



REVIEW ARTICLES; UTILIZATION OF FISH HEAD INTO FOOD PRODUCT

By :

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Abstract

Utilization of fish heads into a useful product has been widely carried out in Indonesia both in its activities and on a research scale. This article aims to review the use of fish heads as food products in Indonesia. Based on the results of literacy, information is obtained that fish heads can be used as food products that have high added value. These products include 1) Indonesian food, fish head gule. 2) Fish head flour as a substitute for crackers products. 3) Fish head flour as a supplement for cilok. 4) Fish crackers. 5) Product flavor, food flavoring. 6) gelatin as thickener, emulsifier and stabilizer for food products such as ice cream, sausage, chocolate and various dairy products.

words : added value, sugar, cilok, crackers, crackers, food flavoring.

PRELIMINARY

Indonesia is one of the countries that has a very large level of fish production in the world. The fish production is generated from fishing activities at sea and in inland waters as well as from aquaculture activities. Fish farming activities in Indonesia are mostly carried out in inland waters such as lakes, reservoirs and ponds.

The types of fish caught and cultivated in Indonesia are fish with economic value such as tuna, skipjack, mackerel, snapper, mackerel, catfish, catfish, tilapia, gold and gourami. These fish are used as raw materials for the fish processing industry including the

fish fillet industry, mashed meat, freezing fish, fish canning and other traditional industries such as smoking and salting.

The fish processing industry activities produce waste, one of which is fish heads. The amount of fish head yield as waste from fish processing depends on the type of fish. According to Nurhayati and Warinangin (2009), fish head waste from tuna processing is 9.8 % .

Utilization of fish heads into food products is very important to do. The utilization is intended to increase the added value of fish heads, reduce negative impacts on the environment and as an effort to minimize waste production from fish processing industry activities.

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Utilization of Fish Head into gulae (local food)

The head of the fish can be processed into a typical Indonesian dish which is commonly called “Gula” or “Gule”. This dish has a characteristic yellow color and a savory taste. Fish heads commonly used in the manufacture of this curry are snapper, catfish, tilapia, and other large fish heads.

Utilizing the fish head into this gule because in the fish head there is still meat. Generally, Indonesian people really like this dish.



Figure 1. Fish Head Gule (Source: https://www.google.com/search?q=gule+head+fish,pdf&source=lnms&tbn=isch&sa=X&ved=2ahUKEwj14syRn8H6AhVqx3MBHRpyDwEQ_AUoAXoECAEQAw&biw=1366&bih=657&dpr=sk4#imgrc=IPCx1#c4M=V)

The procedure for making fish head gum is as follows: Clean the fish head, then halve it after it is soaked in the lime solution for 15 minutes. The next step is to prepare the

spices. The spices used are garlic, shallots, candlenut, coconut milk, coriander, turmeric powder, lemongrass, lime leaves and salam . and salt. lemongrass , lime leaves and bay leaf. Garlic, onion, coriander, candlenut and turmeric powder are ground until a homogeneous mixture is obtained. The next stage, the mixture is fried and mixed with coconut milk until it boils. The last step is to put the fish head, lime leaves, salam and lemongrass in the spice stew for 30 minutes.

Utilization of Fish Head as Substitute Material in Crackers Products .

Fish heads contain protein, fat and minerals such as calcium and phosphorus. The amount of this nutrient content depends on the type of fish. The content of nutrients contained in the head of this fish can be used to enrich the nutritional content of certain food products. Generally, food products that are supplemented or substituted are products that are poor in protein and calcium content.

The use of fish heads before being used for supplementation or substitution is first made into flour. According to Ferazuma et al (2011), the process of making flour from fish heads is carried out as follows: The fish head is cleaned and the gills are removed. After that, it was steamed using an autoclave at 121 °C for 2 hours so that the fish heads became softer. The cooked fish head is wrapped in gauze and pressed with a hydraulic press to reduce the water content of the fish, making it easier for the drying process. The slightly dry fish heads were dried again with a drum dryer at a temperature of 80 °C. The dried fish heads were ground with a willey mill to produce fine textured fish head flour. Furthermore, this fish head flour is packaged in a plastic bag until it is ready to be used.

