

CHAPTER IV

PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

This chapter contains the presentation and interpretation of data obtained concerning the problems noted in chapter one. This expands on the profile of the respondents, the process involved in making the variation of burger patty utilizing pen shell and mussels, and the possible recommendations to further enhance the product.

1. Profile of the Respondents

The table 1 presents the profile of the respondents with its frequency and percentage rating. The profile includes the age, sex, and profession of the respondents of the study.

Table 1

Profile of the Respondents

Statement	Frequency	Percentage
A. Age		
23–27 years old	15	50%
28–32 years old	5	16.67%
33-40 years old	6	20%
41 years old and above	4	13.33%
Total	30	100%
B. Sex		
Female	15	50%
Male	15	50%
Total	30	100%

C. Profession		
Entrepreneurs	5	16.67%
Cooks/Chefs	5	16.67%
Food Technologist	5	16.67%
Nutritionists/dietitian	5	16.67%
Fisheries	5	16.67%
Consumers	5	16.67%
Total	30	100%

A. Age

The result showed that the respondents' ages vary, the highest frequency count with the percentage of 50% is the age that ranges from 23-27 years old, and the lowest frequency is 41 years and above with the percentage of 13.33%.

The finding of this study presented that most of the respondents range the ages of 23-27 years old as they are the people who responded to our survey. These respondents have varying opinions and preferences of the burger patty.

The possible reasons for the varying result of the study are the following. First, is the difference in liking the product of each person, preference for taste of each person varies among different ages. According to an article, in everyday contact with food, the most pleasant is the stimulus intensity to which the consumer is accustomed. Sensitivity to catch of the flavors varies widely from person to person some studies confirm that people who are sensory insensitive prefer higher concentrations of specific tastes (sour, bitter, sweet, salty, umami). Several factors (social status, age, gender, education, knowledge about healthy eating, and attitude to food) affecting consumer food choices (FC), including the relationship between the taste of food, food choices, and depression, were

analyzed by using sensory traits and face reading technology. This showed that the knowledge on food products and age have significant influence in their food choices.

Hence, the respondents' age differences have a significant impact on the result of this study.

B. Sex

In terms of sex, the results showed that females have 15 respondents and a percentage of 50 %, followed by the male which has a total count of 15 respondents and percentage of 50%. This indicated that, in both male and females, they make up half the total number of respondents.

The results highlight the importance of considering sex as a variable in this research, as it enhances our understanding of behavior, promotes inclusive participation of both sexes, and informs the development of strategies that address the diverse needs of professionals and consumers involved in the production of this product. The survey findings differ between sexes, potentially due to a variety of reasons.

The reasons are first, both of the survey participants in burger patty utilizing the variation of pen shell and mussels was equally divided both male and female. According to ResearchGate (2019), study explores gender-based differences in how service quality influences online consumer behavior. Using data from 330 Chinese consumers, the researchers developed a structural equation model focusing on five dimensions of e-service quality, along with

customer satisfaction and loyalty, to examine gender's moderating role. Findings reveal that while both genders value efficiency equally, significant gender differences exist in responsiveness and reliability, which influence satisfaction. Notably, female satisfaction more strongly affects loyalty than male satisfaction. Practical recommendations suggest prioritizing prompt service for men and reliable service for women when resources are limited. The study also supports self-regulation theory's relevance in online consumer behavior.

C. Profession

The findings on the data gathered shows that there is an equal distribution for each profession. The Food Entrepreneurs, Cooks/Chef, Food Technology, Nutritionist/Dietitian, Consumers and Fisheries all have the same frequency count of six (6) and percentage of 16.67% which sum up to a total of 100% and 30 respondents respectively.

All the profession insights had equal importance in this study as they provide important knowledge, comments and data to answer the survey questionnaires. The professionals would provide a suitable amount of understanding to the new innovative pen shell and mussels patty, businesses invest time in creating and promoting their products, while consumers ultimately decide if these products are acceptable. Combining diverse perspectives, backgrounds, and professional expertise can help gather valuable data to support the study's findings.

The above statement correlates with the needs of professional advice review and skills development in creating innovative products like pen shell and mussels in the hospitality industry. Customer involvement in new product development is currently a thriving activity implemented by companies in order to fulfill customers' needs. By involving customers) in the new product development process, companies aim to get concepts and insights that allow them to improve an existing product or launch a new product in the market. Customer involvement in new product development is considered important for successful product development (Uppsala Universette 2020)

2. The Processes Involved in Development of the Variation of Burger Patty Utilizing Pen Shell and Mussels

Presented in this section are the processes that the burger patty has undergone through its development. The processes involved in making the variation of burger patty utilizing pen shell and mussels are sourcing of raw materials, method of processing, recipe standardization, storage and packaging, product costing, and physicochemical analysis for pH level analysis, moisture level, microbial analysis, nutritional content, and the sensory evaluation which are the appearance, aroma, taste, and texture.

A. Sourcing of Raw Materials

Pen Shell and Mussel are the two primary ingredients used in the process of making the Pen Shell and Mussel Burger Patty. These seafood ingredients are

abundantly harvested in the province of Albay, specifically in Sorsogon Bay is home to the pen shell locally known as Baloko. Sourcing pen shell and mussel directly from local public markets ensures freshness and supports local fishers. For profitability making, purchasing by batches is much preferable.

Table 2 shows all of the information regarding the processes involved in the development of the product.

Table 2
Sources of Raw Ingredients

Ingredients	Sources
Pen Shell	Local Public Markets, Sorsogon and Legazpi
Mussels	Local Public Markets, Sorsogon and Legazpi
Onion	Local Public Markets
Garlic	Local Public Markets
Paprika	Groceries and Supermarkets
Powder Black pepper	Groceries and Supermarkets
Iodized salt	Groceries and Supermarkets
Eggs	Local Public Markets
Sugar	Groceries and Supermarkets
Breadcrumbs	Groceries and Supermarkets
Ginger	Local Public Markets

Oyster sauce	Local Public Markets, Groceries and Supermarkets
Cornstarch	Local Public Markets, Baking Supplies Store
All-purpose flour	Local Public Markets, Baking Supplies Store

The recipe requires pen shell and mussels as the key ingredients to perform the burger patty. These shellfish provide a unique flavor profile and are excellent protein sources. Freshly harvested pen shells and mussels can be sourced from local fishing communities and seafood suppliers along the Albay coast, contributing to the product's local and sustainable footprint. Key suppliers include local seafood markets and fishermen's cooperatives, which provide fresh, quality ingredients for production.

