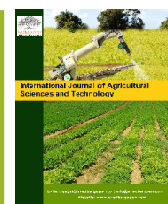




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## Commercial Production of Fish Squash Patties Utilizing Local Milkfish (Bangus)

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### Abstract

Manufacturers appear to be cognizant of the necessity of launching new product innovations nowadays. The health advantages of milkfish are another reason to consume it. In response to the product innovation challenge, the commercial manufacture of Fish Squash Patties using local Milkfish (*Chanos-chanos*) was considered. The purpose of this research was to create Fish-Squash Patties using native Bangus (*Chanos-chanos*). The Department of Science and Technology (DOST) examined the product utilizing Sensory Evaluation and Microbiological Analysis. Following that, the researchers conducted a taste test and distributed questionnaires assessing the acceptability of the following factors: appearance, scent, taste, and texture. Bangus and Squash have been discovered to work well together as components for patties. The production of patties done by the researcher have made the Fish-Squash Patties safe of consumption since it PASSED the microbiological analysis conducted at DOST Laboratory BulSU Main Campus, City of Malolos, Bulacan in compliance with the BFAD standards.

**Keywords:** *Chanos-chanos, Fish production, Product development, Commercial production, Small and medium sized enterprise*

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### 1. Introduction

Bulacan, Philippines is blessed with rich common assets in light of its bounteous items like fish. A portion of these fish are accessible the entire all year, and from among the fishes, Bangus or “*Chanos-chanos*” has the largest supply. At the point where there is so much supply, these fish end up less expensive and an oversupply sometimes results to a great loss to the fisher folks particularly in the town of Hagonoy, which is home to around 1,423 fishpond administrators and 55 enrolled consignations. Product development of Milkfish had been assumed to be a solution to the problem of some fisher folks, fishpond administrators and SME’s.

Recent findings in a shows that there is a wide selection of milkfish product produced in the Philippines, yet still seems to be very inadequate in terms of product diversity (Panggat *et al.*, 2019). Almost all products are practically the same. There seems to be no concerted efforts to expand and introduce new products. The SMEs, specifically have very limited funds and competencies to engage in concentrated product innovations.

Meeting the fish business is similarly as troublesome as satisfying the consumers need for new product advancements, improved packaging and product variations. Product development has always been anticipated to thrive in Bulacan,

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Philippines. The accessibility to aquatic resource, low-cost manpower and somewhat lower utility rates in the region increases the development of the industry. Nowadays, the manufacturers seem to be aware of the importance of promoting new product innovations. The health benefits in milkfish is also an advantage for utilization. As response with the challenge of product innovation, the commercial production of Fish Squash Patties utilizing local Milkfish (*Chanos-chanos*) had been put into consideration.

This study sought to develop Fish-Squash Patties utilizing local Bangus (*Chanos-chanos*). It intended to answer what are the ingredients and the process needed in the utilization of Fish-Squash patties, how do microbiological standards of Fish-Squash patties be evaluated in terms of its aerobic plate count, coliform count, *Escherichia coli* count, *Listeria monocytogenes*, and *Staphylococcus aureus* count, and how acceptable are fish-squash patties through sensory quality in terms of its appearance, aroma, taste and texture.

## 2. Methods

The fisher folks, fishpond administrators and SME's within the town of Hagonoy in the province of Bulacan, Philippines were the respondents of this study. The 100 respondents were chosen through convenience sampling method.

The product was tested by the Department of Science and Technology (DOST) using the Sensory Evaluation and Microbiological Analysis. After which, the researchers conducted a taste test and administered self-constructed questionnaire which included acceptability of the following: appearance, aroma, taste and texture.

There are assortments of patties these days like beef patties, pork patties, chicken patties and other delicious fixings that effectively grab the eye of the customers. The researchers build up the item so the buyer can appreciate the essence of Milkfish (*Chanos-chanos*) and Squash (*Cucurbita moschata*) Patties in the meantime it gives another unmistakable flavor and for its dietary benefit.

The item proposition is Fish (*Chanos-chanos*) and Squash (*Cucurbita moschata*) patties. The blend of Fish (*Chanos-chanos*) and Squash (*Cucurbita moschata*) is another idea that the researcher seek after due to its stimulating advantages and extraordinary flavor combinations.

The main ingredients of Fish Squash patties are: Flaked bangus, grated squash. Refined salt, phosphate, chilled water, TVP powder, carrageenan, isolate, chilled water, refined sugar, MSG, garlic chopped, BF blend, black pepper, meat enhancer, onion chopped, hamburger seasoning, milk, eggs, and bread crumbs.

In making Fish-Squash patties, the milkfish (*Chanos-chanos*) boiled with lemon grass for 5 min, rest it for 2-3 min and flake it. In a mixing bowl, add the flaked fish meat, refined salt, phosphate and chilled water. Mix until translucent appearance is attained. Add TVP powder, carrageenan, isolate, and chilled water. Continue mixing for 5 min to obtain a homogenized mixture. Add refined sugar, MSG, black pepper, garlic chopped, BF blend, meat enhancer, onion chopped, hamburger seasoning, milk, eggs, bread crumbs and grated squash. Refrigerate for 20 min then form into patties.

