti-inflammatory, antidiabetic, anticancer, hypotensive, and antipyretic properties, so the species has great potential for developing plant-derived drugs (Kuo et al., 2014; Mahmood et al., 2014).

According to Mahmood et al. (2014), "with regard to the relationship between the observed pharmacological activities and the different parts of *M. calabura* tested, several conclusions can be proposed. Only the leaves and fruits of *M. calabura* were confirmed to be safe for consumption and have antioxidant effects.

The literature and studies about the Kerson tree, its fruits, and other parts are about its health, medicinal potential, and environmental benefits. Conducting this study on food and beverage product development from Kerson fruit will put more added value on the Kerson tree and its fruit and will turn it from an underutilized tree or crop in the Philippines into a more valuable tree that could help provide food sustainability and provide healthy food alternatives to the country.

Gastronomic Tourism

The Committee on Tourism and Competitiveness (CTC) of UNWTO defines *Gastronomy Tourism* as a tourism activity characterized by the visitor's experience linked with food and related products and activities while traveling (unwto. gastronomy-wine-tourism, 2021).

However, the role of food in the marketing of destinations has, until recently, received very little attention globally and locally. All indications, though, are that local food holds much potential to enhance sustainability in tourism; contribute to the authenticity of the destination; strengthen the local economy, and provide environmentally friendly infrastructure(Psarros, 2010).

Gastronomy can be described as discovering, tasting, and experiencing food preparation. However, gastronomy is much more than food. It is the beautiful connection between culture, people, and food (Grandcourt, 2019).

Gastronomy is a crucial resource in the proposal of value and differentiation of destinations, and gastronomy tourism has become a market segment. However, there is a pending challenge in promoting and implementing strategies and action plans that maximize the results. Corporate and personal social responsibility must be incorporated into this exercise (3rd UNWTO World Forum on Gastronomy Tourism, 2017).

Gastronomic tourism is an emerging phenomenon being developed as a new tourism product due, among other things, to the fact that, according to the specialized literature (among others, Quan and Wang, 2004), over a third of tourist spending is devoted to food. Therefore, the destination's cuisine is of utmost importance in the quality of the holiday experience (Global Report on Food Tourism, UNWTO, 2012, p. 22).

The development of gastronomy tourism represents valuable opportunities in rural areas to build inclusive economies as it can boost local businesses, social and economic integration, personal fulfillment, and social development. Gastronomy tourism adds vitality to rural communities connected via marketplaces, festivals, stories, recipes, and memories. It supports small, local food producers and strengthens their position in the market, adding value to the tourism experience while promoting the preservation and development of local produce, culinary traditions, and know-how (6TH UNWTO World Forum on Gastronomy Tourism, 2021, p.1).

Gastronomy tourism today cuts across many tourism products. It has expanded the possibilities for enjoyment and knowledge offered by good-quality local gastronomy products in the different territories and by the possible activities in their production and processing environments. Therefore, gastronomy tourism is based on knowing, learning, eating, tasting, and enjoying the gastronomic culture identified with a territory (Guidelines for the Development of Gastronomy Tourism, 2012, P. 8).

In 2000, scholars inspired by the theme of endless food festivals and other food-related

activities put forward gastronomic tourism. It has now become an essential branch of special-interest tourism. From only one of the six elements of tourism attractions to gastronomic tourism, the relationship between local food and tourism has become increasingly close (Su, 2015, par. 1).

Consequently, from a visitor experience point of view, culinary tourism elicits increased local gastronomic interest and promotes slow tourism in rural and urban areas (de la Barre & Brouder, 2013). From a broader perspective, culinary tourism is mainly instrumental in complementing and synergizing the tourism system as a whole (de la Barre & Brouder, 2013; Lee et al., 2015; Moira et al., 2017). Therefore, culinary tourism is indispensable to solidify the tourism value chain and boost the positive local impacts of tourism (Choe & Kim, 2018; de Albuquerque Meneguel et al., 2019; Smith & Xiao, 2008).

The underlining concept of culinary tourism is also entangled with the principles of slow tourism via slow food (Slow Tourism, 2013; World Food Travel Association, 2019). In contrast to fast-paced dining practices, slow food largely focuses on consuming local cuisines and promoting sustainability principles in the food production and distribution system (Adeyinka-Oji & Khoo-Lattimore, 2013; Tommy et al., 2017).

Here slowness as a tourism product emerges, increasingly influenced by the tourist's heightened sense of responsibility towards the environment and the search for a meaningful experience. The growing demand for quality results from a transformation of industrialized societies where quality becomes a fundamental element of post-modern society, as has already occurred concerning the environment. In its slow form, post-modern tourism assumes importance in the realm of the conscience, where awareness of self and others becomes foremost in a revised relationship between guest, host, and visited locations (De Salvo & Calzati, 2018).