Onions contribute a subtle sweetness and enhance the aroma of the patty. They help balance the flavor profile, making the dish more savory and appealing. Onions can be purchased in bulk from local markets, ensuring affordability and availability for regular production.

Garlic adds a robust and savory flavor to the patty, enhancing its overall taste. It also works well in masking any lingering fishy odor from the shellfish. Garlic is easily sourced from public markets and vendors, making it a staple ingredient for the recipe.

Ginger provides a hint of spice and plays a significant role in neutralizing the fishy smell of the pen shell and mussels. It also enhances the aroma of the patty, giving it a fresh and slightly zesty undertone. Fresh ginger is readily available in local markets and is a key addition to the recipe.

Salt sharpens and elevates the flavors of the patty, ensuring that the other ingredients stand out. It is an indispensable ingredient for balancing the taste and is widely available in groceries and public markets.

Sugar adds a touch of sweetness to the patty, helping to balance out the savory and spicy elements. It plays a crucial role in creating a well-rounded flavor profile. Sugar is a common ingredient that can be easily sourced from grocery stores.

Oyster sauce enhances the patty's umami flavor, adding depth and richness to the taste. It ensures that the shellfish flavors are more pronounced and well-balanced. Oyster sauce is readily available in most supermarkets and groceries.

Paprika adds a mild smokiness and warmth to the patty while also giving it a vibrant color. It enhances the overall flavor profile, making the dish more appealing. Paprika is commonly found in grocery stores and spice sections of supermarkets.

Powdered black pepper provides a sharp, spicy kick and complements the other spices in the patty. It adds a layer of complexity to the flavor. Black pepper is easily available in groceries and public markets.

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Breadcrumbs improve the texture of the patty, providing a light and crispy finish. They also act as a binder, helping the ingredients stick together. Breadcrumbs can be sourced from local bakeries and supermarkets, ensuring accessibility.

Cornstarch enhances the firmness of the patty and improves its overall texture. It also plays a role in binding the ingredients, ensuring a cohesive mixture. Cornstarch is commonly available in supermarkets and general stores.

All-purpose flour acts as a binding and thickening agent in the patty mixture. It helps create a firmer, well-structured patty that is easy to cook. Flour is widely accessible in supermarkets, general stores, and public markets.

A key idea in sourcing and buying raw ingredients is the procurement process. This process includes a variety of steps to obtain goods and services, focusing on a more strategic approach. An essential part of procurement is choosing the right supplier who can provide high-quality ingredients at a fair price. By sourcing from local suppliers, the procurement process not only supports nearby businesses but also ensures the freshest ingredients for the highest quality product.

B. Method of Processing

In formulation the standard recipe for development of the pen shell and mussel burger Patty, a series of trials were conducted. The researchers went through eight experiments of testing to reach the ideal taste and texture for the product. Each step in the process was carefully listed, along with the purpose of each ingredient and method used.

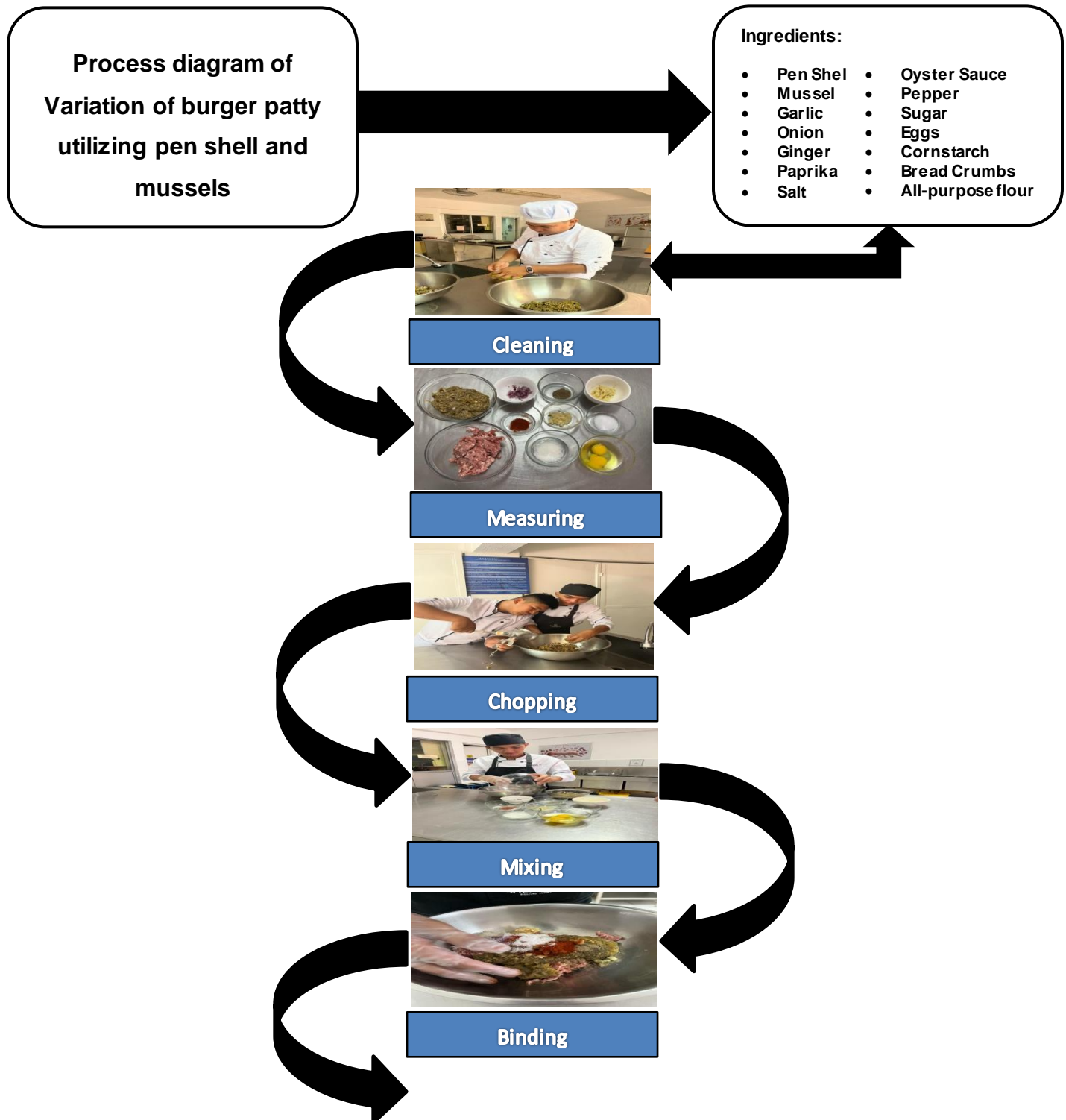
Table 3 present the method used in the development of Burger Patty Utilizing Pen Shell and Mussels.

