

Development and Economic Viability of Milkfish (Chanos-Chanos) Longganisa

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ABSTRACT

Bangus or Milkfish (Chanos chanos) is abundant in the Municipality of Ajuy in such a way that the researcher enables to develop wide array of Bangus by products that have potential market value. This study experimental research focuses on the development of longganisa made of bangus. The study involves two phases; the first phase is the standardization of bangus longganisa which produces three formulations such as, Treatment A- ½ cup milkfish, Treatment B-2 cups milkfish, and Treatment C-3 cups milkfish; the second phases is the determination of acceptability level in terms of aroma, color, taste, texture, and the general acceptability. The products was evaluated by selected panels consist of 10 students, 10 members of faculty, and 10 parents of NIPSC –Ajuy Campus. Using the Likert scale, results revealed that Treatment C was the most acceptable products in terms of color (very acceptable), aroma (very acceptable), texture (very acceptable), taste (highly acceptable), and general appearance(highly acceptable). It was also revealed that there are no significant differences in the level of acceptability of Bangus longganisa when rated by respondents.

Keywords

Milk Fish, Economic Viability, Experimental Research, Applied Research.The Problem and its Background

Article Received: 10 August 2020, Revised: 25 October 2020, Accepted: 18 November 2020

Introduction

Rice and fish comprise the staple food of the Filipinos and since Bangus or Milkfish is the National fish of the Philippines, it plays an important role in the Filipino diet, health and economy.

“Good nutrition, in itself is a requisite towards leading a healthy lifestyle. Combine with physical activity, one can reach a healthy weight, reduce the risk of chronic diseases (heart disease and cancer) and promote an overall health condition (www.hhs.gov).”

Fish provides more than 1 billion people with most of their daily animal protein requirements. It contains the nutrient and micronutrients essential for cognitive and physical development especially in children, hence pork an important role/ portion of a healthy meal. “As an affordable source of protein it became a primary source of nutrition, creating a growing demand for this staple food (www.worldfishcenter.org).”

“With this growing demand, it has now found its space and became commercially valuable to the local fishing industry. Milkfish produced from aquaculture is one of the most traded fish in the local markets and also provides export earnings for the country (Selays, 2010)”.

However, having been used to common food, people skill desire for something much more developed and different. They aspire for food that could provide extra satisfaction as to their sight and taste and other senses. Being very observant to these reactions, technologies and specialists conducted other researchers on this matter. Some test and experiments popped in the production of by products, development and preservation resulting into the emergence of stuffed fish, tocinos and longganisa mixed with meat and meat products. The consciousness of their health, preferences and choices, likes and dislikes, must especially the non-pork/chicken eating groups, prompted the

researchers to develop a meat-like and nutrition longganisa derived from Milkfish.

The researchers of this study made a common decision to utilize Milkfish as main ingredient to substitute pork or chicken in the preparation of longganisa under the title: Development and Economic Viability of Milkfish (Chanos-Chanos) Longganisa, with the hope of giving satisfaction to local consumers and generate income to producers, treated as to color, aroma, texture, taste, and general appearance.

Background of the Study

Milkfish (Chanos-Chanos), the major cultured pinfish in the Philippines is mainly produced for domestic consumption primarily due to its substantial contribution to the animal protein needs of the population. Milkfish is reared in brackish ponds during both wet (June-September) and dry (December-April) seasons. Its semi-intensive production is based on the availability of natural food during the first two (2) months of culture and a supplement feed application when natural food supply begins to diminish (Klaus Backer, 2008).

In most areas in Iloilo especially in the Northern portion, people depend upon fishing as a main source of livelihood. They may either be owners/producers of Milkfish ponds, workers for the producers or marketers on commission basis or retail seller in markets or house to house retailing.

These products, bangus or milkfish serve as the stable food for the population but other have converted them into salted and dried fish, or boneless and stuffed. Due to improvised technology fishponds produced more than the needs of the towns and nearby areas, to the city and even brought to manila.

Later it was discovered that “Milkfish consumption on regular basis can prevent micronutrients deficiencies, can

help in the healthful growth of the hypertension (Demarks, 2009).”

Conceptual Framework

This study is based on the conceptual that bangus (Chanos-Chanos) or Milkfish, due to its benefits to satisfy the consuming population covered be develop into much more satisfying food and be of economic viability for the Filipino. Many had produced stuffed, allenos and tocino. Researcher, thus, considered testing Milkfish to come out with Longganisa as its resultant by-product.

Longganisa is a popular meal for breakfast, but usually made out of pork or chicken. With the increasing health consciousness of Filipino who limit themselves veer away from fatty foods and with more than 60% of the Philippines population receding in or near coastal areas, it is probable to innovate and develop marine food products.