Shalini and Dugal (2014) state "that a destination can attract a large pool of tourists by promoting its food; tourists also get a novel experience of being deeply involved in the local culture and traditions. The stimulating benefits of food tourism have also grabbed the attention of research scholars to delve deeper into the concept of food tourism and its scope. Culinary tourism is perceived as one form of tourism product that creates interest and is a pull factor for tourists to travel. For many countries, cuisines have become a significant factor in attracting tourists".

Steinmetz (2010) Said that "in recent years, food has gained recognition by governments, businesses, and academics as an integral part of the tourism product, and as a means of differentiation for destinations. There are many benefits to be had in linking food and tourism for all stakeholders (Hall & Mitchell, 2006). Local food is a vital element that can help create a sense of 'place' and heighten destination appeal (Haven-Tang & Jones, 2006). Local produce adds authenticity to the tourist experience and motivates visitors to visit a location (Sims, 2009). Tourists may even be tempted to stay longer in one place because of the availability of food products and related activities (Hall & Mitchell, 2006).

According to Wolf (2021), a quick scan of National Geographic's social media activity, shows that 6 of every 12 of their recent travel posts were food-themed. Despite the pandemic, we still love food, drink, and travel. Now is precisely the time destination marketing organizations should champion the cause and promote their culinary cultures for when people start traveling again.

According to Nesbitt (2021), though cuisine is not often the first-factor prompting tourists to visit a particular place, food can be one of the highly-rated products of niche tourism. One of the great joys of travel is discovering the cuisine of your destinations. You can learn a lot about the history and culture of a place through its food and drink.

Privitera (2020) stated that the food and gastronomy of a local community are essential factors in determining a tourism destination. However, this largely depends on the geographical context and the territory's specific structural, infrastructural, historical, social, and human resources combined with proper marketing.

Published annually, the Kerry Taste Charts are "designed to inspire product developers by categorizing taste trends as mainstream, key, up and coming and emerging…[and are the] culmination of hundreds of hours of work, including research into consumer purchase patterns, retail product patterns and performance and consumer engagement via social media with TrendspotterTM, [they are]

artificial intelligence tool." The much-awaited taste charts by the Kerry Group have provided consumer insights globally. Global tastes include moringa, Manuka honey, miso, sambal, Japanese furikake, calamansi limes, turmeric, etc. The report also outlines increased tastes for "sensorial foods" such as sweet and spicy dishes, carbonated beverages, and exotic fruits that give interesting textures and tingles to the non-natives' tongues (https://www.specpage.com, 2021).

With Western Visayas considered a possible focus of food tourism, the Department of Tourism (DoT) is gearing up to promote the region's farms as possible destinations. During his visit to Iloilo City Friday for the fifth and last leg of "Kain Na! Culinary and Travel Festival," Edwin R. Enrile, Tourism Undersecretary for legal and unique concerns, said Panay's food and farm products are varied and usually fresh from the farm or the sea. "When you think about Western Visayas and Iloilo, you always think about why people come here — the cuisine and the culture. You have the freshest ingredients, seafood, and all that," Mr. Enrile said in an interview Friday (Santiagudo, 2019, par. 1-4).

Since the value of food is highly evaluated in modern society, its appearance is increasingly linked with travel experiences. Under its growing significance to tourist experience, food has become a factor in deciding their overall satisfaction with the trip (Nield et al., 2000; Rimmington & Yuksel, 1998, as cited in Hall et al., 2003).

Food tourism has become one of the essential tourism niches in recent years. It is widely understood that travelers can get a true sense of a destination's heritage, culture, and traditions through food. European tourists are increasingly keen to enjoy immersive and authentic experiences while traveling away from home. Showcasing local cuisines and involving local communities offer multiple opportunities for local operators to develop a unique food travel product in their destination (https://www.cbi.eu, 2021, par. 1).

Roxas City in Capiz is dubbed the "Seafood Capital of the Philippines" due to the abundance of fishing grounds in the area and its contribution to the aquaculture industry. Its delicious seashells, crabs, oysters, and scallops are all you want to eat in the city. However, there is more than just seafood in Capiz. A town 40 kilometers away from Roxas is known for its famous street delicacy. In the municipality of President Roxas (Luton-lutod), you will discover puyoy, a delicacy of freshly grilled eel on a barbecue stick (Gonzales, 2020, par. 1-2)

The literature above indicates the significance of gastronomic tourism in attracting tourists to the destination, as food plays a vital role in the tourists' decision to choose a destination. It also signifies the rise of slow tourism through slow foods as it focuses on providing and consuming local cuisines and promoting sustainable food production and distribution principles. The study will result in locally-produced foods and beverages for culinary tourism that will also promote slow food and slow tourism in Roxas City by utilizing Kerson fruit as the main ingredient. The products developed in this study may put Kerson fruit's upcoming new ingredient trends in food service.

