Chapter II

REVIEW OF RELATED LITERATURE AND STUDIES

This chapter presents a comprehensive examination of pertinent literature from both international and domestic sources. The researcher collected and analysed these sources to acquire additional information regarding the construction of the study. It encompasses the theoretical and conceptual framework, the synthesis state of art, and the identification of the research's contribution in addressing a specific research gap.

Foreign Literature

The standardization practices of food and beverage businesses are called “standard recipe”. Standard recipes are a list of the steps in preparing a meal and the ingredients used in the meal. With this standardization, the content and preparation of the meal, as well as its portion, presentation and cost are determined. The resulting standard product provides customer satisfaction and continuity, while also bringing advantages such as effective cost control, hygiene habits and waste prevention attitudes. Standard recipes applied to local dishes ensure sustainability while eliminating personnel dependency. In addition, since it is known exactly how much of which product is needed in purchasing transactions, it prevents complexity and saves time in inventory control and record keeping. (Sackes, E., 2023)

The aforementioned article above is related to the present study because standard recipes ensure consistency in taste, portion size, and presentation which is important in making a new innovative product. By applying standard recipes, the researchers can ensure that the innovative patties exact, measurable amount of ingredients and the method of preparation needed to consistently produce a quality and quantity product. Implementing these practices in the present study it will help the researchers work efficiently because all ingredients and preparation details are accurately stated. Precision saves time, prevents wastage, and eliminates guesswork and human errors.

According to Turner, S., (2024) Assessing the quality of the poultry before using it for the patties is a crucial first step. Look for freshness indicators such as color, texture, smell, and date labeling to determine if the meat is safe to consume. By starting with high-quality ingredients, you can set yourself up for success. From assessing poultry quality to utilizing the right packaging materials, we will cover every step of the process. When preparing the patties for storage, make sure to use proper packaging materials and season them to your liking. If you're storing the patties in the refrigerator, ensure that the temperature is set at or below 40°F (4°C) and consume them within 1 to 2 days. For longer storage, freezing is the way to go. Properly package the patties to protect them from freezer burn and store them for up to 3 months. Lastly, consider best practices for retaining taste and texture when reheating, such as allowing the patties to rest, adding toppings after reheating, and serving on fresh buns.

The cited article above is connected to the current study because the article emphasizes the importance of assessing the quality of ingredients, using proper packaging and storing. By following the article above the researchers can ensure the freshness and quality of these seafood ingredients will be important for achieving a successful final product. Proper storage, techniques, such as maintaining appropriate temperatures is important to stop the bacteria from spreading and to avoid food poisoning. Applying these guidelines will help the researchers ensure a burger patty safe to consume and retain their desirable qualities during storage and cooking.

According to Gökoğlu, N. (2021) Shellfish is a broad term that covers various aquatic mollusks, crustaceans and echinoderms that are used as food. They have economic and ecological importance and have been consumed as food for centuries. Shellfish provide high quality protein with all the dietary amino acids essential for maintenance and growth of the human body. Shellfish are a major component of global seafood production, with shellfish aquaculture rapidly growing in recent years. There are many different processing methods used across the world. Shellfish are very perishable foods and must be preserved just after catching or harvesting. This makes the preservation of seafood a critical issue in terms of quality and human health. Shellfish Processing and Preservation is the first reference work to focus specifically on shellfish, providing comprehensive coverage of the production methods, biological makeups and preservation methods of all major shellfish species.

The aforementioned article above is related to the present study because the article discussed into various preservation methods. These methods are important for maintaining the quality and safety of shellfish products. Knowing about these methods can help the researchers create burger patties that retain the freshness and flavor of pen shell and mussels.

According to Abraham, J., (2022) The new dimensions of food packaging are influenced by consumer preferences for food safety, innovations, and convenience. In an era of technological advances, food packaging has evolved into smart packaging. Both active and intelligent food packaging as an important component of smart packaging provides the customers with an optimum food product experience. Active food packaging aims at improving the shelf-life of the product by addition of certain components into the package. While intelligent packaging helps the food product to navigate the product cycle until it reaches the consumer. Intelligent food packaging includes tools that help during the product cycle, for example, indicators, RFID tag, barcode labels, and biosensors. A few of the different types of indicators used in intelligent food packaging include time-temperature indicators, leak indicators, freshness indicators, gas indicators, and pH indicators. Advantages of intelligent food packaging include monitoring the internal environment of the package, monitoring the logistics of the product, protection from theft, improving pathogen detection, increased product value, reduction in food wastage while extending the shelf life and providing convenience to the consumer while expanding market.

The article above is related to the current study because the article highlights the importance of ensuring the freshness and quality of ingredients. Just like with poultry, we need to check the freshness of our seafood ingredients through indicators like smell and texture to ensure safety and quality. Using suitable packaging and maintaining the right storage temperatures will help preserve the patties' quality over time. This process ensures that our seafood patties stay fresh and delicious, even when stored for later use.