Because all major cities and most large industries are located close to the sea, continuous innovation and development of Bangus product at different variants should be done. Hence, this study involved the exploratory activity. To better understand how the developments were done and to show its economic viability, a conceptual framework illustrates the activities/treatments.

To better understand the relationship of the variables used in the study an illustration of the conceptual framework in figure 1 was shown.

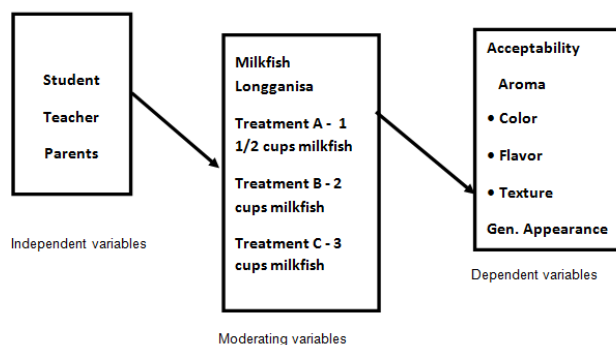


Figure1. Research Paradigm: Development of Milkfish Longganisa as rated by students, teachers, parents and Future Researcher of NIPSC Ajuy Campus.

Statement of the Problem

This study was conducted to assess the development and economic viability of Milkfish (Chanos-Chanos) Longganisa as affected by Color, Aroma, Flavor, Texture, Taste, and General Appearance.

Specifically, these following questions were sought to be answered.

1. What is the acceptability of Milkfish (Chanos-Chanos) Longganisa in terms of color, aroma, texture, taste and general appearance?
2. Is there a significant difference in the ratings of acceptability of Milkfish (Chanos-Chanos) Longganisa in terms of color, aroma, texture, taste and general appearance?
3. Does the acceptability of the development of Milkfish (Chanos-Chanos) Longganisa provide sufficient ground for its economic viability?

Scope and Limitation of the Study

This study covered the acceptability of Milkfish (Chanos-Chanos) Longganisa in terms of color, aroma, texture, taste and general appearance, conducted at Northern Iloilo Polytechnic State College, Ajuy Campus, Ajuy Iloilo in the first semester of the school year 2018-2019.

This study was limited only to the determination of the acceptability of Milkfish (Chanos-Chanos) Longganisa in terms of color, aroma, texture, taste and general appearance, to test its Development and Economic Viability.

Hypothesis

In view of the preceding problems, the null hypothesis was advanced;

There are no significant differences in the ratings of acceptability of acceptability of Milkfish (Chanos-Chanos) Longganisa in terms of color, aroma, texture, taste and general appearance.

Significance of the Study

The results of this study will be of great significance to the following;

To the students, young children and non-meat eaters

Milkfish (Chanos-Chanos) Longganisa would be preferred by students, young children and non-meat eating groups since it contains the natural nutrients and micronutrients which are health substitutes for pork and chicken.

To the Teachers of HRM and Home Economic Teachers

The results of this study will benefits teachers because it will provide them ideas to utilize eats edible like Milkfish which are readily available in the market.

The study will likewise encourage them to venture in businesses that could help students gain entrepreneurial foresight.

To Bangus Producers

They would find means and strive to produce more milkfish in order to cope up with the demands of developers of Bangus Longganisa not only for local consumers but for the retailer and whole

To the Milkfish Fishpond Helpers and Retailers

They would be tempted to produce the own Milkfish (Chanos-Chanos) Longganisa for their family's consumption and to sell to generate additional income

To Parents of HRM Students

This study would encourage parents of HRM students of Northern Iloilo Polytechnic State College to prepare nutritious yet low cost meals for their families like Milkfish (Chanos-Chanos) longganisa. Furthermore, others could

gain some know-how on the nutritive value of eating bangus instead of pork and chicken.

Review of Related Literature and Studies

For centuries, so many writings were published to give the population some guide to proper food and sanitation. Studies were conducted as well to prove their nutritive values and economic viability. One of these topics relate to Bangus Milkfish (Chanos-Chanos).

Related Literature

According to K. Sullivan, et.al (2007). The milkfish industry in the Philippines is as old as its history of aquaculture. Grow-out technology for milkfish is almost perfect through the joint efforts of the academe, fish farmer and scientist, both in the government, private and nongovernment organization. Considering the enonous economics benefits obtained from marine culture technology of milkfish which can be cultured in brackish water ponds near coastal areas, large potential for income enhancement and employment can be generated for coastal communities.

Wilfredo G. Yup (2007) said that the milkfish is the most important fish species being farmed in the Philippines. It is cultivated in freshwater, brackish water and marine environments. A number of milkfish production technologies have been developed to fit these diverse culture situations. These production technologies are modified depending on the location, climate, topography, tidal fluctuation, water current, water depth, available land/space, available supplies and materials, available capital and level of viability.