Kerry Global Taste Charts 2021, a global taste chart used by food service in developing new products, indicates the outlines of an increase in tastes for "sensorial foods" such as sweet and spicy dishes, carbonated beverages, and exotic fruits that give interesting textures and tingles on the non-natives' tongues. Kerson fruit is considered a strange fruit because of the lack of its utilization, as it is commonly known as a children's playtime fruit and a bird's fruit. Also, as observed in the above literature, aside from being known as the seafood capital of the Philippines, there need to be more culinary products that will enhance the appeal of Roxas City as a culinary tourism destination.

METHODOLOGY

This study used the descriptive method of research. The respondents of this study were the accredited tour guides in Roxas City, owners of accredited travel agencies in Roxas City, and the staff and guests of Palina Greenbelt Ecopark. They were the chosen respondents because they were the ones that provided the data needed for this study. Of the respondents, two accredited tour guides and two owners/managers of accredited travel agencies from Roxas City, 12 staff, and 36 guests of Palina Greenbelt Ecopark were respondents to this study, a total of 50 respondents. This number of respondents was due to the limited raw materials needed to produce the products for testing and evaluation and

the resurgence of cases of the COVID-19 pandemic. The sampling technique used in this study is non-probability sampling, a convenience sampling. The data were gathered using convenience sampling. This sampling technique was used since the study is descriptive research requiring quantitative data. Also, this was the technique used since the availability of the respondents is a concern in this study since it was conducted during the pandemic. The data needed for the study were gathered using face-validated instruments, adopted and modified from UTT, BAFT, B.Sc. Food Science and Technology, Student Project for PROJ2005 Capstone, 2012 for acceptability, potential demand, and sustainability. The research instrument uses a Likert scale to derive the correct answer from the respondents needed in this study. The statistical tools used in the study were mean, standard deviation, and linear regression.

FINDINGS

Most preferred food products from Kerson (Mutingia Calabura Linn.) fruit

Among the food products from Kerson fruit, Kerson Ice Cream and Kerson Bread are the most preferred food products. This is due to their better appearance, aroma, taste, and texture.

Table 1 Most Preferred Food Products from Kerson Fruit

Preference	N	Mean	Description	SD
Kerson Ice Cream	50	4.92	Very High	0.54
Kerson Bread	50	4.08	Very High	3.36
Kerson Cookies	50	3.96	High	3.38
Kerson Patty	50	3.56	High	1.88
Kerson Siomai	50	3.54	High	3.12

Note: The most preferred products from Kerson fruit were measured using the following scale on VL: 1-1.50; L: 1.51-2.50; M: 2.51-3.50; H: 3.51-4.50; VH: 4.51-5.0

Potential of food products produced from Kerson fruit (M calabura Linn.) for the development of gastronomic tourism in Roxas City

Acceptability. On the acceptability of the products from Kerson fruit in terms of appearance, aroma, taste, and texture, the acceptability ratings of Kerson Ice Cream, Kerson Bread, and Kerson Cookies are very high. For aroma, Kerson Ice Cream, Kerson Bread and Kerson Cookies are very high. Kerson Patty and Kerson Siomai are high. For taste, Kerson Ice Cream, Kerson Bread and Kerson Cookies are very high. Kerson Patty and Kerson Siomai are high. For texture, Kerson Ice Cream, Kerson Bread and Kerson Cookies are very high. Kerson Patty and Kerson Siomai are high.

According to Kumar and Kapoor, when purchasing vegetarian food products, consumers consider three main types of attributes: credence attributes (e.g., nutritional value, freshness), search attributes (e.g., variety, size, and color), and experience attributes (e.g., taste, odor). Natila et al. (2019) said that sensory evaluation such as taste, texture, aroma, and color as the basis for acceptance. According to Piqueras-Fiszman and Spence (2015) , sensory characteristics of food such as taste, texture, aroma, and appearance have distinct and influential effects on food acceptability.