Table 3
Methods Used in the development of Burger Patty Utilizing Pen Shell and Mussels

Methods	Ingredients Involved	Function
Cleaning	Pen shell, mussels	Removing any impurities, sand, and unwanted materials to ensure food safety and cleanliness.
Measuring	All Ingredients	Ensuring accurate quantities of each ingredient are used to maintain consistency in flavor, texture, and nutritional value.

Chopping	Garlic, ginger, mussels, pen shell	Cutting ingredients into smaller pieces to ensure even distribution and mixing for consistent flavor and texture.
Mixing	Chopped pen shell, chopped mussels, garlic, ginger, pepper, salt, sugar, and seasoning	Combining all ingredients to create a well-blended patty mixture, ensuring all flavors are evenly incorporated.
Binding	Eggs, breadcrumbs, cornstarch, flour	Using binding agents to hold the mixture together, providing structure and preventing it from falling apart during cooking.
Shaping	Mixture,	Forming the mixture into uniform burger patty shapes to ensure even cooking and consistent portion sizes.
Packaging	Finished burger patty,	Wrapping the burger patty to maintain freshness, presentation, and convenience for the customer. Protects the product during handling and ensures safe, clean delivery, and for storing,

In addition, the flowchart for the variation of burger patty utilizing pen shell and mussels is presented in Figure 3.



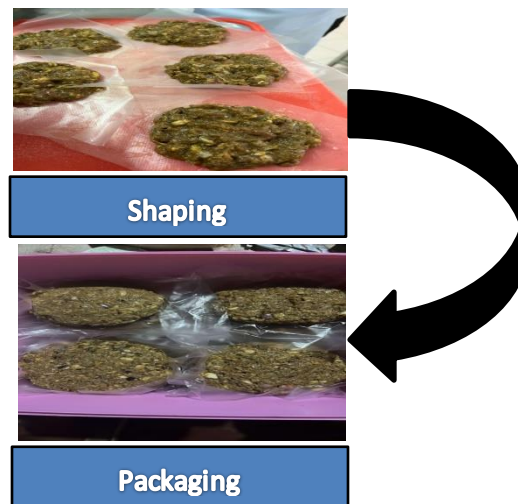


Figure 3

Flowchart of the production of Variation of burger patty utilizing pen shell and mussels

The raw ingredients of the patty have different ways to enhance and ensure the quality of the food product. The methodologies used are cleaning, measuring, chopping, mixing, binding, shaping, and packaging.

Cleaning the raw meat of pen shell and mussel is necessary in preparing the ingredients to ensure the safety of food product and to avoid food and cross contamination. It helps on washing out the smell and slimy texture of raw shellfish meat. Clean ingredients contribute on the taste and safety of food product.

Measuring the ingredients precisely is important in making any food product. It contributes on how the product would taste after all the measuring of ingredients. For accurate measurements, measuring tools are used such as measuring spoon, cups and scales. It helps to make a standardized recipe.

According to Alipio Umiten (2023) Chop is to cut food into small pieces using a knife or other cutting tool. In production of the food product chopping is a method used, there are different ways and technique in chopping. Chopping ingredients helps on improving to enhance the taste and flavor of a food product.

Mixing is a general term used in cooking to describe the process of combining two or more ingredients. The goal of mixing is to evenly disperse one ingredient in another (Rink T. & Thibodeaux W.). And one of the types of mixing is binding.

Binding is a type of mixing method where all the ingredients are bind together. There are also binders which are an ingredient that can help a mixture hold its shape or remain bound together. In production of patty utilizing pen shell and mussel the researchers used binders to bind the patty and hold its shape.

Shaping of food is a critical factor in its costumer acceptability. As the shape of the food product can contribute on the visual appearance. In shaping the food product, the researcher used hamburger shaper to make a circle shape patty.

According to Onyeaka H. (2022) in culinary terms, Food packaging is an essential component of food processing and serves as intermediary material between food producers and consumers. During transit, storage and handling, the packaging material safeguards the food product from hazards that might compromise quality and safety. The integrity of food packaging materials is sacrosanct to food producers, and compromised packaging systems might impair

the quality, safety, and acceptance of the food product. The packaging used for storing the patty is a plastic that holds the patty's shape.

C. Recipe Standardization

This section presents the standardized recipe for the variation of burger patty utilizing pen shell and mussels. All the adjustment on the quantity of ingredients and changes in procedure are recorded and taken into account. The table 4 shows all the trials conducted by the researchers in order to achieve the desired output.