The milkfish farming according to Radcliffe (1912), Day (1915), Herre and Mendoza (1929) was more of a trap-and-grow operation based on the natural stock of milkfish fry that comes inland with the tidal waters. In 1900s, milkfish farming was purely a private sector effort in many areas of the country, namely: Central Luzon, Pangasinan and Iloilo Provinces.

Fish protein hydrolysates as explained by Chalamaiah et.al., (2012) are smaller peptide fragments of usually 2-20 amino acid in length produced from the enzymatic breakdown of fish proteins. FPHs have been utilized as nutritional supplement, functional ingredients in different foods, and aquaculture feeds for enhancing the growth and survival of fish. FPHs can also be extracted from fish by-products, hence, another alternative for the utilization of increasing fish processing wastes. Protein hydrolysates from fish are currently considered as the most important source of protein and bio-active peptides which is why fish FPHs have gained great attention to food scientists and have been utilized in various industrial applications.

Milkfish is also known as bandeng or bangus, is a silver-colored Pacific salt-water fish that lays its eggs in shallow coastal waters and can withstand low-salinity water. It is a source of animal protein, B-complex vitamins and selenium, but it is also a significant source of fat, saturated fat, cholesterol and calories. A 3-oz. serving of milkfish cooked with dry heat contains 162 calories, 22.4 g of protein, 7.3 g of fat, 2.9 g of saturated fat, 78 mg of sodium and 57 mg of cholesterol, according to the U.S. Department of Agriculture

calculations. Protein accounts for roughly 55 percent of the calories and fat for 45 percent. (Christin's Gray, 2017)

The same serving of milkfish supplies 116 percent of the vitamin B 12, 44 percent of the niacin, 24 percent of the vitamin B6 and 15 percent of the pantothenic acid that the Food and Nutrition Board of the Institute of Medicine recommends adults consume daily. All four of these vitamins are water-soluble B-complex vitamins, and they play vital roles in metabolism; central nervous system function; skin health; and DNA, hormone and red blood cell formation. Milkfish also contains trace amounts of riboflavin, foliated and vitamin A. Milkfish does not contain significant amounts of vitamins C, D, E or K. (Christin's Gray, 2017)

A 3-oz. serving of milkfish offers 25 percent of the phosphorus and the selenium adults should consume daily. Phosphorus is integral to red blood cell oxygenation, and selenium is essential to thyroid and immune function. Milkfish also contains trace amounts of calcium, iron, potassium and zinc. A serving of milkfish contains 20 percent of the saturated fat, 19 percent of the cholesterol and 9 percent of the total fat that MayoClinic.com advises adults to limit themselves to each day. Although milkfish does contain a significant amount of fat, 60 percent of the fat is heart-healthy monounsaturated fat, including omega-3 fatty acids, which are associated with decreased blood triglyceride levels, reduced blood pressure, enhanced immune function and an improvement in arthritis symptoms. (Christin's Gray, 2017)

Recently, food safety and quality have become critical issues of great concern throughout the world. Fish is one of the most vulnerable and perishable aquatic products. The evaluation of fish and fillet freshness is therefore very significant in research and development for providing premium and supreme quality for human health and acceptance by consumers, as well as for international trade. The texture and structure of fish muscle are important freshness quality attributes that depend on several parameters such as hardness, cohesiveness, springiness, chewiness, resilience, and adhesiveness, as well as the internal cross-linking of connective tissue and the detachment of fibers.

Summary

This review aims to present recent advances of texture and structure measurements and analyses, including sensory evaluation and instrumental methods, for indicating and evaluating fish freshness quality. Factors affecting these measurements are detailed and correlations between texture and structure are discussed. Moreover, the limitations and challenges of fish texture and structure measurements are described and some viewpoints about current work and future trends are also presented. The related literature and studies were a representation of previous researches, observations, and studies relating to the milkfish fish. As observed the related literature had thoroughly expanded on the use of milkfish fish as enriching as well as its benefits rather than the presentation of related studies about the final product which is the "milkfish longganisa".

Related Studies

As written by Food Consumption Pattern Panggat, (1998). The global demand for frozen and canned tuna and milkfish products is increasingly growing. This trend implies a more significant increase in the bulk of by-products that may be generated in the years to come. These by-products contain nutritionally important bioactive components in quantities that are comparable or even better than those found in the prime meats Transforming them into an innovative and market-competitive product will not only reduce disposal and environmental problems but will provide increased revenues.