Table 2.a. Acceptability

Descriptives	Kerson Ice Cream	Kerson Bread	Kerson Cookies	Kerson Patty	Kerson Siomai
Appearance					
Mean	4.92	4.72	4.72	4.36	4.32
Description	Very high	Very high	Very high	Very high	Very high
SD	.27	.45	.54	.85	.89

Descriptives	Kerson Ice Cream	Kerson Bread	Kerson Cookies	Kerson Patty	Kerson Siomai
Aroma					
Mean	4.80	4.64	4.52	4.06	4.28
Description	Very high	Very high	Very high	High	High
SD	.49	.56	.58	.87	.87
Taste					
Mean	4.94	4.64	4.66	4.06	4.28
Description	Very high	Very high	Very high	High	High
SD	.24	.75	.56	1.11	.95
Texture					
Mean	4.80	4.64	4.58	3.96	4.18
Description	Very high	Very high	Very high	High	High
SD	.40	.75	.76	.88	.87

Note: The acceptability of products from Kerson fruit were measured using the following scale on VL: 1-1.50; L: 1.51-2.50; M: 2.51-3.50; H: 3.51-4.50; VH: 4.51-5.0

Demand

The data show that potential demand for Kerson Ice Cream, Kerson Bread, and Kerson Cookies is very high. For Kerson Patty and Kerson Siomai, the potential demand is high.

Market demand can be measured internationally, nationally, regional, local, or even smaller (smallbusiness.com, 2022). The aggressive expansion of retail chain operators, the booming tourism industry, the growing affluence of a "frequent snacking" culture, the liberalized retail trade landscape and to some extent the reduction in import duties. All these created opportunities and increased foodservice sales (Flanders Investment and Trade, Market Survey: Food Industry in the Philippines, 2019).

Table 2.b. Demand

Descriptives	Kerson Ice Cream	Kerson Bread	Kerson Cookies	Kerson Patty	Kerson Siomai
Mean	4.78	4.76	4.62	4.34	4.44
Description	Very high	Very high	Very high	High	High
SD	.14	.52	.57	.80	.79

Note: The potential demand of products from Kerson fruit was measured using the following scale on VL: 1-1.50; L: 1.51-2.50; M: 2.51-3.50; H: 3.51-4.50; VH: 4.51-5.0

Sustainability. The data in Table 2.c reveal that sustainability for Kerson Ice Cream, Kerson Bread and Kerson Cookies is very high. Sustainability for Kerson Patty and Kerson Siomai is high.

Consumers are increasingly concerned about the sustainability implications of food and demand alternatives to global supply chains. Indeed, recent surveys indicate that consumers are most concerned with affordability, nutrition, and food safety (Ahearn, 2016). Using ingredients that can combine sustainability, waste reduction, and maintain clean labels and transparency may help manufacturers weather shifting consumer's preferences over time (Nielsen, 2020).

Table 2.c. Sustainability

Descriptives	Kerson Ice Cream	Kerson Bread	Kerson Cookies	Kerson Patty	Kerson Siomai
Mean	4.98	4.72	4.64	4.34	4.46
Description	Very high	Very high	Very high	High	High
SD	.14	.61	.56	.75	.68

Note: The potential demand of products from Kerson fruit was measured using the following scale on VL: 1-1.50; L: 1.51-2.50; M: 2.51-3.50; H: 3.51-4.50; VH: 4.51-5.0

Challenges Faced by the Food Products from Kerson (Mutingia calabura Linn.) Fruit as a Potential Product for Gastronomic Tourism in Roxas City. "Lack of sustainable sources of Kerson fruits for the production of the food products" and the of "Lack of familiarity with Kerson fruits, particularly by a younger generation of tourists," are the major challenges.

The berries are sold in local Mexican markets and are very popular in the Philippines with children. In most cases, it is not a plant cultivated for its fruit, and they are usually gathered from spontaneous trees (Janick and Paull, 2008). This proves the absence of proper cultivation of Kerson tree that also indicates the difficulty of availability of the supply of the fruits for the production of these products.

Table 3. Challenges Faced by the Food products from Kerson (M calabura Linn.) fruit as a potential product for gastronomic tourism in Roxas City

Challenges Face by Food Products From Kerson Fruit	N	Mean	Description	SD
Lack of sustainable sources of fruits for the production of the products from Kerson fruit	34	4.82	Very high	.39
Lack of familiarity with Kerson fruits, particularly by the younger generation of tourists	34	4.29	Very high	.63
Hesitation on the part of the tourists to try unfamiliar products	34	1.38	Very low	.49
Difficulty in marketing the Products	34	1.18	Very low	.39
Overall Challenges face by Food Products	34	2.92	Moderate	.24

Note: The potential demand of products from Kerson fruit was measured using the following scale on VL: 1-1.50; L: 1.51-2.50; M: 2.51-3.50; H: 3.51-4.50; VH: 4.51-5.0

Food Products that could Affect the Potential of Kerson (M calabura Linn.) Fruit in Enhancing Gastronomic Tourism in Roxas City. The findings indicate that Kerson Cookies are "likely to affect" the potential of Kerson fruit in enhancing gastronomic tourism in Roxas City. Consequently, the hypothesis indicating that none of the food products could affect the potential of Kerson fruit in enhancing gastronomic tourism in Roxas City was rejected.