Ferazuma et al (2011) have conducted research on the use of catfish head flour as a partial substitute for wheat flour in the manufacture of crackers. The aim of the research is to increase the calcium content in the crackers product. The results of his research showed that the substitution of 12.5% African catfish head flour in wheat flour resulted in crackers products that were still favored by the panelists. This cracker product , which was substituted with catfish head flour, was able to increase the calcium content by 350%.

cracker product is very suitable for consumption by teenagers and adults as well as mothers who are pregnant. According to Purnasari et al (2016), the need for calcium will increase when mothers are pregnant. Sulistiyatia and Mawaddaha (2021) informed that the Nutrition Adequacy Rate (RDA) for calcium consumption per day for adolescents is 1000 mg and adults 800 mg.

Making crackers in research conducted by Farazuma et al (2011) using the all in dough method, where all ingredients are mixed at once into a dough and fermented together. After fermentation, the dough is flattened, laminated, molded, and baked. The initial roasting temperature is 180°C and the final temperature is 150°C. The ingredients used include wheat flour, African catfish head flour, sugar, skim milk, margarine, butter, salt, baking powder, water, and yeast.

Utilization of Fish Head as Supplementation Material in Cilok Products .

Fish head meal supplementation was applied to cilok. Cilok products are snacks made from tapioca flour as the main ingredient. Cilok is liked by children, so it is widely marketed around the elementary school environment.

The advantage of fish head meal supplementation in cilok is to increase the protein and calcium content. Both nutritional components are indispensable for growth, especially in children.



Figure 2. Cilok (source: <https://kumparan.com/recipes-food/cara-make-cilok-yang-easi-complete-with-spice-nut-1wwuX1WkeWD/1>)

The results of research conducted by Apriyana (2014), showed that the addition of catfish head flour up to 10% of tapioca flour resulted in the most preferred cilok product by the panelists. The treatments for adding catfish head flour were 0%, 10%, 20% and 30%. The protein content of cilok from the 10% treatment was 7.62 % while the protein content of cilok control (which was not added with catfish head flour) was 6.88%. Based on these results indicate that the addition of fish head flour can increase the protein content of cilok by 10.75 % .

The procedure for making cilok with the addition of fish head flour is as follows: The first stage is preparing the spices, namely garlic, pepper and salt. Garlic is crushed until smooth then added pepper and salt. Next, fish head flour and tapioca flour are mixed with spices until homogeneous. Then the mixture is added hot water little by little while stirring until a dough forms. The last stage, the dough is formed into balls. The size of the circle as needed.

Utilization of Fish Head as an Material for Making Crackers

Crackers are dry food made from the main raw material which contains quite high starch and undergoes volume expansion to form a porous and low density product during the frying process (Koeswara, 2009). Crackers are very liked by the people of Indonesia both from among children and adults. The taste of crackers in Indonesia varies from the taste of onions, fish, cengkol and others.



Figure 3. Fish flavored crackers (source: <https://www.diadona.id/food/5-cara-buat-kerupuk-ikan-tenggiri-tongkol-lele-gabus-bandeng-yang-enak-gurih-dan-kriuk-2005043.html>).

Fish flavored crackers are also called fish crackers. The taste of fish is obtained because in its manufacture fish meat is added. The taste of fish can also be obtained from the addition of fish heads, because there is still some meat in the fish heads.

Making crackers using fish heads is carried out as follows (Bahrie, 2020). The fish head was washed and removed the gills and scales and fins. Next, the fish head is boiled in a pressure cooker to get a soft texture. The fish head that has been soft is then blended until soft. After that, other additional ingredients are mixed, namely tapioca flour, eggs, milk powder, garlic, sugar and salt. Next, the mixture is made into a dough. The formed dough is molded in an aluminum pan with a thickness of 0.3 – 0.5 cm. After that steamed for 8 minutes. The steamed dough is then taken from the pan and stored at room temperature for

12 hours . The next stage is the dough is cut into the desired shape. Then dried for 6 hours in the sun. The raw crackers obtained are then fried and ready to be consumed.