Forty percent of the meat, (Sazon, pers.com 2010) recovered from the backbones and further remove of pin bones during milkfish deboning are good materials for the development of embutido, sisig, and spring rolls. Sazon continued that these materials generally offer the sensorial attributes, specifically desired for highly innovative value-added seafood products. Transforming them into novel seafood products will not only reduce disposal and environmental problems but will also provide increased revenues and food security. Despite dwindling supply of raw materials for processing, especially on sashimi tuna, the conservation and management of the available fish stocks remain a top priority for the stakeholders. In anticipation of an increasing gap between supply and demand in fisheries, there is a strong imperative to optimize the use of available resources in the country.

On the other hand, according to Nelson and Mary Grace (2010) they revealed that Milkfish is widely cultured for good and to supply the longtime fishery bait market, with the main producer countries located in Asia. Philippines, Indonesia, Taiwan for hundreds of years. Production has been steady increasing since the 1950 and milkfish contributes to be an important aquaculture species, with large investment made since the 1979s by some private investors, and donors and governments.

Panggat, et.al, again shared that Milkfish aquaculture, however, ascertains the availability of raw materials for the production of chilled/frozen milkfish products e.g. boneless milkfish fillets, thus generating increased volumes of by-products. Strong collaboration though, between the government and the private sector is highly recommended to support the industry's needs for better sustainability and productivity. The expansion and diversification of product forms become an important concern in order to meet the export demand, particularly, on the quality and safety issues, including packaging and eco-labeling. Value-added products that are popularly sold at the retail stalls i.e. along the busy street corners, schools, malls and supermarkets include the fish balls, quikiam, spring rolls, sausages, burgers, nuggets amongst others. This paper presents status and trends; product innovations; opportunities and challenges for improved utilization of byproducts generated from the processing of tuna and milkfish.

A student in Dagupan City has attracted many bangus consumers when she made a unique treat-flavored ice cream. Mary Grace Cruz, creator of the bangus since it can be enjoyed any time. The ice cream was a big hit during a recent food exhibit at a local university. The ice cream ingredients include steam bangus meat, condense milk, all purpose cream, fresh milk and cheese. (News abc-cbn.com)

An additional discovery by a local researcher was the development of a calcium-enriched "polvoron," a Filipino powder-based delicacy, using powdered milkfish (bangus) bones to decrease waste materials from fish deboning and prevent diseases such as osteoporosis due to calcium deficiency. The study entitled "Formulation and Acceptability of Calcium-Enriched Polvoron" was conducted by Dr. Aurora Afalla, extension facilitator of the Institute of Fisheries of the Don Mariano Marcos Memorial State University in La A Union (www.highbeam.com) Milkfish and tuna are the most internationally and locally traded fishes in the Philippines. Both species are processed as canned or bottled; chilled and frozen, although the former is primarily utilized for sashimi and sushi productions. Practically, all stages involved in the manufacturing processes can provide huge volumes of by-products, accounting to more than 50% of the fish body weight. These by-products contain nutritionally important substances e.g. proteins, omega-3 fatty acids, vitamins, minerals and other bioactive substances in quantities that are comparable or even better than those found in the prime meats (Panggat, 1998, Hearn et.al. 1987; Saito et.al. 1996; Panggat and Shindo 2003)

Filipinos who had adopted some of their culture somewhere, as related by Henares (2009). Added that though longganisa did not originate in the Philippines, they had developed quite an interest to the dish and developed a variety of flavors for it depending on what town it will come from. According to Belen (2011) thus emerged Bangus by product which gained popularity in the country.

Value-added tuna and milkfish products commonly produced in the Philippines include sausages (Longganisa's and hot dogs); fish balls, embutido, tocino, nuggets, burgers, spring rolls, quikiam and skin crispier among others. Tuna black meat that normally exhibits a strong flavor may however, be used as raw material for making high- jellied products e.g. chorizo and ham. Collaborative effort between the government and the entrepreneurs is deemed necessary in order to increase efficiency and productivity. New scientifically- derived formula e.g. restructured milkfish fillets, terrine, ham, fish rolls, and other ready-to-eat and ready-to-cook foods must be well disseminated and employed. Appropriate post-harvest technologies including packaging and marketing as well as quality and safety management are important concerns that must also be addressed.

Research Design and Methodology

Research Design

The researchers utilized the experimental Method in order to collect data to test the hypothesis and answer questions regarding the problem of the study. The research was purposely done to determine the acceptability of Milkfish Longganisa by substituting meat, chicken, pork with flaked or ground Milkfish

Methodology

A tasting panel was selected to test the sample product of Milkfish (Chanos-Chanos) Longganisa with the use of a Likert scale rating/evaluation sheet.