The incorporation of seafood in the daily human diet would be beneficial in providing most of the essential nutrients. This chapter discusses in brief the extent of available nutrients and a variety of human health endpoints that may be influenced by nutrients available in seafood. Seafood is categorized as a nutrient-dense food group of the human diet with respect to their chemical composition. Seafood is comprised of a significant proportion of high-quality, easily digestible proteins that are rich in essential amino acids. Important vitamins (A, D, and B) and minerals (iodine, selenium, calcium, zinc, phosphorus, iron, copper, manganese, etc.) available in seafood also contribute to a healthy diet. Seaweeds are low in fat, low in calories, and rich in essential minerals, vitamins, and protein. The mineral content of seaweeds is very significant and is likely to explain many of their beneficial effects on health. (Jayasekara, C. et al. 2020)

The aforementioned article above is connected to the present study because the article discusses the nutritional value of seafood and its potential health benefits. The researchers aim to enhance the nutritional value of the patties by using ingredients like pen shells and mussels. The article highlights

that seafood is a good source of essential nutrients, which aligns with of the researcher's goal of creating a healthier burger option. By using seafood in the patties, the researchers hope to provide consumers with a more nutrient food choice that still offers the taste and texture of a traditional burger.

Local Literature

The West Philippine Sea (WPS) is home to a diverse marine ecosystem that comprises an estimated 30% of the coral reef in the country with its Kalayaan Group of Island. It also contributes to around 27% of the country's commercial fisheries production, which serves as a crucial source to support the country's economy and food security. The whole marine ecosystem has structures and functions that play a key role in the biogeochemical cycling of the life's building blocks (nitrogen, carbon, oxygen, silica, and sulfur) and the overall biological productivity, all of which leads to ecological production of ecosystem services such as pollution control through carbon sequestration, habitat for many marine species, and shoreline stabilization and erosion control, among many others. (Rayo, J. F., 2022)

The article above is related to the current study because it highlights the economical contribution of marine resources. The article also states about the status where the West Philippine Sea is a place to source the raw materials. The researchers needs a lot of choices of places to source their raw materials for their efficient production. And according to the article that the marine sources

contributes to economical rate of the country which may also lead to the high demand of the product of the researchers.

MANILA, Philippines — The Bureau of Fisheries and Aquatic Resources (BFAR) reported that four areas have exceeded the permissible limit for Paralytic Shellfish Poison, commonly known as toxic red tide, as of May 3. The following areas have been identified as the sites where toxic red tide has been detected: coastal waters of Dauis and Tagbilaran City in Bohol; Matarinao Bay in Eastern Samar; Dumanquillas Bay in Zamboanga Del Sur; and coastal waters of San Benito in Surigao Del Norte. "All types of shellfish and Acetes sp. or alamang gathered from the areas mentioned above are NOT SAFE for human consumption," BFAR said. Other seafoods like fresh fish, squids, shrimps and crabs, can still be eaten if they are thoroughly washed and their internal organs are removed, the bureau added. Toxic red tide is caused by harmful algal blooms, which can result to severe health problems when shellfish and other seafood are contaminated. (Daguno-Bersamina, K., 2024)

The aforementioned article above is connected to the present study because the article is awareness about shellfish that has a paralytic shellfish poison which is harmful to eat. Unsafe raw materials can affect the production and the safeness of the product. The researchers aim to produce a safe product to avoid food poisoning.

One of the issues hounding the fisheries sector is spoilage, which happens between transport from fishing boats to ports and markets, Mr. Marcos

said in a video interview after presiding over a meeting with officials of the Agriculture department and the Bureau of Fisheries and Aquatic Resources (BFAR), among other government agencies. “The solution there is to put up cold storage facilities where fish catch are brought in,” the President said in the video, speaking mainly in Filipino, based on a press release from the Presidential Communications Office (PCO). He said the country plans to build 11 more cold storage facilities on top of those already being constructed in ports in the cities of General Santos and Cagayan de Oro in southern Philippines. The location of the other planned facilities, which are expected to be operational by the end of the year, was not specified. (Flores, H. 2023)

The article above is related to the current study because it is news about building cold storage facilities. The cold storage facilities will help the storage of aquatic resources. The researchers can benefit from the cold storage method to store their raw materials to avoid spoilage.

In 2021, the total shellfish production reached 64,443.94 MT, wherein 40,736.89 came from Oyster production and the remaining 23,707.05 MT was from Mussels production. Region III was the leading producer of shellfish in 2021 with a total of 25,068.49 MT, with oyster being its primary contributor accounting for 99.80% of its shellfish production. The next largest producer of shellfish was Region VI with 19,984 MT, in which mussel production is at 9,098.80 MT, the highest among the regions. At current prices, the shellfish value of production reached PhP 1.53 billion in 2021, wherein 59.65% came from oyster production while mussel production contributed 40.35% to the total shellfish value of

production. The highest contributor to the value of production of oyster was Region III with 74.12% share. Meanwhile, Region IV-A showed the largest contribution to mussel value of production at 49.49%. (Albaladejo, M. A. A., 2021)

The aforementioned article above is connected to the present study because it discussed the production of shellfish. Wherein one of the main ingredients is the largest shellfish that is produce in Region VI. The article's information helps the researcher on the sourcing of raw materials. The large production of shellfish may also lead to the continuous production of the researchers of their own product.