Table 4 shows that it took eight trials before the researchers arrived at the final formulation of the recipe. The first trial has ground beef

Table 4

Trials Conducted in the Development of Burger Patty Utilizing Pen Shell and Mussels

Trial 1	
Ingredients	Quantity
Pen Shell	½ kilo
Mussel	½ kilo
Ground Beef	½ kilo
Paprika	2 teaspoon
Garlic	2 bulb
Onion	1 pieces

Salt	3 teaspoon
Pepper	2 teaspoon
Eggs	4 pieces
Sugar	3 teaspoon
Trial 2	
Ingredients	Quantity
Pen Shell	½ kilo
Mussel	½ kilo
Paprika	2 teaspoon
Garlic	2 bulb
Onion	1 pieces
Salt	3 teaspoon
Pepper	2 teaspoon
Sugar	3 teaspoon
Trial 3	
Ingredients	Quantity
Pen Shell	½ kilo
Mussel	½ kilo
Paprika	2 teaspoon
Garlic	2 bulb
Onion	1 pieces
Salt	3 teaspoon
Pepper	2 teaspoon

Eggs	2 pieces
Sugar	3 teaspoon
Trial 4	
Ingredients	Quantity
Pen Shell	¼ kilo
Mussel	¼ kilo
Paprika	1 teaspoon
Garlic	1 bulb
Ginger	25 grams
Onion	1 pieces
Salt	1 ½ teaspoon
Pepper	1 teaspoon
Eggs	2 pieces
Sugar	1 ½ teaspoon
Trial 5	
Ingredients	Quantity
Pen Shell	½ kilo
Mussel	½ kilo
Paprika	2 teaspoon
Garlic	2 clove
Ginger	50 grams
Onion	1 pieces
Salt	3 teaspoon

Pepper	2 teaspoon
Eggs	2 pieces
Sugar	3 teaspoon
Cornstarch	1 cup
Trial 6	
Ingredients	Quantity
Pen Shell	½ kilo
Mussel	½ kilo
Paprika	2 teaspoon
Garlic	2 bulb
Ginger	50 grams
Onion	1 pieces
Salt	3 teaspoon
Pepper	2 teaspoon
Eggs	2 pieces
Sugar	3 teaspoon
Cornstarch	1 cup
Bread Crumbs	1 cup
Trial 7	
Ingredients	Quantity
Pen Shell	½ kilo
Mussel	½ kilo
Paprika	2 teaspoon

Garlic	1 bulb
Ginger	40 grams
Onion	1 piece
Salt	3 teaspoon
Pepper	2 teaspoon
Oyster Sauce	30 grams
Eggs	2 pieces
Sugar	3 teaspoon
Cornstarch	1 cup
Bread Crumbs	1 cup
All-purpose flour	1 cup
Trial 8	
Ingredients	Ingredients
Pen Shell	1 kilo
Mussel	1 kilo
Garlic	1 bulb
Onion	1 piece
Ginger	50 grams
Paprika	2 teaspoon
Salt	3 ½ teaspoon
Oyster Sauce	60 grams
Pepper	2 teaspoon
Sugar	3 teaspoon

Eggs	2 pieces
Cornstarch	1 cup
Bread Crumbs	1 ½ cups
All-purpose flour	1 ½ cups

In the first trial, ground beef was added to the pen shell and mussels, making the patties taste richer but hiding the seafood flavor. Using 4 eggs made the mixture too soft and hard to hold together. This trial showed that the focus should be on the seafood instead of mixing it with other meats.

The second trial removed ground beef and eggs to focus only on the seafood flavors. While the patties tasted better, they were too dry and crumbly without the eggs to hold them together. This trial made it clear that the patties needed a binding ingredient to improve their texture.

In the third trial, 2 eggs were added back to make the patties less dry and more stable. This improved the texture and kept the focus on the seafood taste. However, the patties still needed more flavor to make them stand out.

The fourth trial reduced the amount of pen shell and mussels to ¼ kilo each and added ginger for a bit of spice. The smaller batch allowed better control of the ingredients, but the patties still needed improvements in taste and texture to make them more appealing.

The fifth trial added cornstarch to help the patties hold together better. Ginger was also increased to lessen the fishy smell of the shellfish. This trial

showed progress, as the patties were less crumbly and had a smoother texture, but more changes were needed to improve flavor and consistency.

In the sixth trial, bread crumbs were added, giving the patties a better texture and a slightly crispy crust when cooked. This worked well with the cornstarch, making the patties more stable. However, the flavor was still a bit plain, so more ingredients were planned for the next trial.

Oyster Sauce was added in the seventh trial to make the patties more flavorful, and all-purpose flour helped improve the mixture's consistency. The balance of spices was adjusted, and this trial produced a well-textured patty, but it still needed a richer taste to make it exceptional.

The final trial doubled the seafood to 1 kilo each, making the patties richer in seafood flavor. Oyster sauce was added to give a savory taste, while the amount of bread crumbs and flour was increased to handle the larger mixture. This trial successfully created a flavorful, well-textured patty that highlighted the seafood.

The standardized recipe for the variation of burger patty utilizing pen shell and mussels is shown in four columns in table 5. The first part of the recipe contains the recipe name, total yield, portion size, classification, preparation time, and cooking time. The second part of the recipe shows the ingredients, quantity required, unit of each ingredient, and the methods performed to produce the product.

Table 5

Standardized Recipe of Burger Patty Utilizing Pen Shell and Mussels

Recipe Name:	Burger Patty Utilizing Pen Shell and Mussels	Classification:	Appetizer
Total Yield/Servings:	30	Preparation Time:	15 – 20 minutes
Portion Size:	75 grams	Cooking Time:	5 - 10 minutes
Ingredients	Quantity	Unit	Method
Pen Shell	1	K	Finely chop the ingredients and in a large bowl mix the ingredients such as pen shell, mussels, garlic, and onion.
Mussel	1	K	
Garlic	50	g	
Onion	30	g	
Ginger	50	g	Grate the ginger and add into the patty mixture.
Paprika	2	tsp	Add the seasoning with paprika, salt, oyster sauce, pepper, and sugar.
Salt	3 ½	tsp	
Oyster Sauce	60	g	
Pepper	2	tsp	
Sugar	3	tsp	
Eggs	2	pcs	Then add the eggs, cornstarch, bread crumbs, and all-purpose flour to bind them together mix it thoroughly.
Cornstarch	1	cup	

Bread Crumbs	1 ½	cups	Lastly shape the mixture into uniform burger patty shapes to ensure even cooking and consistent portion sizes.(75 grams)
All-purpose flour	1 ½	cups	

D. Storage and Packaging

Storing

Table 6 shows the list of ingredients, the preferred storage conditions, and the storage duration of each component of the product. The shelf life of the mentioned raw materials such as the main ingredients, seasoning/flavouring, poultry products, and binding agents were gathered accordingly to literature that studied on how long these materials can preserved and last in the proper storage.