## 3. Results

From the analysis of the data presented in the study, the following results were acquired.

1. The ingredients used in the preparation of Fish Squash Patties are flaked bangus, ground squash, refined salt, phosphate, chilled water, TVP powder, carrageenan, isolate, chilled water, refined sugar, MSG, baking powder, garlic chopped, BF blend, black pepper, meat enhancer, onion chopped, hamburger seasoning, milk, eggs, and bread crumbs. The process used in the preparation was mixing of all ingredients, forming into patty and refrigerate for 20 min, simmering and packaging.
2. The tested sample of Fish Squash Patties under Aerobic plate count (Less than  $10^4$  cfus/g sample), *Coliform* count (Less than  $10^2$  cfus/g sample), yeast and molds count (Less than 10 cfus/g sample), *Escherichia coli* count (Less than 10 cfus/g sample), and *Salmonella* determination (negative) had passed all the parameters of the microbiological quality. The researchers have used patters in which it may not trigger any positive sign of bacteria and other microorganism. It was then made by strictly sanitizing all utensils and raw materials.
3. The level of acceptability on the sensory quality of Fish-Squash Patties based on evaluation of one hundred (100) respondents on the Fish-Squash Patties: Appearance with the weighted mean of 4.36 was accepted, aroma with the weighted mean of 4.7 was accepted, Taste with the weighted mean of 4.71 was very acceptable. The total weighted mean from the level of acceptability of all respondents was 4.6226 and interpreted as very acceptable.

#### 4. Discussion

It has been found out that Bangus (*Chanos-chanos*) and Squash (*Cucurbita moschata*) can be utilized together as ingredients for Patties. The production of patties done by the researcher have made the Fish-Squash Patties safe of consumption since it PASSED the microbiological analysis conducted at DOST Laboratory BulSU Main Campus, City of Malolos, Bulacan in compliance with the BFAD standards.

The Fish Squash patties, as per asses of respondents, are both acceptable in terms of sensory quality such as appearance, aroma, taste and texture. For the development of this product, the researchers recommend other ideas and factors for improving the study as well as a foundation for new or future researches.

As perceived by Marcel *et al.* (2015), finished product testing may be viewed as a quality control method at the end of the manufacturing process. However, testing provides only a very limited amount of information about a food's safety status. Therefore, subsequent microbiological analyses of sample may be conducted to monitor microbiological quality of samples preferably within 12 months' period to comply with the standards set by Department of Health. Subsequent evaluation on a more diverse population to produce patties with different flavors like spicy, sweet, etc. It is also recommended to make the packaging environment friendly, and to have a several packaging staff.

Sehgal *et al.* (2009), investigated six various types of fish patties that were made from deboned meat of an Indian major carp, Labeorohita, in three weight groups (250-500 g, 501-750 g, and 751-1,000 g), utilizing two enhancers (cornflour and boiled potato). Total plate count indicated that such patties were safe (from the microbiological standpoint) for up to an 80-day storage period and this study, although utilizes a different kind of fish, had proven this to be accurate. Therefore, the researches agree with the findings of Sehgal *et al.* (2009). Also, for use in school food programs, plain and seasoned prepared skipjack tuna patties with textural properties comparable to ground beef were produced. According to Iwaoka and Akamine (2010), the nutritious content of raw and cooked fish patties maintained in freezer storage for nine months remained roughly the same, according to shelf life tests. Raw and cooked tuna patties comprised 71% to 75% moisture, 18% to 21% protein, 0.15% to 0.22% fat, 1.8% to 2.1% ash, and 3.3% to 4.0% carbohydrate in a 100 g edible portion. The average calorie content per patty was 88 to 91 kcal/patty. In addition, a 100 g patty served supplied around 29% of the US. RDA for protein is 18%-20%, phosphorous is around 14%, iron is 10%-11%, magnesium is 6%, zinc, copper, and manganese are less than 5%, thiamin is about 2%, and vitamins A, E, and calcium are less than 2%. Sensory research on fish patties revealed that cooked patties may be frozen for up to nine months (at minus 24°C) with very minor odor, taste, and texture alterations. The frozen, uncooked patties looked to have a three-month shelf life. If indeed the patties have been frozen raw, they should be cooked and consumed within three months. Furthermore, according to their findings. The tuna patties should be thoroughly cooked, frozen rapidly, vacuum-sealed, and kept at -24 °C or lower to preserve a frozen shelf-life of up to nine months. Fish Squash patties were prepared and devoured right away; they had not been tested to see how long they could be kept. As a result, it is suggested that Fish Squash patties be submitted to further shelf life testing.

#### 5. Conclusion and Recommendation

The findings of this study show that Bangus (*Chanos-chanos*) and Squash (*Cucurbita moschata*) can be used together as ingredients in patties. Therefore, it is concluded that aside from being a source of income, this product development can help to solve the oversupply of Bangus (*Chanos-chanos*) while also reducing food waste.

Although the study only used Bangus (*Chanos-chanos*) and Squash (*Cucurbita moschata*) as patty ingredients, more research on other ingredients is suggested. Other researchers can also conduct additional research on marketability and acceptability.

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