Respondents/Participants of the Study

The respondents of the study were 10 BSHRM students of Northern Iloilo Polytechnic State College, 10 Lovely Members of NIPSC Ajuy Campus and 10 parents of student from NIPSC Ajuy Campus who were purposely selected by the researcher.

Purposive sampling was employed in choosing the respondents with the following qualifications; for students; 4th year BSHRM, NIPSC Ajuy Campus, graduating this school year 2018-2019 and for Faculty Members of NIPSC Ajuy Campus and parents of students of NIPSC Ajuy, at least 25-45 years of age.

Data Gathering Instruments and Technique

Score	Scale	Verbal Interpretation
5	4.21-5.00	Highly Acceptable
4	3.21-4.20	Very Acceptable
3	2.61-3.20	Acceptable
2	1.81-2.60	Fairly Acceptable
1	1.00-1.80	Not Acceptable

Research Procedure

The researchers had two phases for the study: the first phase was the standardization of Milkfish Longganisa and the second phase was the evaluation of the Milkfish Longganisa.

The first phase of standardization was done by the researchers in the HRM laboratory. After a series of dry runs and experiments, final formulation of Milkfish Longganisa was standardize. A number of tools and ingredients were also gathered earlier to determine the actual cost of the recipe and prove that the Development and Economic Viability of Milkfish (Chanos-Chanos) Longganisa would come out positively.

Materials and Ingredients for the Preparation

All necessary tools and materials/ingredients were gathered as follow:

Knife	Flaked 3 kilos boneless bangus
Chopping board	Ground black pepper
Working table	Vinegar
Trays	Achuete
Mixing bowls	Garlic
Plates	Soy sauce
Cups	sugar
Teaspoon	2x10 plastic polybags
Tablespoon	Funnel

Method of preparation

All the ingredients were mixed will and combined with the finely flaked bangus in a small basin. It was allowed to stand for the moment so that the bangus will absorb all the mixture.

45 Polybags were filled with the prepared mixture and boiled in order to be molded. As soon as they were done and become whole, they were left to cost, removed from the plastic and fried until light brown.

Method of Presentation and Tasting/Testing

The fried Milkfish Longganisa were divided for tasting/testing and evaluation by cutting into several pieces for the evaluation/respondents to taste and record on the Evaluation Sheet. The results were given back to he researchers for final evaluation and recording of the Development and Economic Viability.

Cost Incurred in the Preparation of Milkfish Longganisa

Milk fish-3 kilos flaked-	P 500.00
Mixture plus Miscellaneous-	P 200.00
Investment -	P 700.00
45 pieces wrapped longganisa	
(9 packs of 5 pieces) 9 packs X 100/pack =	P 900.00
Deduct expenses	P 700.00
	P 200.00 Profits

Preparation 1 cup marinade/1 kilo bangus flaked + solid ingredients.

The more numbers of kilos prepared the lesser the proportion of expenses to be incurred which means that the production or development of Milkfish (Chanos-Chanos) Longganisa's Economic Viability is very Highly Acceptable in Nutritive value, as a replacement for chicken and pork or any other meat products and as an income penetrating source for business.

Result and Discussions

This chapter dealt with the findings and analysis of the researcher on the Development and Economic Viability of Milkfish (Chanos-Chanos) Longganisa in three treatments based on Color, Aroma, Texture, Taste and General Acceptability.

Table were structured showing the frequencies and percentage of scores by the three groups of participants/respondents, who are 10 students, 10 members of faculty, and 10 parents of students, from NIPSC, Ajuy Campus during the school year 2018-2019.

The Likert Scale was used to analyze the degree of acceptability of each rating of 5-Highly Acceptable; 4- Very Acceptable; 3- Acceptable; 2- Fairly Acceptable and 1- Not Acceptable.

The following three Treatment divided in tables show the scores as rated by the researchers, with F= Frequency and P= Percentage.

Table 1.A Frequency Distribution of Respondents as to Color of Milkfish Longganisa

TREATMENT A	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	2	20%	4	40%	3	30%	1	10%			10
Faculty	1	10%	4	40%	5	50%					10
Parents	3	30%	5	50%	2	20%					10
Total	6	20%	13	43.4%	10	33.84%	1	3.34%			

Table 1.A Show that the students rating of 4 or 40% paired for Very Acceptable, 4 or 40% very acceptable for teachers and 5 or 50% Very Acceptable to parents, while 5 or 50% of

the members of the faculty favored rank 3 or Acceptable. So, in color for the first treatment the three groups paired for 4, Very Acceptable.