Packaging is a useful and effective instrument to establish and strengthen one's brand identity. For one, it differentiates the brand from the other players in the field. Clearly, Godiva isn't Snickers because it's more luxurious based on the way it's presented and contained. Apart from market positioning, it also speaks of the brand's values, which inevitably allows the consumer to determine whether he is aligned with it or not. Masa Bakery Manila and Agimat Gin both wanted their packaging to pay tribute to the roots of their products, and so they used elements that make up the Philippines when designing their packaging. The results are stunning visuals that make the brands not only stand out from the pack but promote a sense of local pride as well. (Comsti, A. 2022)

The article above is related to the current study because it gives valuable information about packaging of products. The researcher can benefit from the

article to create a presentable and quality packaging. The packaging leaves a mark to the consumer leading to increase brand name or product name.

Foreign Studies

The study by Othman, S. H. et al., (2022). entitled “Formulation of crispy chicken burger patty batter: Properties and storage qualities.” This study formulated the batter systems for crispy chicken burger patties using wheat flour-based batter and rice flour-based batter with the ratios of 2:2:1:1 and 2:1:2:1 (wheat flour/rice flour: corn flour: crispy flour: spicy flour). The crispy chicken burger patties were evaluated in terms of proximate compositions (moisture, ash, fat, protein, and carbohydrate contents) and sensory analysis. Crispy chicken burger patties made from rice flour-based batter with a formula ratio of 2:2:1:1 were found to exhibit the lowest moisture and fat compositions but the highest protein composition. The sensory properties were evaluated using the 9-point hedonic scaling method in terms of overall acceptability, appearance, taste, crispness, juiciness, and color, which revealed that exhibited the best acceptability scores for all attributes. Then, the storage qualities of crispy chicken patties packed using different types of packaging materials (low-density polyethylene, medium-density polyethylene, and high-density polyethylene) and stored at different temperatures (−18, 4, and 25 ℃) for 12 days were investigated in terms of color and texture.

The study has a relevance to the present study because examines the potential of effective packaging it is a relevant to the present study as packaging

plays an important role. Proper packaging is essential for preserving and safeguarding the product, attracting customers, and educating them about the product also extends the shelf-life of food items. By knowing the effective packaging the researchers has a solution for effective packaging. Understanding the effective packaging can significantly contribute to the goal of the researchers to create a presentable product.

According to the study of Chong, C.-C. et al., (2023) Sardine fish patty is a processed seafood product that easily spoiled because of oxidation. Oregano, cloves, cinnamon, turmeric, and green tea contain antioxidant properties that could preserve the fish patty. This study aimed to incorporate these ingredients into sardine fish patties and investigate their effects on the physicochemical properties, sensory evaluation, and lipid oxidation of the patties. The fresh sardine patties were treated with 0.5% of oregano cloves cinnamon turmeric or green tea before being cooked, cooled and chill-stored for 12 days. No significant effects of the treatments were observed on moisture content, cooking yield, and shrinkage of the patties. The incorporation of turmeric significantly ($P<0.05$) affected all colour parameters on the patties with turmeric. Although green tea showed slightly increased values in some texture profiling parameters, the green tea also showed positive acceptability regarding sensory evaluation for most of the eating quality parameters.

The aforementioned study is relevant to the current study because it examines preserving sardine fish patties through adding natural antioxidants like oregano, cinnamon, turmeric and green tea to prevent oxidation over time.

Knowing about the study helps the researchers to enhance seafood products' quality and shelf life through adding natural antioxidants. By incorporating green tea into fish patties will help the researchers because the study provides an example of a similar approach to maximize sensory qualities and preservation in bivalves found in burger patties.

According to study of Ilic, J. et al., (2023) entitled "Beef and plant-based burgers' mastication parameters depend on texture rather than on serving conditions". Previous studies dealing with plant-based meat analogs confirmed the potential of oral processing methods to identify options for improving those products. Knowing that sensory perception can be influenced by adding condiments, this short communication aimed to investigate the texture and oral processing of four plant-based burger analogs and a beef burger when consumed in portions or as part of model meals with buns and sides. Texture profile analysis indicated that beef burgers and analog E were the toughest. Two analogs (B and S) showed textures close to beef, while one (analog D) displayed significantly lower values for hardness, toughness, cohesiveness, and springiness. The instrumental data was only partly reflected in the mastication parameters.

The previously mentioned study is relevant to the current study because it analyzed the textures of plant-based burger patties compared to beef using profiling and examined how oral behaviors like chews and swallows it will enter the sensory evaluation under the stamen of the problem . Knowing how attributes like cohesion, springiness, hardness and toughness varied between patties will

help the researchers evaluate the sensory evaluation. The study also considered how factors like consumption time, chew count and swallow count changed knowing all the factors will help the researchers to create a burger patties that will be exact like the traditional burger patties.

