



NUTRITIONAL COMPOSITION OF AMOY CROAKER (ARGYROSOMUS AMOYENSIS) AS A RAW MATERIAL FOR FISHERIES PRODUCT

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KeyWords

Argyrosomus amoyensis, proximate, raw materials, surimi, fishery products, nutritional composition, Pangandaran

ABSTRACT

Amoy Croaker (*Argyrosomus amoyensis*) is a type of demersal fish found in Pangandaran waters, West Java, Indonesia, which has the potential as a source of nutritious food for the people. This research aims to determine the nutritional composition of Amoy Croaker (*Argyrosomus amoyensis*) originating from Pangandaran waters, West Java, Indonesia. This research was conducted in 3 stages, namely the first stage of preparing materials in the form of fresh fish, the second stage namely preparation of surimi and the third stage namely analysis. The data obtained were analyzed descriptively. The results showed that the Amoy Croaker (*Argyrosomus amoyensis*) originating from Pangandaran waters was included in the fish group with high protein and low fat categories. The nutritional content of Amoy Croaker (*Argyrosomus amoyensis*) includes water content of 78.94 ± 0.48 g / 100g, ash content of 2.83 ± 0.01 g / 100g, fat content of 0.86 ± 0.18 g / 100g and protein content of 15.97 ± 0.31 g / 100g. Amoy Croaker can also be used as an alternative source of raw materials for processed fishery products.

INTRODUCTION

Fisheries products are popular with people because they taste good and have good nutritional content, especially high protein content. Fish is a good source of key nutrients such as highly bioavailable animal protein [1]. Fish plays an important role in fulfilling the source of nutrition and life security for humans in developing countries [2]. Demersal fish protein content is higher than pelagic fish.

Gulamah fish or Amoy Croaker (*Argyrosomus amoyensis*) is a type of demersal fish found in Pangandaran waters, West Java, Indonesia. This fish is caught a lot, when the catch is abundant the price is very cheap and not utilized optimally. In fact, Amoy Croaker (*Argyrosomus amoyensis*) has the potential as a source of nutritious food for the people. Amoy Croaker can actually be processed into various processed products to increase their added value and can be used as a source of raw material in the fish jelly product industry because it is a demersal fish which is rich in protein. Furthermore, because it is a fish that has low economic value, it is very appropriate if it is used as raw material for processed fishery products which can affect production cost savings.

Fish is generally a highly perishable food. Thus, an effort is needed to determine the characteristics of Amoy Croaker (*Argyrosomus amoyensis*) from the nutritional composition of the fish, namely the proximate composition of fresh fish and the

proximate composition of surimi as raw materials for fishery products. This information is indispensable for the use of Amoy Croaker (*Argyrosomus amoyensis*) in meeting community food needs. This study aims to determine the nutritional composition of Amoy Croaker (*Argyrosomus amoyensis*) originating from Pangandaran waters, West Java, Indonesia.

MATERIAL AND METHOD

This research was conducted from May to August 2019 at the Fishery Products Processing Laboratory, Universitas Padjadjaran. The materials used in this study were fresh Amoy Croaker (*Argyrosomus amoyensis*) from Pangandaran waters (20-25 cm of fresh fish were obtained from the Cikidang Pangandaran Fish Landing Base (PPI)), water, ice, packing materials, and chemicals used for chemical analysis. The tools used in this study include knives, cool box, cutting boards, analytical scales, porcelain plates, measuring cups, refrigerators, kjedhal distillates, soxlet, fat flasks, and oven.

METHOD

This research was conducted in 3 stages, namely the first stage of preparing the ingredients in the form of fresh Amoy Croaker (*Argyrosomus amoyensis*), the second stage namely preparation of surimi (Suzuki, 1981), and the third stage namely analysis.

a. Preparing materials in the form fresh Amoy Croaker (*Argyrosomus amoyensis*)

Samples were taken fresh. The fish is packed in a cool box with ice in it. Ice is on the bottom, sides and top of the cool box. Transported to the laboratory and when they arrive at the laboratory, the fish are washed with ice water (temperature 5-10°C), drained and the meat samples are taken for analysis.

b. Preparation of surimi [3]

Fish meat is ground using a grinder. After that the fish meat was washed twice using cold water with temperature $(15 \pm 1)^{\circ}\text{C}$ and a salt solution of 0.3% (w / w). The first wash with cold water (water: meat ratio is 3: 1) is carried out for 10 minutes. The fish meat is then squeezed using a filter cloth to remove the water. The second soaking with a salt solution of 0.3% (w / w) (the ratio of the volume of salt solution: meat is 3: 1) for 10 minutes, then filtered again using a cloth while squeezing. Surimi was put into polyethylene plastic and stored in a freezer, then analyzed.

c. Analysis

The analysis was carried out were proximate analysis of fresh fish and surimi [4], testing the pH value and Total Volatile Base (TVB) using the Conway dish method, and analysis of whiteness to determine the brightness of fish meat.

Proximate analysis. Water content was measured by drying a sample of shrimp meat in an oven at 105 °C for 16 hours until the weight was constant. Crude protein content was analyzed by Kjeldahl method. Crude fat content was extracted with a 40-60°C boiling point petroleum ether. Ash content is measured by heating at 550°C for 4-5 hours using a muffle furnace [4].