Table 1.B Frequency Distribution of Respondents as to Color of Milkfish Longganisa

TREATMENT B	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	1	10%	3	30%	5	50%	1	10%			
Faculty	2	20%	4	40%	4	40%					
Parents	3	30%	5	50%	2	20%					
Total	6	20%	12	40%	11	36.7%	1	3.34%			

As show on Table 1.B of Color frequency the Highest score s 5 or 50% Very Acceptable among parents, and students

gave 5 or 50% score of Acceptable. The total of 12 respondents however favored Very Acceptable out of the 30.

Table 1.C Frequency Distribution of Respondents as to Color of Milkfish Longganisa

TREATMENT C	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	1	10%	3	30%	6	60%	1	10%			
Faculty	2	20%	4	40%	4	40%					
Parents	3	30%	4	40%	3	30%					
Total	6	20%	10	33,34%	13	43.4%	1	3.34%			

In Treatment C, the highest is from students with 6 or 60% out of favoring Acceptable, followed by 4 or 40% among the faculty and 4 or 40% among parents Very Acceptable.

The total score of the 30 respondents was 13 or 43.4% in favor of Acceptable.

Table 2.A Frequency Distribution of Respondents as to Aroma of Milkfish Longganisa

TREATMENT A	RATINGS										TOTAL
	5		4		3		2		1		
	F	%	F	%	F	%	F	%	F	%	
Participants/Respondents											
Students	2	20%	5	50%	2	20%	1	10%			
Faculty	1	10%	5	50%	4	40%					
Parents	3	30%	4	40%	3	30%					
Total	6	20%	14	46.76%	9	30.6%	1	3.34%			

In Aroma, Table 2.A or Treatment A, students scored 5 or 50% for Very Acceptable, as well as Faculty also 5 or 50%

of the member want for Very Acceptable. In total of the 30 respondents, 14 46.76% favored Very Acceptable.

Table 2.B Frequency Distribution of Respondents as to Aroma of Milkfish Longganisa

TREATMENT B	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	1	10%	5	50%	4	40%					10
Faculty	1	10%	5	50%	4	40%					10
Parents	3	30%	4	40%	3	30%					10
Total	5	16%	14	46.76%	11	36.74%					

For the second Treatment, as shown in Table 2.B, students and faculty both gave their scores of 5 or 50% each to Very

Acceptable, thereby giving a score of 14 or 46.76% among the 30 respondents

Table 2.C Frequency Distribution of Respondents as to Aroma of Milkfish Longganisa

TREATMENT C	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	2	20%	3	30%	5	50%					10
Faculty	2	20%	4	40%	4	40%					10
Parents	3	30%	4	40%	3	30%					10
Total	7	23.38%	11	36.76%	13	43.4%					

In Table 2.C, Aroma, faculty and parents gave their scores of 4 or 40% each in their individual's groups, while students

gave a score of 5 or 50%, resulting to a total of 13 out of the 30 among the respondents in favor of Acceptable.

Table 3.A Frequency Distribution of Respondents as to Texture of Milkfish Longganisa

TREATMENT A	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	2	20%	6	60%	2	20%					10
Faculty	1	10%	3	30%	4	40%	2	20%			10
Parents	3	30%	5	50%	2	20%					10
Total	6	20%	14	46.76%	8	26.72%	2	20%			

In texture, Table 3.A, Treatment A, students scored 6 or 60% for Very Acceptable followed by parents 5 or 50% also

Very Acceptable, thereby garnering a total of 14 or 46.76% in favor of Very Acceptable.

Table 3.B Frequency Distribution of Respondents as to Texture of Milkfish Longganisa

TREATMENT B	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	2	10%	4	40%	4	40%	1	10%			10
Faculty	1	20%	4	40%	3	30%	1	10%			10
Parents	4	40%	5	50%	1	10%					10
Total	7	23.38%	13	43.4%	8	26.72%	2	6.68%			

In Table 3.B of Texture, Treatment B, students voted for 2 members, but defeated by favor or 5 or 50%, Very Acceptable by 4 or 40%, also 4 or 40% of faculty members, but defeated by favor or 5 or 50%, Very Acceptable to the parents.

Table 3.C Frequency Distribution of Respondents as to Texture of Milkfish Longganisa

TREATMENT C	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	2	20%	3	30%	4	40%	1	10%			10
Faculty	2	20%	5	50%	3	30%					10
Parents	3	30%	4	40%	3	30%					10
Total	7		12		10						

In Treatment C, Table 3.C of Texture, 5 or 50% of faculty members fared for Very Acceptable, followed by the parents, 4 or 40%, Very Acceptable resulting to 12 or 40.08% out of the 30 respondents favoring Very Acceptable.