Table 6

Raw Materials and Their Preferred Storage

Ingredients		Preferred Storage	Shelf Life
Main Ingredients	Pen Shell	Freezer	3-4 months
	Mussel	Freezer	3-4 months
Seasoning/Flavoring	Garlic	Dry Storage	3-5 months
	Onion	Dry Storage	2-3 months
	Ginger	Dry Storage	1-2 weeks
	Paprika	Dry Storage	1 year

	Salt	Dry Storage	5 years
	Oyster Sauce	Dry Storage	2-3 years
	Pepper	Dry Storage	1-3 years
	Sugar	Dry Storage	2 years
Poultry Products	Eggs	Dry Storage	3-5 weeks
Binding Agents	Cornstarch	Dry Storage	indefinitely
	Bread Crumbs	Dry Storage	6-8 months
	All-purpose flour	Dry Storage	6-8 months

Storing raw materials correctly is an important aspect of food safety and quality, as it helps extend the shelf life of ingredients used in the production of burger patties. The pen shell and mussels, being perishable seafood, require freezing to preserve their freshness and prevent spoilage. When stored in a freezer, these ingredients can last for 3 to 4 months. Freezing ensures that the texture and flavor of the shellfish are maintained, making them suitable for continuous production and maintaining the desired quality of the patties.

Dry storage is recommended for aromatic ingredients such as garlic, onion, and ginger. These ingredients play a key role in enhancing the flavor of the burger patties while masking the fishy smell of the shellfish. Garlic can be stored for 3 to 5 months, onion for 2 to 3 months, and ginger for 1 to 2 weeks in a dry, cool environment. Proper storage prevents moisture exposure, which can lead to spoilage or mold growth. Ensuring these ingredients are stored properly helps maintain their natural flavors and freshness. Seasonings and flavorings, such as paprika, salt, pepper, and oyster sauce, also benefit from dry storage.

These ingredients have a longer shelf life, ranging from 1 to 5 years, making them highly convenient for long-term use.

Binding agents like breadcrumbs and all-purpose flour are essential for the patty's structure and texture and should also be stored in dry conditions. Breadcrumbs can last for 6 to 8 months, while flour has a similar shelf life when kept in airtight containers. Eggs, being more perishable, should be stored in the refrigerator and used within 3 to 5 weeks to retain their freshness. Proper storage practices not only ensure the quality of the raw materials but also reduce wastage and contribute to the safe production of the burger patties.

The Food and Drug Administration (FDA) underscores the critical importance of proper food storage to prevent foodborne illnesses and maintain food quality. It provides guidelines on buying, storing, preparing, and serving food safely to minimize the risk of contamination. With millions of Americans experiencing foodborne illnesses each year, the Food and Drug Administration stresses the need for vigilance in handling food, particularly perishables like meat, dairy, and seafood, and offers resources such as the Food Keeper app to help consumers understand storage timelines (FDA, 2023). This information is important for the researchers, following safe food storage practices can help ensure that the ingredients stay fresh and safe for customers. Since seafood spoils quickly if not stored correctly, using proper storage, like freezing at the right temperatures, is critical. This not only keeps our patties high-quality but also protects customers from potential health issues.

Packaging

According to Comet, M. (2024) the importance of packaging in ensuring food safety and extending shelf life, with particular focus on the FDA's guidelines for food-safe materials. The article emphasizes the need for food packaging to be not only functional but also visually appealing to attract consumers. Various types of packaging materials such as cardboard, plastic, metal, and glass are explored in terms of their suitability for different food products. The article also discusses emerging trends like sustainable packaging, particularly eco-friendly and biodegradable options, in response to growing environmental concerns.

The packaging of the burger patty utilizing pen shell and mussels is thoughtfully packaged in a durable round plastic container to ensure both quality and convenience. The container is made from food-grade material that maintains the freshness and flavor of the patties while preventing contamination during storage and transport. The round design makes the container easy to stack and store, saving space in both commercial freezers and household refrigerators. Additionally, it includes a clear lid, allowing customers to see the product inside, which adds to its appeal and transparency. The container is also designed to be reusable or recyclable, aligning with eco-friendly practices and reducing waste. Clear and professional labeling on the lid provides essential details about the product, including the ingredients, nutritional information, and storage instructions, ensuring customers have all the information they need. Whether for personal use or commercial purposes, our packaging reflects both practicality

and quality, making our burger patties a convenient and reliable choice for any occasion.

Packaging plays a vital role in maintaining the quality and freshness of burger patties. It serves as a protective barrier, preventing contamination, moisture loss, and spoilage during storage and transportation. Packaging also contributes to the overall presentation and appeal of the burger patties. Attractive and eco-friendly packaging can enhance customer perception and add value to the product. In order to develop a packaging design that is not only aesthetically pleasing but also safe and appropriate for the food product, the researchers have investigated a number of market concepts.

E. Product Costing

The cost of raw materials for each batch of the recipe is shown in this section. These prices are based on the Recommended Retail Price (RRP) of the ingredients when bought from the sources that are specified. The cost of the product can be adjusted as the demand for the product changes and more batches are needed.

Table 7 shows the cost of the ingredients for the burger patty utilizing pen shell and mussels. It has six columns that listed the specification of the ingredients, as well as their quantity, unit of measurements, unit price, per unit purchase, and the unit cost each ingredient. The cost of each ingredient, which is in column six, was computed by dividing the quantity by per unit purchase and multiplying the quotient to unit price.