Utilization of Fish Heads as Flavor Products

According to Junianto and Diandry (2021), fish heads can be made into flavor powder to replace the synthetic flavor. Excessive use of synthetic flavor will spur cancer.

The procedure for making flavor powder from fish heads (Ramadhani, 2015) is as follows: Clean fish heads, gills, fins and scales removed. The clean fish head is cut into small pieces and put into a pot filled with water. Then into the pan put salt and spices that have been mashed. The spices used are garlic, onion and pepper. Furthermore, the mixture of fish heads, spices and water is boiled for 30 minutes at a temperature of 80-100 °C. The broth from the stew is filtered, the filtered liquid is given a thickening agent, namely wheat flour as much as 15% of the filtered liquid . Then stirred until homogeneous. The liquid mixture was then dried in the oven at 40 °C for 48 hours . The dried flavor was crushed using a blender to form a powder, then sifted to produce a powdered flavor.



Figure 5. Flavor powder from Mackerel Fish Head with Wheat Flour as a filler (Ramadhani, 2015)

The organoleptic properties of the flavor made from fish head are strongly influenced by the type of fish. The color of the tuna flavor powder is cream, identical to the color of the commercial flavor powder made from beef (Ramadhani, 2015). The flavor texture is strongly influenced by the spice formulation. According to Pardede, et al (2020) consumers prefer a finer powder texture that is more moist. The flavor texture of the pomfret head is preferred over the flavor texture of other types of fish head. The flavor and smell of the mackerel fish head is more preferable than that of other types of fish head. The strong broth taste combined with a slightly salty taste gives it its own sensation. Taste is

formed from the sensation that comes from the combination of the constituent ingredients and their composition in a food product that is captured by the sense of taste and is one of the supporters of taste that supports the quality of a product (Ramadhani, 2015).

Utilization of Fish Head as a Source of Gelatin for Food

According to Muflih (2014), the role of gelatin is very important in the food industry. Gelatin is widely used for making sausages, ice cream, chocolate and dairy products. The function of gelatin in the food industry is as a stabilizer, gelling agent, thickener and emulsifier. The very wide use of gelatin makes the demand for gelatin in Indonesia increase and Indonesia has to import gelatin because there are no gelatin-making companies in Indonesia (Mardiyah, 2017).

Gelatin can be extracted from the fish head because the fish head contains bones. Various studies have informed that the yield of gelatin extracted from fish heads is quite high. Arnesen and Gildberg (2006) reported that cod head is very potential to be used as raw material for making gelatin because it has a fairly high yield of 12%. Khiri et al (2011) also reported that the yield of gelatin from catfish and mackerel heads was 8.4 % and 3.7%, respectively.

The procedure for extracting gelatin from fish bones can be carried out as follows (Mardiyah, 2017): Clean the fish head and remove the gills. Then the fish heads were degreasing using hot water at 80 °C for 20 minutes. The fish head that has been degreasing is separated from the meat, so that all components of the fish head except the meat can be extracted. Furthermore, the fish heads were immersed in 2,98% HCl for 48 hours with a ratio of 1:3 (w/v). Then filtered using a filter cloth, and the residue (ossein) obtained was washed with distilled water until the pH was neutral. Next, the ossein was weighed and 1:3 (w/v) distilled water was added for the gelatin extraction process. Gelatin extraction was carried out in a water bath at a temperature of 74 °C for 5.42 hours. Then filtered, the filtrate obtained was dried in a cabinet dryer for 48 hours at a temperature of 40 °C. The obtained gelatin was then packaged and ready for use.

Conclusion

Based on the results of literacy, information is obtained that fish heads can be used as food products that have high added value. These products include 1) Indonesian food, fish head gule. 2) Fish head flour as a substitute for crackers products. 3) Fish head flour as a supplement for cilok. 4) Fish crackers. 5) Product flavor, food flavoring. 6) gelatin as

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