Table 4.A Frequency Distribution of Respondents as to Taste of Milkfish Longganisa

TREATMENT A	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	5	50%	4	40%	1	10%					10
Faculty	1	10%	5	50%	4	40%					10
Parents	4	40%	5	50%	1	30%					10
Total	10	33.34%	14	46.76%	6	20%					

As to taste, Treatment A or Table 4.A, the 5 or 50% of students gave a Highly Acceptable remark for the taste of Milkfish Longganisa, however, due to 5 or 50% of faculty members and 5 or 50% of parents favored Very Acceptable and 4 or 40% of students also fared with them, 14 or 46.76% of the respondents scored for Very Acceptable.

Table 4.B Frequency Distribution of Respondents as to Taste of Milkfish Longganisa

TREATMENT B	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	3	30%	3	30%	4	40%					10
Faculty	1	10%	4	40%	4	40%	1	10%			10
Parents	4	40%	5	50%	1	10%					10
Total	8	26.72%	12	40.8%	9	30.06%	1	3.34%			

In Treatment B, Table 4.B on Taste, 5 or 50% of parents were Very Acceptable of the taste, joined by 4 members of the faculty. So the total scores for the respondents were 12 or 40.08% in favor of Very Acceptable.

Table 4.C Frequency Distribution of Respondents as to Taste of Milkfish Longganisa

TREATMENT C	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	3	30%	3	30%	4	40%					10
Faculty	1	10%	4	40%	4	40%	1	10%			10
Parents	4	40%	5	50%	1	10%					10
Total	8	26.72%	12	40.8%	9	30.06%	1	3.34%			

Table 4.C, Treatment C or Taste earned 5 or 50% score from the faculty, 5 or 50% from the parents to earn a total of 13 or 43.4% or Very Acceptable in their favor.

Table 5.A Frequency Distribution of Respondents as to General Appearance of Milkfish Longganisa

TREATMENT A	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	3	30%	6	60%	1	10%					10
Faculty			5	50%	5	50%					10
Parents	4	40%	5	50%	1	10%					10
Total	7	23.38%	16	53.4%	7	23.38%					

Table 5.A gave the results as regards to General Acceptability this time a mark of 6 or 60% of 10 students marked in favor of Very Acceptable, 5 or 50% from the faculty and 5 or 50% from the parents. So, Very Acceptable was the resultant rating of 16 or 53.47%.

Table 5.B Frequency Distribution of Respondents as to General Appearance of Milkfish Longganisa

TREATMENT B	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	1		4		4		1				10
Faculty	2		4		4						10
Parents	4		4		2						10
Total	7		12		10		1				

In the second treatment of General Acceptability, Table 5.B earned a flat 4 or 40% each of the group of students, faculty and parents gathering a total of 12 or 40.08% of the overall respondents, thereby giving a remark of Very Acceptable in Rating 4.

Table 5.C Frequency Distribution of Respondents as to General Appearance of Milkfish Longganisa.

TREATMENT C	RATINGS										TOTAL
	5		4		3		2		1		
	F	P	F	P	F	P	F	P	F	P	
Participants/Respondents											
Students	1		4		4		1				10
Faculty	3		4		3						10
Parents	4		5		1						10
Total	8		13		8		1				

In Table 5.C Treatment 5, students gave a score of 4 or 40% to rating or Very Acceptable, 4 or 40% of faculty members and 5 or 50% by the parents of the total respondents 13 or 43.4% was garnered the highest score for Very Acceptable.

Based from the ratings given by the 10 students, 10 faculty members and 10 parents, their total scores recorded the following findings and interpretations from the three treatments.

Table 6. Average Color Rating

	RATINGS					Average Ratings
	5	4	3	2	1	
Respondents						
Students	1.0	1.73	1.0	0.07	0	3.0
Faculty	1.0	1.60	1.1	0.07	0	3.77
Parents	1.0	1.33	1.30	0.07	0	3.70
Grand Total						11.27
Grand Mean						3.76

The result revealed that Milkfish Longganisa under Rating 4 had the highest average effect on the total group of respondents with the ratings of 3.80 for students, 3.37 for

faculty members and 3.70 for the parents. The grand mean is 3.46 which is Very Acceptable for the respondents.

Table 7. Average Aroma Rating

	RATINGS					Average Ratings
	5	4	3	2	1	
Respondents	5	4	3	2	1	
Students	1.0	1.87	1.0	0.07	0	3.44
Faculty	0.83	1.87	1.0	0	0	3.80
Parents	1.17	1.47	1.3	0	0	3.74
Grand Total						11.68
Grand Mean						3.89

The table showed that the total respondents are agreeable to rank 4 being Very Acceptable with 1.73 for students, 1.73 for faculty members and 1.73 for parents, garnering a 3.89 aroma effect.