Table 7

Recipe Costing of Burger Patty Utilizing Pen Shell and Mussels

Name of Recipe:		Burger Patty Utilizing Pen Shell and Mussels		Yield		30
QTY	Unit of Measure	Ingredient Specification	Unit Price	Per Unit Purchase	Unit Cost	
1	kg	Pen Shell	P 300.00	1kg	P 300.00	
1	kg	Mussel	P 400.00	1kg	P 400.00	
50	g	Garlic	P 85.00	1000g	P 4.25	
30	g	Onion	P 90.00	1000g	P 2.70	
50	g	Ginger	P 180.00	1000g	P 9.00	
10	g	Paprika	P 220.00	500g	P 4.40	
17.5	g	Iodized Salt	P 60.00	300g	P 3.50	
60	g	Oyster Sauce	P 20.00	60g	P 20.00	
10	g	Pepper	P 71.75	100g	P 7.18	
15	g	Sugar	P 88.00	500g	P 2.64	
2	pcs	Eggs	P 10.00	2 pc	P 20.00	
250	g	Cornstarch	P 39.80	500g	P 19.90	
375	g	Bread Crumbs	P 153.35	1000g	P 57.51	
375	g	All-purpose flour	P 44.00	400g	P 41.25	
3	packs	Round plastic container	P 55.00	10pcs/pack	P165.00	
Total Cost					P 1057	
Buffer Margin (10% of Total Cost)					P 105.70	
Total Recipe Cost					P 1162.70	
Cost Per Yield (Total Recipe Cost/Yield)					P 38.76	
Selling Price (Cost per yield/ mark-up factor [0.55])					P 70.00	

The total cost of production per batch is Php 1057. The mentioned amount covers all of the ingredients together with the packaging materials used in the production of burger patty. The production made 30 yields of burger patty, which was packed in a round plastic container weighing 375 grams each.

According to Leveraged Equities Limited (2024), the buffer is an allowance over and above the approved loan to value ratio or Lending Ratio to accommodate small market fluctuations without triggering a Margin Call. In most circumstances, Leveraged offers a buffer of 10%. Buffer margin is an important factor in determining the recipe costing of a food product. As the prices of goods continue to rise as time goes by, buffer margin ensures that any changes in the prices of required ingredients will be covered.

The allotted buffer margin for the recipe of burger patty utilizing pen shell and mussels is Php 105.70, which is 10% of the total cost. Therefore, the total recipe cost amounted to Php 1162.70. The cost per serving was calculated by dividing the total recipe cost by the number of yields, which resulted in the amount of Php 38.76. Meanwhile, the selling price was determined by dividing the cost per serving by the markup factor the selling price of the burger patty is Php 70.00

The costing method is essential for evaluating the product's financial viability. By including a buffer margin of 10% (₱105.70), the total cost reaches ₱1162.70, which ensures contingencies like ingredient price fluctuations or wastage are accounted for. The cost per serving is calculated at ₱38.76, and the

selling price is calculated at ₱70.00, which can help in pricing decisions. Relating this to the business perspective, detailed costing ensures informed decision-making and a competitive edge in the market. Knowing precise costs allows the business to adjust pricing strategies based on customer demand and market competition. This financial clarity helps avoid underpricing or overpricing, ensuring the long-term success of the product.

3. The level acceptability of variations of burger patty utilizing pen shell and mussels

This section presents the level of acceptability by the respondents through the results of (a) physicochemical analysis issued by Bicol University – Regional Center for Food Safety and Quality Assurance (BURCFSQA) (Appendix F) and (b) sensory evaluation via data gathered from the respondents through survey questionnaire (Table 8). The product was offered as a free taste sampling to different parts of Legazpi City to the chosen industry experts.

a. Physicochemical Analysis of Variations of Burger Patty Utilizing Pen Shell and Mussels

This parameter describes the physicochemical analysis (pH level analysis, moisture level, microbial analysis, nutritional content) issued BURCFSQA (Appendix F).

pH Level Analysis

According to Rodrigues, R., PhD. (2024, May 3). The term pH can be defined as the “potential of the hydrogen ions” and its value determines many factors in the chemical environment of molecules, affecting properties such as the solubility of compounds, chemical reactions, and availability of nutrients, biological functions and microbial activity among many others. pH testing is the process by which the acidity or alkalinity of a substance is determined. Expressing the acidity of a solution imposes challenges as it involves single ion species quantification, over a broad range of concentrations. Therefore, a more convenient way to express this property was established based on a logarithmic measure of the concentration of hydrogen ions in a solution.

Analyzing the pH level of the product is important to ensure the safety and quality of food goods. The pH is a measurable parameter between the values of 0 and 14, defining the acidity or alkalinity of a solution. Solutions with a pH = 7 are considered neutral, pH below 7 are considered acidic and pH above 7 are considered basic, or alkaline. Based on the BURCFSQA result, the pen shell and mussel burger patty has a pH level of 6.36 which means the food product is acidic, which is common for most burger patty products.

Moisture Level

According to Moore, S. (2020) Moisture content in food can have a significant impact on factors such as the product's taste, texture, appearance, shape, and weight. It has implications on legal and labeling requirements, economically important requirements, the shelf life of the food or food products,

food quality measurements, and food processing operations. Moisture content refers to the number of water molecules that become incorporated into a food product. Moisture can enter into a product in a number of ways, it could be related to the production method of the product, the atmospheric moisture in the food production area, the packaging method of the product, or it can be related to the method of food storage.

Based on the BURCFSQA result, the pen shell and mussel burger patty has a moisture level of 17.01% due to the combination of its ingredients and the cooking process. Ingredients like mussels and pen shell naturally contain water, which contributes to the patty's overall moisture. Additionally, other components such as eggs and seasoning mixtures can retain some moisture, balancing the patty's texture. During the cooking process, some water content is reduced through heat, but a specific level of moisture is retained to ensure the patty remains tender and juicy. Achieving 17.01% moisture ensures the patty is not overly dry or soggy, providing a good texture and flavor balance.

Microbial Analysis

Microbiological analysis of food products is the use of biological, biochemical, molecular or chemical methods for the detection, identification or enumeration of microorganisms in a material (e.g. food, drink, environmental or clinical sample). It is often applied to disease causing and spoilage microorganisms.