Kerson cookies as a new food product for gastronomic tourism could serve as an essential element in attracting tourists in Roxas City. Frochot (2003) considered food as the fundamental elements of the tourism product that draws the attention of tourists than the climate, accommodation, and captivating scenery of the destination. Likewise, Quan and Wang (2004) also believed that food and beverage are destination products that may act as a primary or secondary motivator.

Table 4. Food Products that could Affect the Potential of Kerson (*M calabura* Linn.) Fruit in Enhancing Gastronomic Tourism in Roxas City

Gastronomic Tourism	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig
(Constant)	4.128	3.067		1.3460	.185
Ice Cream	-0.367	0.61	-0.086	-0.601	0.551
Bread	-0.076	0.171	-0.065	-0.444	0.659
Cookies	-0.496	0.149	0.4645	3.326*	0.002
Patty	-0.132	0.184	-0.174	-0.72	0.475
Siomai	0.177	0.186	0.23	0.955	0.345

* $p<0.05$ significant @ 5% alpha level

IMPLICATIONS or CONCLUSIONS

1. Based on the findings, the most preferred product from Kerson fruit are the Kerson Ice Cream and the Kerson Bread. Therefore, Kerson Ice Cream and Kerson Bread could be a potential for enhancing gastronomic tourism in Roxas City.
2. Based on the findings, the potential of food products from Kerson (*M calabura* Linn.) fruits are very high because of their acceptability, demand and, sustainability.
3. Based on the findings, the challenges faced by the food products from Kerson (*M calabura* Linn.) fruit as a potential product for gastronomic tourism in Roxas City are moderate. Therefore, the challenges are not a major factor that could affect the potential of food products from Kerson fruit.
4. Based on the findings, Kerson cookies is the food product that could affect the potential of Kerson (*M calabura* Linn.) fruit in enhancing gastronomic tourism in Roxas City. Therefore, hypothesis is rejected.
5. A work plan for the enhancement of gastronomic tourism in Roxas City is needed.

Recommendations

1. On the most preferred products, Kerson Ice Cream and Kerson Bread, it is recommended to develop sustainable and environment-friendly packaging to have better marketability and competitiveness.
2. For products like Kerson Patty and Kerson Siomai, further improvement of the recipes are recommended to make their acceptability, demand, and sustainability very high.
3. To have a consistent and stable supply of Kerson fruits for the production of Kerson food products, a plantation of Kerson trees must be developed. The college, through the researcher, may propose to the LGUS of the adopted communities, preferably in Roxas City, to establish a plantation of Kerson tree in their barangay as part of Farm Tourism products. An action plan for the development of the Kerson plantation and other farm tourism products will be presented to them after the conduct of this study.
4.
   a. An action plan for implementing full-scale production of all the food products from Kerson fruit must be developed and implemented together with an action plan for the Kerson tree plantation. See details of the action plan in the appendices. The developed action plan will be presented to the officers of identified barangays in Roxas City. The developed action plan or project proposal will be submitted to the Bureau of Agricultural Research of the Department of Agriculture and the Department of Science and Technology for funding and technological support for 2024-2025.
   b. In the meantime, an initial development plan for the possible source of Kerson fruits will also be proposed to the barangay while waiting for the source of funding and support. At least 20 households will be asked to plant and cultivate at least 2 Kerson trees as an initial source of Kerson fruit while waiting for the funding that might come from the Department of Agriculture or DOST.
   c. A proposal will also be submitted to the school heads in Roxas City, asking permission to plant at least 50 seedlings of Kerson on school

properties. This might provide an initial source of Kerson fruit to start the initial production of Kerson food products in Roxas City.

5. Develop a strategic plan for the enhancement of gastronomic tourism inn Roxas City.

Areas for Further Research

1. Product development of *Kamias* (Averrhoa bilimbi) for commercialization.
2. Product development of Cape Gooseberry (Physalis peruviana) for commercialization
3. Product development of Blue Ternate (Clitoria ternatea) for commercialization