Table 8. Average Texture Rating

	RATINGS					Average Ratings
	5	4	3	2	1	
Respondents	5	4	3	2	1	
Students	1.0	1.87	1.0	0.13	0	4.0
Faculty	1.17	1.75	0.80	0.13	0	3.83
Parents	1.17	1.73	1.0	0.13	0	3.97
Grand Total						11.80
Grand Mean						3.93

The table revealed that the whole group of respondents found out that the texture was Very Acceptable, ranked 4 with a grand mean of 3.93.

Acceptable Scale, 1.73 also Very Acceptable and 1.60 Very Acceptable for students. With a grand mean of 4.90, the taste of the Developed Milkfish Longganisa is rated Highly Acceptable.

Table 9. Average Taste Rating

	RATINGS					Average Ratings
	5	4	3	2	1	
Respondents	5	4	3	2	1	
Students	5.0	1.87	0.6	0	0	6.93
Faculty	1.33	1.60	0.9	0.07	0	3.90
Parents	1.17	1.73	0.9	0.07	0	3.87
Grand Total						14.70
Grand Mean						4.90

Table 9 topped the findings of the students with 5 or Highly Acceptable on the rating scale, followed by 1.87 on the Very

Table 10. Average General Appearance Rating

	RATINGS					Average Ratings
	5	4	3	2	1	
Respondents	5	4	3	2	1	
Students	5.0	1.87	0.6	0	0	6.93
Faculty	1.33	1.60	0.9	0.07	0	3.90
Parents	1.17	1.73	0.9	0.07	0	3.87
Grand Total						14.70
Grand Mean						4.90

The table revealed that respondents rated more on rank for/or Very Acceptable as shown in the rating scale. However, the highest score of 3.0 went to 3 or Acceptable. Due to the grand mean of 4.38, the General Appearance of Milkfish Longganisa is Highly Acceptable. Summing up all the Grand Average ratings;

- Color – 3.76 Very Acceptable
- Aroma – 3.9 Very Acceptable
- Texture – 3.93 Very Acceptable
- Taste – 4.90 Highly Acceptable
- General Appearance – 4.38 Highly Acceptable
- $5/20.86 = 4.14$ which is Very Acceptable

Summary, Conclusion and Recommendation

Summary

This Thesis entitled Development and Economic Viability of Milkfish Longganisa was conducted by the graduating BSHRM Students of NIPSC Ajuy Campus for the school year 2018-2019. Hey wanted to prove the acceptability of developing bangus or Milkfish whether it could be viable to the economy and acceptable to the population based on Color, aroma, texture, taste and general appearance. 10 students, 10 faculty members and 10 parents were the respondents of the survey using the Likert Scale. According to their findings the acceptability of Longganisa was Very Acceptability at 4.14 to all the respondents which answered the problem number 1. It was also found out that there were no significant differences as to color, aroma, texture, taste and general appearance. To sum it all the Development of Milkfish (Chanos-Chanos) Longganisa would prove an Economically Viable food for

the population and could be a good business for fishpond helpers, housewife, small scale business owners and anyone who wants to generate income through the Milkfish Industry.

Conclusion

Based from the foregoing research on the Development and Economic Viability of Milkfish Longganisa, the researchers found out that aside from the benefits which bangus coned provide for the health of the people, it could supply more employments to the residents. It could as well take the place or substitute for chicken and pork, the prohibited food for the people with hypertension, diabetic complications and other serious deceases.

The addition of Milkfish Longganisa to the tables contributes to the nutrients and delicious meal for picky children and adults. As a source of protein and micro protein many people could avoid cancer and other dangerous illnesses. Bangus and its by products are also advisable for pregnant women, children and non-meat and pork eating individuals.

In reality, this research was tasted with only one mixture of bangus with other ingredients so, the researchers need not compare the treatment but only evaluate if the color, aroma, texture, taste and general acceptability/appearance would positively be acceptable for Economic Viability.

Furthermore, the capital investment was minimal and the expected return once introduced as a business could acquire sufficient profit. The research which resulted to 4.14 in the scale of weighted mean was a result of:

- Color – 3.75 – Very Acceptable
- Aroma – 3.87 – Very Acceptable
- Texture – 3.93 – Very Acceptable
- Taste – 4.90 – Highly Acceptable

General Appearance - Highly Acceptable

$$\frac{5}{20.87} = 4.15$$

It thus coned generate income and provide benefits to producers, helpers, retailers and wholesalers of bangus all over Ajuy, markets and the country as a whole.

Recommendation

The researcher recommends to everyone to consume Milkfish (Chanos-Chanos) Longganisa for their protein and micro protein requirements in the diet to avoid diseases like cancer and diabetes. Milkfish (Chanos-Chanos) Longganisa are also recommended for pregnant mothers, children and those who are non-meat and pork eating members of the population

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