The study carried out by Zhang, Y. et al., (2024) entitled “Exploring relationships between juiciness perception, food and bolus properties of plant-based meat analogue and beef patties”. Plant-based meat analogues often lack sensory juiciness, limiting their consumer appeal. This study aimed to better understand juiciness and texture perception of plant-based meat analogue and beef patties by linking food and bolus properties to sensory properties. Commercially available Plant-based meat analogues and beef patties were cooked to four core temperatures (60, 70, 80, 90 °C). Juiciness intensity decreased significantly and strongly with increasing core temperature (rank-rating test), so that series of patties covering a broad range of juiciness were obtained from the same raw materials. Rate-All-That-Apply profiling revealed that with increasing juiciness intensity Plant-based meat analogues patties were perceived less dry and fattier, whereas beef patties were perceived less dry, less hard, less chewy, and fattier and more tender. Juiciness intensity correlated strongly with the properties and composition of the samples.

The aforementioned study is relevant to the current study because it discussed the juiciness perception of plant-based meat determining sensory properties. Knowing the formulation and processing of burger patties the researchers can gain insight and help to enhance consumer satisfaction and

acceptance. The study helps the researchers understand the consumer satisfaction, acceptance and sensory properties such as juiciness and texture is crucial for creating palatable and appealing products

The study of Fajar, B. et al., (2021) of “Application of High-Frequency Defrosting, Superheated Steam, and Quick-Freezing Treatments to Improve the Quality of Seafood Home Meal Replacement Products Consisting of the Adductor Muscle of Pen Shells and Common Squid Meat”. The study developed a new seafood home meal replacement product containing the adductor muscle of the pen shell and common squid meat via high-frequency defrosting, superheated steam, and quick freezing. Test home meal replacement products were produced by mixing defrosted and roasted adductor muscle of the pen shell, common squid meat, and sauce in ratios of 27.5, 27.5, and 45.0% (w/w), respectively, followed by quick freezing at −35 °C in a polypropylene plastic bowl covered with a plastic film. The chemical characteristics, nutritional quality, microbial and sensory properties, and shelf life of the product were examined.

The previously mentioned study is relevant to the current study because it discussed how seafood quality improved using high-frequency thawing and rapid freezing. By applying the study mentioned the researchers can gain insight on how to store the shellfish this relates to the current study under the storing. Understanding advanced methods may help the researchers create quality burgers and can improve recipes. The researchers can gain production techniques that enhance qualities essential for achieving customer satisfaction

Local Studies

The Current Research by Cornez del Rosario, H. C. et al., (2023) entitled "Microbiological and Physico-Chemical Quality of Green Mussels Perna viridis along the Supply Chain in Bacoor City, Cavite, Philippines". The study was utilized to assess pH and drip loss in mussel and pen shell burger patties over time, as well as to examine the presence of foodborne microorganisms. The study found that dangerous bacteria, including Salmonella, Escherichia coli, and Vibrio spp., were significantly present, especially at the locations of origin. Microbiological analyses revealed that the aerobic plate count increased and exceeded standard limits along the entire supply chain. The overall coliform levels were still within permissible bounds, although E. Coli levels increased across the supply chain, surpassing what is safe to eat raw. Additionally, harmful bacteria like E. At several stages of the supply chain, Salmonella and E. Coli were found, raising possible safety issues. In order to guarantee product safety and quality in the framework of my research project,

The study has a relevance to the present study because it establishes a link between burger patties made from pen shell and mussels and prior research that examines the presence of pathogens and pH fluctuations. It underscores the importance of monitoring microbiological and physico-chemical changes in seafood burger patties to guarantee their safety and quality at every stage of the supply chain. Addressing these concerns will help the researchers for upholding consumer trust and preserving the integrity of the product.

According to the study of Ordinario, J. et al., (2023) entitled “The Status, Trends, and Limitations of Philippine Mollusk Production and Trade Based on Available Databases and Publications”. Mollusk trade is vital in many coastal areas and island communities throughout the Philippines because it provides livelihoods, food, and incomes to millions of Filipinos via fisheries (e.g., shellfish fishing and gleaning), shell craft, arts, shell trading and collections, and aquaculture. However, the assessments of the national trends and status of mollusc production and trade in the Philippines are largely non-existent in peer-reviewed literature. The main purpose of this paper is to present and evaluate the status and trends of traded Mollusks in the Philippines based on available online databases and a systematic review of published literature. To date, available databases on Philippine mollusk trade showed an initial increase in traded volume (the 1970s to 2006) but decreased afterward. In contrast, the traded mollusk value continued to generally increase over time (albeit the observed decrease between 2011 and 2016), indicating value increase as mollusk volume decreased.

The previously mentioned study is relevant to the current study because it discusses the current state of aquatic resource industries such as aquaculture, shellfish fishing, and shell collecting/trading. Since the current study examines using mussels and pen shells in foods like burgers, it falls under aquatic resources as it involves catching these shellfish through fishing. By outlining the trade of products like shellfish, the researchers can gain useful background on

obtaining the key ingredients as for the sourcing of raw materials - mussels and pen shells.