STRATEGIC PLAN FOR THE ENHANCEMENT OF GASTRONOMIC TOURISM IN ROXAS CITY

ACTIVITIES	Expected Output	Persons/s involved	Resources/ Budget	Time Frame
Development of				
Development of gastronomic tour package and itinerary for Roxas City.	A well-developed gastronomic tour package and itinerary for Roxas City.	The proponent of this study Amazing Discoveries Travel and Tours	Laptop Projector Venue	1st to 2nd week of October 2022
Communicating and involving the establishments that are part of the destinations and provider of service in the developed tour package and itinerary of gastronomic tourism for Roxas City.	Establishments that are part of the destinations and provider of service in the developed tour package and itinerary of gastronomic tourism for Roxas City were communicated and engaged to be part of it.	Proponent of the study Amazing Discoveries Travel and Tours		3rd to 2th week of October 2022
Sending communication to the city and provincial tourism office and tour operators for the presentation of the developed gastronomic tour package and itinerary for gastronomic tourism in Roxas City.	Communications were sent to the city and provincial tourism office and tour operators for the presentation of the developed gastronomic tour package and itinerary for gastronomic tourism in Roxas City.	Amazing Discoveries Travel and Tours	Laptop	1st week of November 2022
Presentation of the developed gastronomic tour package and itinerary to the provincial and city tourism and to the tour operators in Roxas City.	Gastronomic tour package and itinerary presented and accepted by the provincial and city tourism and to the tour operators in Roxas City.	The proponent of the study City tourism officer Provincial tourism officer Tour operators in Roxas City	Laptop Projector Venue	3rd week of November 2022
Gastronomic tour package and itinerary test offering.	Gastronomic tour package and itinerary test offering were conducted.	Tour operators in Roxas City	C/O to tour operators	December 2022
Evaluation of the test offering of the gastronomic tour package and itinerary for its acceptability in the market	Gastronomic tour package and itinerary test offering where evaluated and acceptability were determined	Tour operators in Roxas City	C/O tour operators	1stweek of January 2023

ACTIVITIES	Expected Output	Persons/s involved	Resources/ Budget	Time Frame
Implementation and marketing of the gastronomic tour package and itinerary depending on the result of evaluation for it acceptability in the market.	Implemented and well marketed gastronomic tour package and itinerary for gastronomic tourism in Roxas City.	DOT province and city Tour operators of Roxas City	C/O DOT province and city Tour operators of Roxas City	February 2023

(*workplan template from TOURISM Guidebook FOR LOCAL GOVERMENT UNITS (Revised Edition))

Proposed Tour Package and Itinerary of Gastronomic Tourism for Roxas City

Tour Package Name: ROXAS CITY GASTRONOMIQUE, FARM, AND ECO-CULTURAL TOUR (Day Tour, Group of 10-15 pax)

▶Areas of destination:

- Roxas City Panublion Museum (8:00-8:30)
  - Activities
    - Visiting the museum
    - Picture taking
- President Manuel A. Roxas Ancestral House (8:45-9:15)
  - Activities
    - Visiting the house
    - Short presentation of the history and the features of the house
    - Picture taking
- Short stops and passing through the following areas (9:15-9:45)
  - Roxas City Hall
  - Halaran Plaza
  - City Fountain and Avenue Bridge (NCCA declared historical landmark)
  - Capiz Provincial Capitol
  - Luna Novicio Street
  - Villareal stadium
  - Provincial Park
  - Capiz National High School
  - Capiz State University
  - Lipunan market
  - Lee Liong Building
- FCU Historical Landmark and Gastronomic Delight (9:45-11:00)
  - Activities
    - Greeting and welcoming of the tourists thru a cultural show
    - Brief presentation of the history of Filamer Christian University
    - Serving of food products made from Kerson fruit, Kamias (Cucumber Tree) and Blue Ternate at the University Café
    - Buying of food products made from Kerson fruit, Kamias (Cucumber Tree) and Blue Ternate
    - Picture taking at the oldest building of the university and the Marker
- Palina/Cadimahan River Gastronomic Cruise (11:15-2:00)
  - Activities
    - River cruise in a floating cottage/raft
    - Lunch while on a cruise (Fresh seafoods will be served)
    - Demo and hands-on crab tying and crab meat flaking
    - Cooking demo and hands-on of crab leche flan and crab relleno
    - Wellness services while on a cruise such as massage, manicure and pedicure and foot spa
- Capiz Grape Sanctuary at Barangay Navara, Ivisan (2:30-3:30)
  - Activities
    - Fruit picking (depending on the availability)
    - Picture taking
    - Short presentation of grape farming (for group guests)
    - Buying grape seedlings/cuttings (depending on the availability)
- Sacred Heart of Jesus Shrine (4:00-4:30)
  - Activities
    - A short meditation for those who are Catholics
    - Picture taking
- Banica Ugahan (4:45-6:00)
  - Activities
    - Buying dried seafood pasalubong
- Dinner at Bay Bay Seafood Restaurants (6:30 PM onwards)

REFERENCES

Adeyinka-Ojo, S.F., Khoo-Lattimore, C. (2013). Slow food events as a high yield strategy for rural tourism destinations: The case of Bario, Sarawak, Worldwide Hospitality and Tourism Themes, 5(4), forthcoming.

