

A REVIEW - THE ADDITION OF FISH MEAT ON DONUT AND CASSAVA KECIMPRING CHIPS AS A PROTEIN SOURCE

Iis Rostini¹

¹ Staff at Laboratory of Fisheries Processing Product, Faculty of Fisheries and Marine Sciences, University of Padjadjaran, Indonesia

ABSTRACT

The addition of fish protein to food products can be used as an effort to increase public consumption of fish. Fish meat can be added to food products in the form of minced fish or surimi. Minced fish can be used as raw material for various fishery products, especially products that must have a distinctive fish aroma. The addition of surimi is carried out mainly on various products that have a low protein content, so that it can increase the protein content in food and can assist in fulfilling protein intake into the body. The minced fish and surimi can be dried into flour or powder, making it easier to apply. Minced fish can be added to cassava kecipring chips which has a low protein content, while surimi in powder form can be added to donuts. Donuts are one of the most popular foods for all ages, so it is hoped that it can help in the program to increase fish protein consumption.

Keywords: - Donut, Kecimpring chips, Minced fish, Protein, Surimi

1. INTRODUCTION

Fish is one of the foodstuffs that have a high nutritional content, especially protein. The chemical composition of fish in general is 70-85% water content, 15-25% protein, 1-10% fat and 1-1.5% minerals [1]. The level of fish consumption in Indonesia is still far behind other countries which have much smaller potential for fishery resources. The fish consumption rate in 2014 was 38.1 kg/capita/year. The level of consumption is relatively low compared to the potential of fishery resources owned [2]. The addition of fish protein to food products with low protein content can be used as an effort to increase public consumption of fish. Fish meat can be added to food products in the form of mashed meat or surimi. The mashed meat and surimi can be dried into flour or powder, making it easier to apply.

Minced fish is meat that has been separated from the bones, head, offal, and crushed using a meat grinder. Minced fish can be used as raw material for various fishery products, especially products that must have a distinctive fish aroma. Minced fish can also be added to food products to add a distinctive taste and aroma. Minced fish can be added to cassava kecipring chips [3], fish crackers [4], noodles [1] and can also be added to red guava dodol in the form of meat flour [5].

Surimi is a wet protein concentrate that is bright white in color, odorless and has no taste because it has undergone a washing process. This allows surimi to be used as raw material for various processed fishery products, especially various fish jelly products including meatballs, nuggets, fish burgers, dragon legs, otak-otak. Surimi can also be used as an additive for various food products, either in wet form or in flour or powder (dried surimi). The addition of surimi is carried out mainly on various products that have a low protein content, so that it can increase

the protein content in food and can assist in fulfilling protein intake into the body. Food products that can be added to surimi include bread, biscuits [6], donuts [7], and seaweed jelly candy [8].

Thus surimi can be added to various products, both products that taste salty and products that taste sweet. The purpose of this study was to analyze the use of fish meat as a source of protein which was applied to donuts and cassava kecipring chips.

2. MATERIAL AND METHOD

In this study used descriptive analysis based on a literature review using secondary data as a source of information. Secondary data obtained from books, scientific works, and research journals.

3. THE ADDITION OF SURIMI ON DONUT

3.1 Surimi

Surimi is a term that comes from Japanese which indicates the form of minced fish as the basic ingredient for processing traditional Japanese products "kamabako". Currently, surimi is known as minced fish that has undergone a washing process. One of the advantages of surimi is its ability to be processed into various kinds of advanced products [9].

Two main elements that must be considered to produce good quality surimi are raw materials derived from white fish meat and low fat content. Biological factors such as egg-laying phase, season and size can also affect the quality of the surimi produced [10].

Surimi as raw material for intermediate products according to [11] has special properties, namely:

- a. Able to form a gel when heated after added salt
- b. Able to bind materials and mix with other materials without changing the texture.
- c. Easy to shape as desired
- d. The process of heating surimi to form a gel can be done in various ways.

The most important criteria in determining the quality of surimi is the elasticity of the resulting product due to the formation of fish gel. Factors that affect the elasticity of surimi products include: type of fish, fish freshness, pH, water content, washing, temperature and cooking time and the amount of additives, such as salt, sugar, polyphosphate, monosodium glutamate, starch and egg white. Mining and milling treatments also determine texture [12].

Technically all types of fish can be made into surimi. Fish meat has the ability to form a perfect gel resulting in an elastic texture, good taste and white appearance. However, for fish with white flesh that does not smell of mud, is not too fishy and has good gel-forming ability, it will give good surimi texture results. Fresh water fish such as catfish, bonylip barb, silver barb can be processed into surimi. For freshwater fish species, prior to processing, they are cleaned so that the smell of mud in the final product can be reduced [13].

3.2 Preparation of Surimi

The steps in making surimi are weeding fresh fish by removing the head, skin and entrails. Then the filleting process is carried out to obtain the meat that will be used in making surimi.

The fillet meat was ground using a grinder to obtain minced fish and then weighed. Furthermore, the minced fish was washed using cold water at a temperature of 5 - 10 °C with a ratio of water to meat of 3: 1. During the washing process, the minced fish was stirred for \pm 10 minutes with a washing frequency of 2 times. In the last washing, 0.3% salt was added and then pressed or squeezed to remove some of the water so that surimi was obtained. Making surimi from tilapia meat is based on [14] with some modifications.

Surimi which is applied to the donuts is mixed in the form of dry powder. Surimi that has been formed, dried in an oven at a temperature of 40-50 °C. The grinding process is then carried out to smooth the rough product. Then sifted using a flour sieve, so that the surimi is obtained in powder form. Surimi is presented in Figure 1.