The study of Ansaldo, J. et al., (2022) entitled “Perceived Value and Purchase Intention on Fast-food Plant-Based Meat Alternative Products in Metro Manila”. This study establishes a strong correlation between consumers' purchase intentions for plant-based meat substitutes supplied in particular Metro Manila fast-food restaurants and their perceived values (hedonic and utilitarian values). The plant-based meat substitute concept has recently been embraced by the fast-food business in the region. The researchers employed a quantitative research methodology, specifically the descriptive-correlational design for data collection, with the goal of identifying significant connections between variables through regression analysis. A total of 322 Filipino fast-food consumers who choose plant-based meat substitutes were polled using self-administered questionnaires. Adapted assessment scales with an overall Cronbach's Alpha reliability of 0.887 that comprise five items each for Hedonic Value, Utilitarian Value, and Purchase Intention

The study has a relevance to the present study because it discussed the consumer behavior, particularly in relation to plant-based meat alternatives. This research focuses on important factors such as taste satisfaction, health considerations, and environmental concerns this can help the researchers to enhance the sensory evaluation of the product. The study explores the potential acceptance and marketability of a plant based burger patty. Understanding

consumer preferences and product acceptance can help the researchers provide valuable insights.

The study conducted by Apines-Amar, M. J. S. et al., (2022) one sustainable solution to the issue of poor production resulting from a lack of seed supply is the manufacturing of mussels' seeds in hatcheries. In the Philippines, we carried out the first hatchery production trials of Asian green mussel Perna viridis spats to show that it is feasible to provide an adequate and consistent seed supply for grow-out operations. Nevertheless, small-scale experiment results cannot be immediately applied to the commercial world until they have been validated in larger facilities that closely resemble commercial hatcheries. Therefore, employing industry-scale tank facilities for a production run, methods for collecting broodstock, spawning, and rearing larvae that were established by the project during the experimental trials were put to use and confirmed. In the hatchery, mature broodstocks that were taken from conventional mussel-growing sites were able to effectively spawn. After fertilization, the eggs gave rise to D-hinged larvae, pediveliger, and early spit before finally maturing into the spat stage.

The previously mentioned study is relevant to the current study because it discussed the supply of the manufacturing of mussels this will be under the sourcing of raw materials. The components of mussel aquaculture including as collecting brood stock, spawning, and rearing larvae, by understanding these components can help the researchers know the sourcing of materials. These methods are important for preserving a healthy mussel population, which in turn

affects the amount and quality of mussel flesh that can be used to burger patties. By understanding these study both the management and researchers will benefits for both quantity and quality in the production of mussel seed, which in turn affects the total availability and quality of mussel meat for the creation of burger patties.

According to the study by Toralde, C. B. et al., (2021) Perna Viridis, the green mussel, is farmed and extensively available in the Philippines for commercial use or just for the purpose of subsistence. Because of its ability to withstand a variety of environmental factors, it can flourish quickly in crowded colonies on a variety of hard substrates. P. viridis cultivated with stake and longline approach, and those flourishing in untamed colonies in the Bays of Leyte, Villareal, and Cancabato, respectively, were investigated to offer information about this organism's biological traits and its surroundings. The computation of Green mussels in Cancabato Bay had the highest condition index (CI) values (15.73% ± 5.95), according to the data. That at Leyte Bay (15.34% ± 2.37) came in second. A detailed morphological analysis of the mussels revealed that during the whole sex ratio, women dominated sampling period in all bays (59% females: 41% males).

The study has a relevance to the present study because emphasizes how widely available green mussels are in the Philippines, for both personal use and trade. Comprehending the accessibility and cultivation methods of mussels may enhance the researcher’s investigation about the procurement and handling of mussels for the manufacturing of burger patties in addition to pen shell. The

researchers can improve the decisions on the selection, processing, and preparation of mussels for burger patty.

Synthesis of the Art

Proponents use various local and foreign literature and studies from different sources to support each study. These would show the Variation of Burger Patty Using Molluscs (Pen shell and Mussels).

The literature reviewed highlights the critical aspects of developing and maintaining high-quality, innovative seafood patties by leveraging standard recipes, ingredient assessment, and advanced packaging techniques. Standard Recipes and Consistency Sackes (2023) underscores the importance of standard recipes in ensuring consistency in taste, portion size, and presentation. These practices are essential for developing a new product like seafood patties, as they provide exact, measurable amounts of ingredients and preparation methods.

Quality Assessment and Storage Turner (2024) emphasizes the necessity of assessing ingredient quality, particularly for poultry, but these principles are equally applicable to seafood. Freshness indicators such as color, texture, smell, and date labeling are vital for ensuring the safety and quality of the meat.

Preservation Methods for Shellfish Gökoğlu (2021) discusses various preservation methods for shellfish, highlighting their perishable nature and the need for immediate preservation post-harvest.

Nutritional Benefits and Innovative Packaging by Jayasekara et al. (2020) elaborate on the nutritional benefits of seafood, which is rich in high-quality proteins, essential amino acids, vitamins, and minerals. Abraham (2022) introduces the concept of smart packaging, which includes active and intelligent packaging solutions to extend shelf life and enhance food safety.

Local Marine Resources and Economic Contribution Rayo (2022) highlights the economic and ecological importance of the West Philippine Sea, a significant source of marine resources. The availability of diverse marine resources supports efficient production and contributes to the economy and food security. However, Daguno-Bersamina (2024) warns about the risks of paralytic shellfish poison in certain areas, emphasizing the importance of sourcing safe raw materials to avoid food poisoning.