Agarwal, T. (2022, May 30). Standard Deviation Examples. WallStreetMojo. https://www.wallstreetmojo.com

Ahearn, C. A. et al. (2016). Big data's potential to improve food supply chain among older people. https://journals.sagepub.com

Banerjee, M. (2021, February 6). Food Tourism: *An effective marketing tool for Indian tourism industry. International Journal of Science Technology & Management. 4,2*. http://www.ijstm.com

Basque Culinary Center. (2021). https://www.bculinary.com

Beers, B. (2020). Regression definition. https://www.investopedia.com

Bhasin, H. (2018, March 12). Adoption theory – Theory of product adoption. Marketing91. https://www.marketing91.com

Boniface, P. (2003). Tasting tourism: Travelling for food and drink. https://doi.org

Capone, R., Bilali, H. E., Debs, P., Cardone, G. (2014). Food system sustainability and food security: *Connecting the dots*. DOI:10.12691/jfs-2-1-2.

Choe, J. Y. & Kim, S. K. (2018). Effects of tourists' local food consumption value on attitude, food destination image, and behavioral intention. *International Journal of Hospitality Management* 71:1-10.

de Albuquerque Menguel, C. R. et al. (2018). The role of a high-quality restaurant in stimulating the creation and development of gastronomy tourism. *International Journal of Hospitality Management*. DOI:10.1016/j.ijhm.2018.10.018.

De Barros, S. F. & Cardoso, M. A. (2016). Adherence to and acceptability of home fortification with vitamins and minerals in children aged 6 to 23 months: a systematic review. *BMC Public Health 16*, (299).

de la Barre, S. & Brouder, P. (2013). Consuming stories: *placing food in the Arctic tourism experience. Journal of Heritage Tourism 8*(2-3):213-223. DOI:10.1080/1743873X.2013.767811.

De Salvo, P. & Calzati, V. (2018). Slow Tourism: *a theoretical framework*. DOI: 10.4324/9781315686714-7.

De Vera, A. (2019, November 24, 11:51 AM). DOT to promote culinary tourism. https://mb.com.ph

Denning, S. (2014, September 10). What's the future of the food industry?. https://www.forbes.com

Department of Tourism. (2017). Tourism guidebook for local government units (Revised Edition)

Dumaraos, G. R. R. (2021, July 31). D.O.T. reignites local food tourism as culinary trips reopen. https://businessmirror.com.ph

Durand, G., Heath, E., Alberts, Nic. (2003). The role of local and regional food in destination marketing. *Journal of Travel & Tourism Marketing, 14*(3):97-112. DOI:10.1300/J073v14n03_06.

Eleazar, N. P. (2012, October-December).: Promoting less- known Pinoy fruits. *Bureau of Agriculture Research and Development Digest, 4*, (3).

Endrizzi, I., Torri, L., Corallaro, M. L., Dematte, M. L., Aprea, E., Charles, M., Biasoli, F., Gasperi, F. (2015). A conjoint study on apple acceptability: *Sensory characteristics and nutritional information. Food Quality and Preference 40*: 39–48. DOI:10.1016/j.foodqual.2014.08.007.

FLANDERS INVESTMENT & TRADE MARKET SURVEY. (2018-2019). Philippine food industry. https://www.flandersinvestmentandtrade.com

Frochot, I. (2003). An analysis of regional positioning and its associated food images in French tourism regional brochures. *Journal of Travel & Tourism Marketing 14*(3):77-96. DOI:10.1300/J073v14n03_05.

Gaitán-Cremaschi, D. Klerkx, L., Duncan, J., Trienekens, J. H., Huenchuelo, C., Dogliotti, S., Contesse, M. E., Rossing, W. A. H. (2018). Characterizing diversity of food systems in view of sustainability transitions. *A review. Agronomy for Sustainable Development* 39, 1.

Glavanic, I. (2015, April 10). How to estimate market demand for a product?. https://parcusgroup.com

Gonzales, K. (2020). 4 reasons to eat Puyoy: Capiz's extraordinary street food. https://www.pinned.ph

Grandcourt, E. (2019). A tour of African gastronomy. https://www.e- unwto.org

Grant, B. L. (2021). What is a Panama Berry: Caring for Panama Berry trees. https://www.gardeningknowhow.com