According to Kumar, V. (2023) Predictive modeling of microbial behavior in food is a critical tool for assessing and mitigating potential risks in the food industry. Such models are developed based on mathematical algorithms and empirical data, providing valuable insights into the behavior of microorganisms in various food products and processing conditions. These models must be rigorously validated to ensure their accuracy and applicability to specific cases. The integration of predictive modeling into food safety and hazard analysis offers several advantages, including the ability to forecast microbial growth, identify critical control points, and optimize preventive measures. By leveraging these models, the food industry can proactively manage and reduce the risk of foodborne illnesses, ensuring the safety of consumers.

Total yeast and mold count (TYMC) is used as an indicator of the overall cleanliness of the product's life cycle, from growing, processing, handling, and to storage. Product with high Total yeast and mold count can be detrimental to both consumers and cultivators. The result of the BURCFSQA, the Aerobic plate count, yeast and mold count of the pen shell and mussel burger patty is 1.67×10^4 (cfu/g) and the aerobic plate count has not detected. The yeast and mold count of 1.67×10^4 (cfu/g) indicates moderate microbial growth, likely due to improper storage, contamination during preparation, or poor ingredient handling. To prevent this, ensure proper refrigeration below 4°C , maintain hygiene during processing, use fresh ingredients, and follow storage guidelines to limit spoilage. Regular microbial testing can also help monitor and address contamination risks.

b. Sensory Evaluation of Variation of Burger Patty Utilizing Pen Shell and Mussels

Table 8 illustrates the level of acceptability of variation of burger patty utilizing pen shell and mussels in terms of appearance, aroma, taste, and texture.

Table 8

Level of Acceptability Of Burger Patty Utilizing Pen Shell and Mussels

Statement	Weighted Mean	Interpretation
A. Appearance		
1. The size of the patty is just enough.	3.57	Highly Acceptable
2. The patty has a golden brown crust that contributes to the visual appeal.	3.30	Highly Acceptable
3. It visually stimulates the appetite.	3.47	Highly Acceptable
General Weighted Mean	3.45	Highly Acceptable
B. Aroma		
1. The savory and briny aroma of the patty is indulging.	3.27	Highly Acceptable
2. The smell of shellfish in the patty is noticeable	3.23	Acceptable
3. The patty stimulates the sense of smell.	3.23	Acceptable
General Weighted Mean	3.24	Acceptable
C. Taste		

1. The aroma of butterfly pea vodka is apparent on the product.	3.43	Highly Acceptable
2. The aroma does not have any insignificant scent.	3.10	Acceptable
3. The aroma is sweet-smelling.	3.33	Highly Acceptable
General Weighted Mean	3.29	Highly Acceptable
D. Texture		
1. The patty feels tender and easy to chew.	3.53	Highly Acceptable
2. It has a well-balanced juiciness.	3.37	Highly Acceptable
3. The texture of the patty is not too soft.	3.17	Acceptable
General Weighted Mean	3.36	Highly Acceptable
Overall Weighted Mean	3.34	Highly Acceptable

Appearance

Based on the table presented above, in terms of appearance of burger patty using pen shell and mussels all criteria achieved a qualifier rating a highly acceptable result with a general weighted mean of 3.45. The appearance of the size of the patty is just enough with a highly acceptable mean of 3.57, to be followed by visually stimulates the appetite with a highly acceptable mean of 3.47, and last the patty has a golden brown crust that contributes to the visual appeal with a highly acceptable mean of 3.30.

According to the data acquired from respondents, the overall quality of burger patty in the term of appearance is highly acceptable. This finding aligns with the idea of size of the burger is important to influence the consumer to buy the product.

Nielsen (2024), Patty size and professional seasoning techniques also play a crucial role in enhancing flavor.

Aroma

The savory and briny aroma of patty is indulging with a weighted mean of 3.27 and the smell of the shellfish in the patty is noticeable has a mean of 3.23 to be followed by the patty stimulates the sense of smell which has a mean of 3.23. Hence, the aroma of the burger patty is acceptable for getting 3.24 as the general weighted mean.

The study implied that the acceptability of the burger patty was affected by the aroma perceived by respondents; it suggests that the scent of burger patty is noticeable in overall satisfaction. These findings align that aroma contributes to the flavor of the product. A pleasant smell can improve the quality of the food, while the unpleasant smell can lead to a negative impact on the customers.

According to Smita Mishra (2022), The magic of aroma in food hence is not just confined to the senses but has a lasting impact on health too and this explains this beautiful blend of smell. Each aromatic ingredient used in our cuisine has a significant role to play in increasing the overall value of food. Besides attracting us towards food, they also have a calming impact on the nerves and they help in

relaxing the body and mind by promoting the enjoyment of food. No wonder food scientists employ botanical extracts and essential oils to enhance the aroma of food.

Taste

In term of the taste of the burger patty it has a highly acceptable adjectival rating that has a general weighted mean of 3.29 which interpreted as highly acceptable presented in terms of burger patty it has the flavor of the patty appetizing and has a mean of 3.43, followed by the patty has a good balance of flavor with the mean of 3.33, and lastly the patty is well-cooked with a mean of 3.10.

According to the data collected from the respondent, the overall quality of the burger patty in terms of taste is highly acceptable. The respondents emphasized that the taste of the burger patty is supreme, particularly when compared to the established brand offering competitive flavor. They also highlighted that the importance of precise measurement, even distribution of components, underline the need for a harmoniously balanced flavor profile to enhance the product's appeal.

Engaging our mouths and taste buds is one of the first stages in the process of eating food, before we actually ingest it. (Lewis 2022), Taste, among a surprising amount of other senses, also actually prepares the body to metabolize food. Understanding taste and what your customers enjoy, and will come back for more of, is key to creating a successful food product. Understanding taste and

what your customers enjoy, and will come back for more of, is key to creating a successful food product.

Texture

The physical texture of the burger patty was it was tender and easy to chew in the term of patty allowing it to have a highly acceptable mean of 3.53, followed by the well balanced juiciness with a mean of 3.37 and lastly the texture of the patty is not too soft with a mean of 3.17.