The study by Othman, S.H. et al. (2022) emphasizes the significance of packaging and extending the shelf-life of products. In contrast, Santos (2020) delves into factors influencing consumer decisions regarding plant-based meat alternative products, such as taste satisfaction, health considerations, and environmental concerns, providing valuable insights for the fast-food industry and seafood producers entering this expanding market. Additionally, studies by Wang Y. et al. (2022) and the Frontier Nutritional (2022) explore various cooking methods' effects on the flavor, taste, and sensory properties of aquatic products.

The study by Rafi Ahmad L (2023) underscores the significance of product quality in burger patty innovation, emphasizing its role in satisfying consumer preferences.

This synthesis encompasses an overview of the related literature and studies, summarizing the collective findings and insights. These are the synthesis of the art which summarizes the overall review of related literature and studies.

Gap Bridged by the Study

After analyzing the related references, the researchers found limited studies on Pen shells and mussels. The researcher gathers the data and information to the related government agencies and identifies that there are no existing products about the pen shell and mollusks. However, it suggests that pen shell and mollusks be preserved. In the review of related literature, it was discussed in the study of Gökoğlu, N. (2021) entitled “Shellfish Processing and Preservation” Shellfish are very perishable foods and must be preserved just after catching or harvesting. For each species processing and preservation methods such as chilling, freezing, canning and curing are examined, plus the important safety aspects specific to each shellfish type. It was a similar product however this study would focus on the development of a different variety of seashell which is made to be a burger patty which will be using the same raw material. Thus, the researchers would like to be producing their own variety of pen shell and mollusks burger patty and this will inform consumers of the existence of the pen shell and mollusks and give it an opportunity to be

introduced to the consumer market. Furthermore, there was no study that is exactly the same with the Variation of Burger Patty Utilizing Pen shell and Mussels.

This is the gap identified and bridged by the present study

Theoretical Framework

This study is founded on the theories on Theory New Product Development by Esen Gurbuz's and Diffusion of Innovations Theory by Everett M. Rogers.

Esen Gurbuz's theory on New Product Development identifies a product which can be a physical object or a service should be functional and emotional to satisfy the customer's need, and to offer value, be delivered as the way customer demanded. Also, it has to include other specific elements like providing customer services. New product is the result of a creative and unique idea that is able to make consumers satisfied. In the new product development process, change extends beyond physical attributes to encompass all aspects of the product. Diverse ideas lead to the creation of varied goods, positively impacting customer perceptions of a business. Introducing a product that meets customer needs can diminish demand for competitors' offerings.

In reviewing the theory of New Product Development, it is related to our current study because of our innovative product which is utilizing pen shells and mussels for alternative ingredients for burger patties exemplifies the principle that

new products mentioned above, satisfying customer needs while offering novelty and uniqueness by introducing a creative and unique idea like using pen shell and mussel. Furthermore, the theory mentioned that it will help the researchers in creating a product that will be useful in the future.

In 1962 Everett M. Rogers developed Diffusion of Innovation Theory is one of the oldest social science theories. It originated in communication to explain how, over time, an idea or product gains momentum and diffuses (or spreads) through a specific population or social system. The end result of this diffusion is that people, as part of a social system, adopt a new idea, behavior or product. Adoption means that a person does something differently than what they had previously (i.e., purchase or use a new product, acquire and perform a new behavior, etc.). The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. It is through this that diffusion is possible.

The Diffusion of Innovation Theory is connected with the present study because it explains how new ideas, products, or practices spread through a population over time. As a result of this spreading process, new ideas, customs, or objects are embraced by the populace. Such adoptions, such as embracing a new product or taking up a new behavior, need a break from prior routines. These people must believe that the behavior, concept, or product is novel or ground-breaking for such a change to occur.

By elaborating on these theoretical frameworks, researchers can develop a comprehensive understanding of the multifaceted challenges and opportunities associated with developing a variation of burger patties utilizing pen shell and mussels and devise strategies to address them effectively throughout the research and development process.