Herrera, C. F., Herranz, J. B., & Arilla, J. M. (2012). Global report on food tourism. https://www.e-unwto.org World Tourism Organization UNWTO

http://www.businessdictionary.com

https://doi.org/10.1080/16070658.2018.1449377.
https://www.tandfonline.com
https://en.wikipedia.org/wiki/Muntingia
https://smallbusiness.chron.com
https://www.cbi.eu (2021). What are the opportunities on the European Food Tourism market?
https://www.gmanetwork.com. (2013, April 10). Culture, cuisine and Capiz: Inside Roxas City, Capiz
https://www.lifehack.org
https://www.mobility-academy.eu/mod/book
https://www.specpage.com/culinary-tourism-at-home-2021
Janick, J., & Paull, R. E. (2008). The encyclopedia of fruits and fruits: *Valuing fruits and nuts*. DOI:10.1525/bio.2009.59.8.19.
Kapoor, S. & Kumar, N. (2019). Does packaging influence purchase decision of food products? A study of young consumers of India. *Academy of Marketing Studies Journal 23* (3).
Lee, Y., Kim, S., Seo, M., Hight, S. K. (2014). Market orientation and business performance: Evidence from franchising industry. *International Journal of Hospitality Management 44*:28-37. DOI:10.1016/j.ijhm.2014.09.008.
Mahmood, N. D., Nasir, N, L, M., Rofiee, M. S., Tohid, F. M., Ching, S.M., The, L. K., Salleh, M. Z., Zakaria, Z. A. (2014). Muntingia calabura: A review of its traditional uses, chemical properties, and pharmacological observations. *Pharamceutical Bilogy, 52*. https://doi.org
Maina, J. W. (2018). Analysis of the factors that determine food acceptability. *The Pharma Innovation Journal 7*(5): 253-257.
Mavcure. (2018) 18 Health benefits ff Aratilis (Kerson fruit) you should know. https://mavcure.com/aratilis/
Moira, P., Mylonopoulo, D., Kondoudaki, A. (2017). The Application of Slow Movement to Tourism: Is Slow *Tourism a New Paradigm?. Journal of Tourism and Leisure Studies 2*(2):1-10. DOI:10.18848/2470- 9336/CGP/v02i02/1- 10.
Momblan, G. (2019, December 7). DOT promotes Panay's farm, culinary tourism. https://www.pna.gov.ph
Morton, J. F., & Dowling, C. F. (1987). Fruits of warm climates. Miami. FL : J.F. Morton
Natila, S. (2017). Acceptability of a moringa-added complementary soft porridge to caregivers inHammanskraal, Gauteng province and Lebowakgomo, Limpopo province, *South Africa. South African Journal of Clinical Nutrition 32*(3)
Nesbitt, T. (2021, February 10). Culinary travel experiences Around the World. https://solotravelerworld.com
Nurwitsari, A. & Ayuningsis, S. F. (2019). Development of traditional culinary tourism potential for tourist attraction in Lombok. *Advances in Economics, Business and Management Research, 28*.
Peura-Kapanen, L., Jallinoja, P., Kaarakainen, M. (2017). Acceptability of convenience food among older people. https://doi.org/10.1177/2158244017698730.
Privitera, D. (2020). A view on culinary tourism – case study of Catania, Italy. *GEOGRAPHY AND TOURISM, 8*,(1).
Psarros, M. (2010). Destination marketing and the "food" element: *A market overview*. https://www.toposophy.com
Quan, S. & Wang, N. (2016). Towards a structural model of the tourist experience: An illustration from food experiences in tourism. https://www.academia.edu
Rajesh, D. K. (2014). Qualitative and quantitative phytochemical analysis in four pteridophytes. *International Journal of Pharmaceutical Sciences Review and Research, 27*(2), 408-412
Santiagudo, E. R. S. (2019, December 11). DoT positioning Western Visayas for food tourism. https://www.bworldonline.com
Severo, J. (2019, June 5, 2:40pm) Iloilo teen reportedly discovers aratiles' potential to cure diabetes. https://www.philstar.com
Shalini, D. & Duggal, S. (2014). A review on food tourism quality and its associated forms around the world. *African Journal of Hospitality, Tourism and Leisure 4* (2).
Singh, D. & Maharaj, M. (2014). Sensory evaluation as a tool in determining acceptability of innovative products developed by undergraduate students in food science and technology at the university of Trinidad and Tobago. *Journal of Curriculum and Teaching 3*(1). DOI:10.5430/jct.v3n1p10.
Steinmetz, R. (2010). Food, Tourism and destination differentiation: *The Case of Rotorua, New Zealand*. https://core.ac.uk/download/pdf/56361843.pdf
Stuart Jr., G. U. (2019). Philippine medicinal Plant: *Aratiles*. http://www.stuartxchange.org/Aratiles
Su, Y. (2015, February 4). Reflections on local specialties and gastronomic tourism. *Chinese Studies, 4* (1).
UNWTO. (2012). Global report on food tourism. https://www.e- unwto.org

UNWTO. (2012). Guidelines for the development of gastronomy tourism. https://www.e-unwto.org

UNWTO. (2017, May 7). 3rd UNWTO forum on gastronomy tourism. https://webunwto.s3.eu-west-1.amazonaws.com

UNWTO. (2021). World forum on gastronomy tourism. https://webunwto.s3.eu-west- amazonaws.com https://www.unwto.org