Testing the pH value. The pH test is carried out after the pH meter is calibrated first with pH 4 and pH 7. The sample is prepared and the temperature is measured, then the pH meter temperature control is set at that temperature. The pH meter stabilization is carried out for 15-30 minutes. After that, the electrodes were rinsed with distilled water and dried. The electrode is immersed in the sample solution and the pH measurement can be set. The electrode is allowed to immerse for a while until a stable reading is obtained, then the pH of the sample can be recorded.

Analyze the whiteness of the fish meat. Color measurement objectively using Chromometer CR200 with Hunter notation system (L^*). The value of L^* is the brightness parameter, represents the reflected light that produces white, grey, and black achromatic colors. L^* value range from 0 (black) to 100 (white).

RESULT AND DISCUSSION

Proximate Composition of Fresh Amoy Croaker (*Argyrosomus amoyensis*) and Surimi

Amoy Croaker (*Argyrosomus amoyensis*) live in coastal waters, in large groups, can reach a length of 38 cm, generally 25-30 cm. Classified as demersal fish, caught mainly by trawling, cantrang and the like, various kinds of edge trawls, gill nets and fishing rods,

marketed in fresh, salted-dried and salted-boiled forms [5]. Amoy Croaker (*Argyrosomus amoyensis*) used in this research were fish obtained from Pangandaran waters with a size between 25-30 cm, presented in **Figure 1**.



Figure 1. Gulamah Fish or Amoy Croaker (*Argyrosomus amoyensis*)

The results of the proximate analysis Amoy Croaker (*Argyrosomus amoyensis*) obtained from Pangandaran waters are presented in Table 1. and the results of the proximate analysis of the surimi of Amoy Croaker (*Argyrosomus amoyensis*) are presented in Table 2.

Table 1. The average of the proximate analysis value of fresh Amoy Croaker (*Argyrosomus amoyensis*)

Composition	Value (g/100g wet matter)
Water	78.94±0.48
Ash	2.83±0.01
Fat	0.86±0.18
Protein	15.97±0.31

Table 2. The average of the proximate analysis value of Amoy Croaker (*Argyrosomus amoyensis*) Surimi

Composition	Value (g/100g wet matter)
Water	80.16±0.28
Ash	2.71±0.12
Fat	0.64±0.33
Protein	15.58±0.25

Water is the largest constituent component in the fish body. The water content in fish comes in two forms, namely free water and bound water. Water content in food materials greatly affects the quality and storage capacity of the food [6]. The water content contained in fish meat and surimi of Amoy Croaker (*Argyrosomus amoyensis*) is not too high. The water content of surimi is higher than that of fresh fish because in the process of making surimi there is a washing process, so that there is still water left during the squeezing process or partially removing water. The fat content of Amoy Croaker (*Argyrosomus amoyensis*) was 0.86 ± 0.18 g / 100g and surimi 0.64 ± 0.33 g / 100g. Fish water content is related to fat content. The higher the water content in the fish, the lower the fat content (Suzuki 1981).

The total protein content in *Argyrosomus amoyensis* is 15.97 ± 0.31 g / 100g, the total protein content in this fish species can be assumed to be of high dietary quality, being an animal source protein [7]. Amoy Croaker (*Argyrosomus amoyensis*) is included in the type A group, namely the high protein (15-20%) and low fat (<5%) categories [8].

Surimi as raw material for fishery products, especially various fish jelly products, were analyzed for pH value, Total Volatile Base (TVB) and whiteness value. The pH value of frozen surimi was 6.9 ± 0.16 and the TVB value was 8.96 mgN / 100g. Based on the pH and TVB values, it can be seen that there has been a breakdown of protein during frozen storage, but the decomposition process is still running slowly and is still at an early stage. Longer storage can cause the formation of volatile compounds which can increase the pH and TVBN values. The pH value can affect the strength of the gel. The strength of the gel will be high if the pH of the meat ranges from 6.0 to 7.0, this is because myosin dissolves easily in that pH range [9]. The surimi analyzed in this study showed very fresh surimi, so that if it is used as a raw material in the manufacture of fishery products, especially fish jelly products, it can produce high gel strength.

The TVBN value of surimi is less than 10 mgN / 100g so it is included in the very fresh fish category [10]. The content of TVB is influenced by the degradation of proteins and their derivatives by microorganisms that produce the bases to evaporate. The increase in the base evaporates begins with the breakdown of proteins into amino acids by bacteria. These amino acids then undergo deamination and decarboxylation so that they become simple elements under the influence of bacterial enzymes that produce components such as ammonia, H₂S, indole, skatol, mercaptans and others [11]. Fish meat and surimi are presented in **Figure 2**.



Figure 2. Fish meat and surimi of *Argyrosomus amoyensis*

Food color is a sensory attribute that affects the quality and acceptance of food products. The L* value indicates the brightness level, representing the reflected light that produces white, gray and black achromatic colors. The L* values range from 0 (black) to 100 (white). The measurement result of the whiteness value of *Argyrosomus amoyensis* meat on a scale of 1-110 is L * 32.76%. This indicates that the fish meat has high brightness, is brilliant and shiny.

CONCLUSION

Amoy Croaker (*Argyrosomus amoyensis*) originating from Pangandaran waters, West Java, Indonesia has a good nutritional content with a protein content of 15.58 g / 100g and contains low fat, namely 0.86 g / 100g. *Argyrosomus amoyensis* can be used as a raw material for processed fishery products, because surimi can be made and after being stored frozen, the quality of the surimi is still fresh, with a pH value of 6.9 ± 0.16 and a TVB value of 8.96 mgN / 100g, and it has the appearance of flesh bright with L * 32.76% brightness value.

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