The theoretical framework of the study is presented in Figure 1

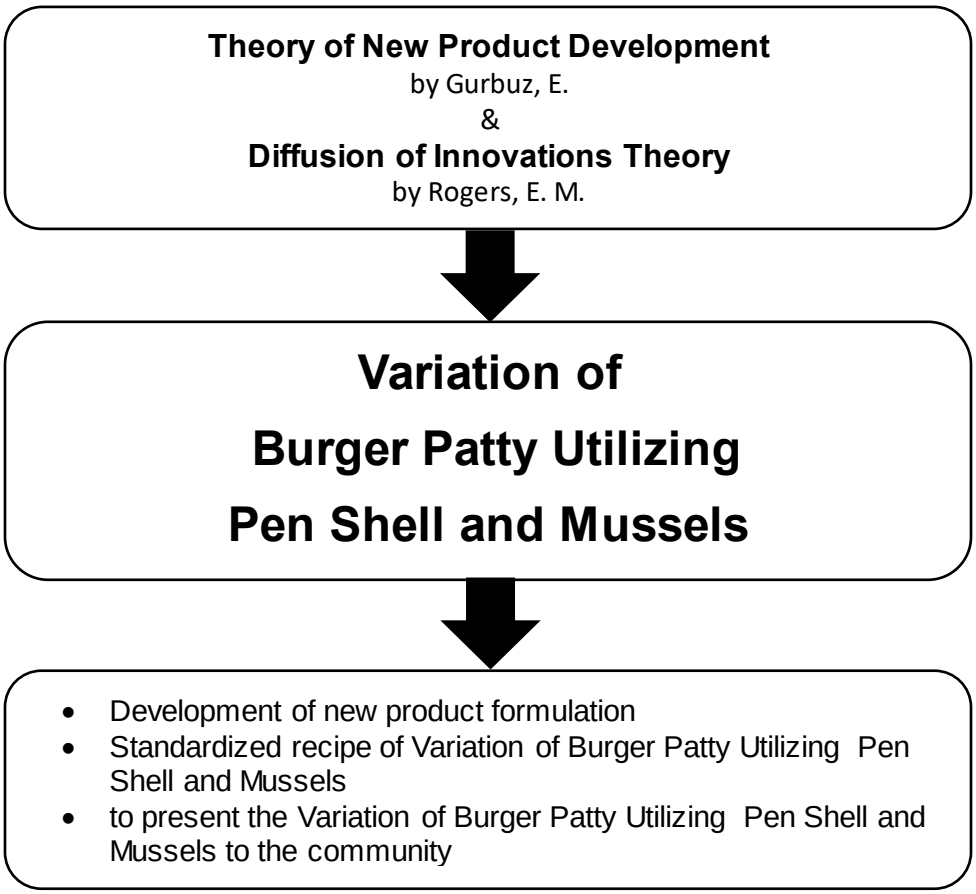

Figure 1

Theoretical Framework of the Study

Conceptual Framework

The study aims to develop an innovative product, a variation of burger patty utilizing pen shell and mussels. It will also identify the process involved in creating and developing the product and the recommendation to improve it further. The conceptual framework has three parts: input, process, and output. The input box states the topic of the researchers. The process box highlights the problem of the researchers that needed to find the answers. It includes the profile of the respondents, the processes involved in creating the product, the acceptability of variations of burger patties utilizing pen shell and mussels and the possible recommendations to further improve our product. The respondent will be composed of specialists in the field such as Food Entrepreneurs, Cooks/Chefs, Food Technologists, Nutritionists/Dieticians, Fisheries Graduate and Consumers. Questionnaires will be used to gather information on the respondent's. This study lays the foundation for further exploration and enhancement of this unique burger patty variation, offering potential avenues for improvement and innovation in the culinary industry.

The conceptual framework of the study is illustrated in figured 2.