The analyzed result indicated that the burger patty has impacted the respondent on liking the food products. The textures not only contribute significantly to the taste, but they also influence the overall experience and make every bite that much more satisfying.

Texture is important because it gives us more information about a food's structure and how to eat it. While we mostly use our senses of taste and smell to experience flavors, texture plays a significant role too. Texture can attract or detract from a food's other flavors, often causing us to perceive it as saltier as or sweeter than it is. Chefs often use ingredients with different textures to create interesting dishes and unexpected culinary experiences (Market Report 2024).

4. Recommendations to further enhance the Variation of Burger Patties

Utilizing Pen Shell and Mussels

This section shows the findings pertaining to the recommendation to further enhance the variation of burger patties utilizing pen shell and mussels in

terms of appearance, aroma, and taste, texture. The weighted mean and its associated adjectival rating were used to analyze and summarize the presented data.

Table 9
Recommendation To Further Enhance Burger Patty Utilizing Pen Shell and Mussels

Statement	Weighted Mean	Interpretation
A. Appearance		
1. Standardize the patty's shape and size.	2.03	Moderately Recommended
2. Adjust cooking time and temperature to enhance color.	2.53	Recommended
3. Alter the overall appearance to enhance the presentation.	2.10	Moderately Recommended
General Weighted Mean	2.22	Moderately Recommended
B. Aroma		
1. Alter the overall appearance to enhance the presentation.	1.73	Not recommended
2. Alter the overall appearance to enhance the presentation.	1.97	Moderately Recommended
3. Enhance the overall smell to make the patty more appetizing when served.	2.37	Recommended

General Weighted Mean	2.02	Moderately Recommended
C. Taste		
1. Refine the flavor by adjusting the ingredients or cooking method.	1.93	Moderately Recommended
2. Adjust the cooking time and cooking temperature.	2.07	Moderately Recommended
3. Put more seasoning to enhance the flavor of the patty.	1.70	Not recommended
General Weighted Mean	1.90	Moderately Recommended
D. Texture		
1. Modify the patty to make it easier to chew.	1.80	Moderately Recommended
2. Refine the patty to achieve a perfectly balanced juiciness.	1.97	Moderately Recommended
3. Adjust the cooking method to ensure the patty is firm yet tender.	1.90	Moderately Recommended
General Weighted Mean	1.89	Moderately Recommended
Overall Weighted Mean	2.01	Moderately Recommended

Appearance

The outcome of this variable, as evaluated by the experts, is based on the factor such as emphasizing the cooking time to enhance the color of burger patty

and the method got a weighted mean of 2.53, 2.03 and 2.10 have respectively have rating of moderately recommended. The appearance has a general weighted mean of 2.22 and interpreted as moderately recommended.

The data indicates that lessen time and temperature to achieve the golden crust of the patty as recommended by respondents. Most consumers desire a range of product choices when purchasing, in terms of appearance.

Product design and presentation affects people's evaluation of product quality and has a significant impact on their ultimate choice of what they buy. The appearance of products influenced consumers' (Muddana 2019), the appearance of a product can affect how likable the product is to customers.

Aroma

The generated response about this variable in terms of improving the aroma and adding some spices to enhance the overall smell of shellfish for more appetizing smell, a weighted mean of 2.37, 1.97 and 1.73 respectively, with an adjectival rating of moderately recommended, recommended and not recommended. The aroma has a general weighted mean of 2.02 and is interpreted as moderately recommended.

The results show that most of the industry experts recommended adding more spices to lessen the smelly aroma of the shellfish and further additional scent to improve the aroma of burger patty, to easily identify the product. The respondent recommended serving it while hot to enhance the overall smell of the burger patty.

According to the Food security and sustainability (2019), Aroma is one of the important factors in food quality. It is the first signal that consumers experience when present with a food and during eating; the release of aromas and the interactions between taste and aroma have been shown to be crucial in developing foods with premium quality flavors.

Taste

The generated response about this variable in terms of improvement of flavor is by adjusting the correct measurement of ingredient and cooking method with the weighted mean of 2.07, 1.93, and 1.70 with an adjectival rating of moderately recommended and not recommended. The taste has a general weighted mean of 1.90 and is interpreted as moderately recommended.

The results show that most of the respondents recommended adding some additional element such as salt and pepper to enhance the flavor of the burger patty. Though interviews it has been found that respondents have the same reactions to the pen shell and mussels patty similar taste with Angels burger which is a popular budget friendly burger chain known for its affordable burger.

Flavor enhancers are food additives that are added to food to enhance its taste and aroma. They can be natural or synthetic, and they come in various forms, such as spices, herbs, sauces, and seasoning. One of the primary uses of the flavor enhancer is to improve the taste of food that has lost its flavor due to cooking. (African Journal of food Science and Technology, 2023), additionally

flavor enhancers are also used to enhance the taste of bland food, making it more palatable and enjoyable to eat.

Texture

The weighted mean rating for the pen shells and mussels burger patty texture, considering the alternative techniques to improve the consistency, the application of appropriate ingredient measurements, and mixing method, are 1.97, 1.90 and 1.80 respectively. These results are accompanied by a qualifier rating of moderately recommended. In terms of the general weighted mean is 1.89, also interpreted as recommended.

The result shows that most of the industry experts recommended observing the proper over mincing the pen shells and mussels to make it firm and chewable easily. Cooking medium fire can lead to more proper texture of the pen shells and mussels.

Food purchasers and food manufacturers understand that taste isn't the only factor at play. If a food product lacks the right feel or appeal, the initial bite may also be the final one. (Jang, 2024) The sensation of texture plays a crucial role in the sensory journey of a food product for customers. It can signify freshness or ripeness in certain foods, while also significantly impacting the overall enjoyment of a dish. The term "crispy" evokes memories of indulging in delightful foods like potato chips, creating a connection between the description and a pleasurable eating experience. Similarly, terms such as "creamy" and "chewy" are widely used in food storytelling to evoke specific textural experiences.