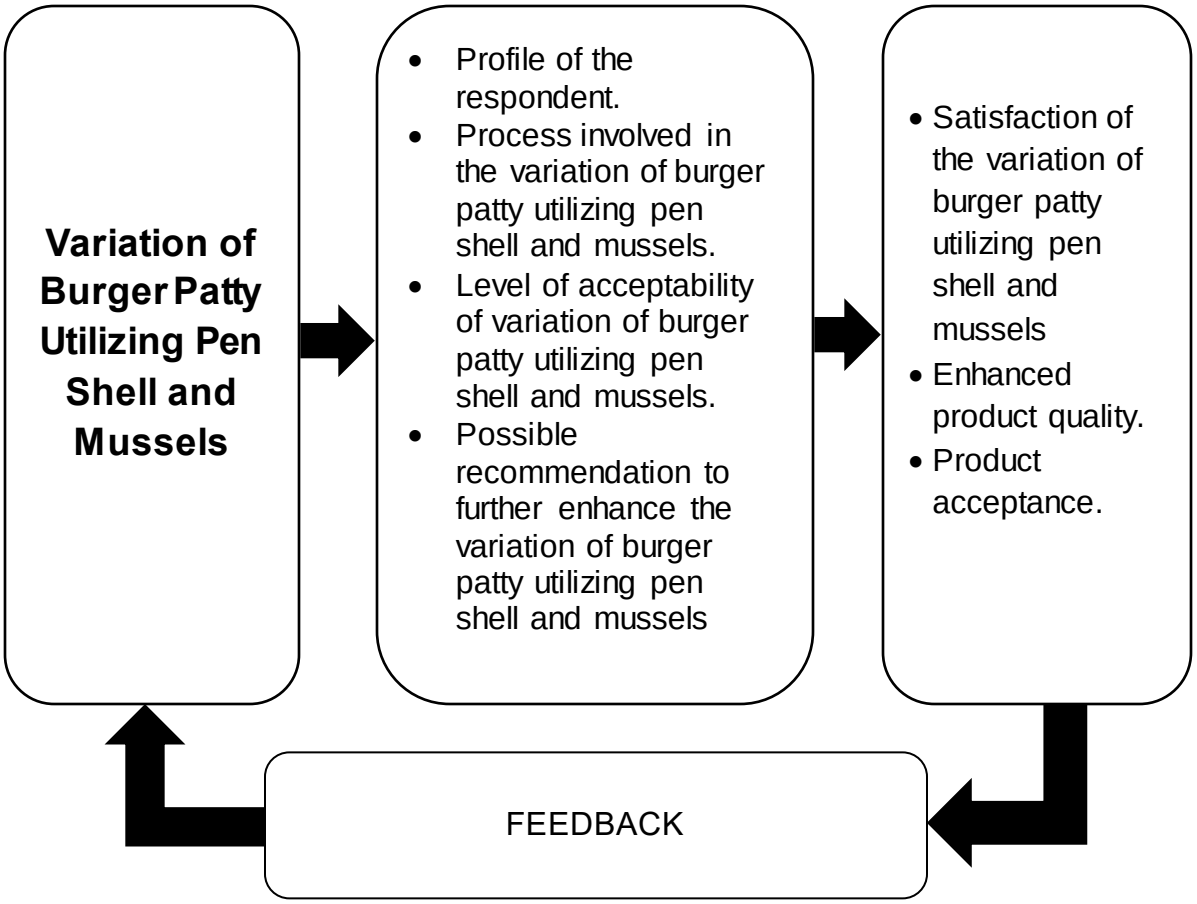

Figure 2

Conceptual Framework of the Study

Definition of Terms

The following terms were conceptually and operationally defined for better understanding.

Appearance. The way that someone or something looks (Oxford Dictionaries) The study defines appearance as the visual characteristics and

properties of a food product. It encompasses the overall look such as color, texture, shape and presentation of the food.

Aroma. Is a distinctive, pervasive, and usually pleasant or savory smell (Merriam-Webster) The study defines aroma that give rise to the odor and aroma of the food it determines the choice and acceptance of the product by the consumer, and also allows the distinction between different types of food.

Method of Processing. the act or process of treating or preparing something by a special method (Collins Dictionaries) In this study method of processing define as the series of actions that are taken to change raw materials during the production of goods

Microbial Analysis. Is the use of biological, biochemical, molecular or chemical methods for the detection, identification or enumeration of microorganisms in a material food, drink, environmental or clinical sample. (Campden BRI) In this study microbial analysis is defined as to determines the total viable microbial count of the food sample. Total bacteria count, total yeast and mold count of the food products.

Moisture Level. Is a tiny drops of water in the air, on a surface, or in the ground (Collins Dictionary) In this study moisture level is defined as a measurement of the total amount of water contained in a food.

Nutritional Content. All the substances that are in it which help you to remain healthy (Collins Dictionary) In this study nutritional content refers to the

nutrients found in the food, such as vitamins, protein, fat, carbohydrates, minerals.

Packaging. Is the container or covering that something is sold in (Collins Dictionary) In this study packaging refers to the process of designing, evaluating, and producing packages attracting the customers can help sell a product.

Ph Level Analysis. It is a measurement of the level of acid or alkali in a solution or substance (Oxford Dictionaries) In this study Ph. level analysis refers as indicates the hydrogen potential or potential of hydrogenions and it is used to determine the degree of alkalinity or acidity of a specific food or any other type of solution, based on the concentration of positive hydrogen ions contained in the compound.

Physicochemical Analysis. Relating to chemistry that deals with the physicochemical properties of substances (Merriam-Webster) This study defines physicochemical analysis refers to the examination of the physical and chemical properties of a food such as nutritional content, ph level, moisture level, and microbial analysis.

Product Costing. The process of calculating the total expenses incurred in manufacturing a product, including direct materials, labor, and overheads (Katanamrp.com) In this study product costing refers to the total expenses in the production of a burger patty utilizing pen shell and mussels.

Recipe Standardization. Is a set of written instructions used to consistently prepare a known quantity and quality of food (Penn State Pressbook) In this study recipe standardization refers to the process of ensuring consistency and uniformity in the preparation of a recipe precise measurements, procedures, and quality standards for each step of the recipe to achieve consistent results every time it is prepared.

Sensory Evaluation. The meaning of SENSORY is of or relating to sensation or to the senses (Merriam-Webster) In this study sensory evaluation defines to measure, analyze, and interpret the characteristics of food such as appearance, aroma, texture, taste, and overall acceptability through the use of human senses.

Sourcing of Raw Materials. The act of getting something, especially products or materials, from a particular place (Cambridge Dictionary) In this study sourcing of raw material refers to the process of identifying, procuring, and managing the materials or components needed for creating the burger patty utilizing pen shell and mussels.

Storage. The act of keeping things somewhere so that they can be used later (Cambridge Dictionary) In this study storage refers to the process of holding, preserving, and managing goods or materials in a designated location until they are needed to use for the burger patty utilizing pen shell and mussels.

Taste. The sensation of flavor perceived in the mouth and throat on contact with a substance (Oxford Dictionary) In this study taste refers to perceive

the flavor of food the taste can be categorized as sweetness, sourness, saltiness, bitterness,

Texture. The feel, appearance, or consistency of a surface or substance (Oxford Dictionary) In this study texture is defined as those properties of a food that are sensed by touch in the mouth and with the hands.