Fig -1: Appearance of (a) Minced fish, (b) Surimi, (c) Surimi powder Made from Fish Meat

3.3 Surimi Application on Donut

Fish is an animal food that has several advantages compared to other protein sources, including a fairly high protein content, which is around 18%. Fish meat also contains unsaturated fatty acids with very low cholesterol levels needed by humans. Fish protein can not only be obtained by consuming fish directly in its whole form, but can be added in various forms to processed products, including in the form of surimi. Surimi is fish meat that has been pulverized but gets additional treatment such as washing with cold water, ice and salt. Surimi is a colorless, odorless and tasteless product, making it possible to modify it into products with various desired properties, tastes, colors and aroma [15].

Surimi can be added to products that are commonly consumed and liked by the public, including donuts, to improve nutritional quality, especially protein content. Donuts (doughnuts or donuts) are fried snacks, made from a mixture of flour, sugar, eggs and butter. The most common donuts are ring donuts with a hole in the middle and round donuts with sweet fillings, such as various types of jam, jelly and cream. According to [6], the color and taste of sweet bread that the panelists liked the most was the addition of 2% fish protein concentrate. Based on this, the surimi added to the donuts is 2% of the weight of the flour. The ingredients for making donuts with the addition of surimi flour are presented in Table 1.

Table -1: The Ingredients for Making Donuts with the Addition of Surimi Powder

Name of Material	Total
High protein flour (g)	500
Surimi powder (g)	10
Garam (g)	0.6
Egg yolks	3
Powdered sugar (g)	75
Butter (g)	75
Instant yeast (g)	12.5
Powdered milk (g)	12.5
Warm water (ml)	250
Powdered sugar for sprinkling (g)	250

The tools used for the donut processing with the addition of surimi powder are plastic container, filter cloth, meat grinder, material scale, oven, stoves, pans, trays, plates, spoons and glasses.

The procedure for making donuts with the addition of surimi powder (Figure 2) are as follows:

1. Dissolve instant yeast in warm water and stir.
2. Put all the ingredients into a plastic container/basin, then stir for about 10 minutes until smooth (dough/dough doesn't stick to your hands).
3. Lift the dough, and mold it into a circle like a ring. Store in a tray that has been lined with plastic and dusted with flour first.
4. Let stand about 15 minutes or until fluffy.
5. Fry on medium heat

6. After a little cool, sprinkle the donuts with powdered sugar and serve.



Fig -2: The appearance of donuts added with surimi powder

4. THE ADDITION OF FISH MEAT ON CASSAVA KECIMPRING CHIPS

4.1 Cassava Kecimpring Chips

Cassava kecimpring chips is a processed product made from cassava. This product is used as a "snack" food by most people in West Java, especially in rural areas. Cassava kecimpring chips are mostly processed and produced by rural communities and then traded in traditional markets. Generally, cassava kecimpring chips products are traded in raw form without being packaged, although some have been fried.

Cassava kecimpring chips product as a local food has the potential to be developed into a national product, even if it is an international scale product. The potential for cassava raw materials in rural areas is easily obtained so that the continuity of cassava kecimpring chips production can be maintained.

The strategy for developing cassava kecimpring chips from local food to national food is through improving quality and image. Quality improvement can be done both physically and chemically. Physically through modification of the shape of cassava kecimpring chips. Chemically through fish meat supplementation so that the protein content of cassava kecimpring chips becomes higher. The strategy through image enhancement can be done by packaging treatment of kecimpring chips products either in raw form or already fried so that they are ready to eat. Based on the raw materials used, cassava kecimpring chips have an unbalanced nutritional content, which is rich in carbohydrates but poor in protein. According to [16], the direct cause of malnutrition is unbalanced food both in quantity and quality of nutritional intake. The main nutritional problem in Indonesia is still dominated by malnutrition or Protein Energy Lack. With regard to the imbalance in nutritional quality of cassava kecimpring chips mentioned above, which is poor in protein, the effort that can be done is to do supplementation with fish meat. According to [17], the quality of fish meat protein is very good because it contains essential amino acids that are needed by the body and have a high biological value so they are easy to digest.

The protein content of kecimpring without the addition of fish meat is 2.53% [18]. Furthermore, the protein content of kecimpring with the addition of 30% tilapia (*Oreochromis niloticus*) meat was 11.54% [3]. The addition of fish meat to cassava kecimpring treatment with the addition of 10% catfish meat resulted in the most preferred kecimpring, with the highest alternative value of 7.20; water content 11.45%; 5.81% protein; 1.20% fat and 4.82% ash [19]. The increase in protein content in kecimpring chips is due to the fish used having a fairly high protein content, although the value is different for each type of fish.

4.2 Stage of Making Cassava Kecimpring Chips with The Addition of Fish Meat

4.2.1 Preparation of Minced Fish

The fish were washed with running water then weeded and washed again until clean. Next, the fish is filleted, the fish meat is separated from the skin, washed with cold water and then ground using a meat grinder to produce soft and clean minced fish. The minced fish can be used directly as raw material for the manufacture of fishery products, can be used as raw material for making surimi or can be used as stock to be processed into various processed products.

4.2.2 The Application of Fish Meat on Cassava Kecimpring

Cassava was peeled and washed. It was then grated and mixed with the seasoning, followed by the addition of fish meat. The dough was put on the leaves and was then steamed for 5 min, then dried under the sun.

Afterwards the dried kecimpring chips were fried and packaged [3]. The spices used in making cassava kecimpring chips are 2% salt, 2% white sugar, 2% garlic, and 2% onion [18].

The ingredients used to make cassava kecimpring chips with the addition of fish meat are 100 grams of grated cassava, 10 grams of fish meat, 2 grams of salt, 2 grams of coriander, 2 grams of garlic and 2 grams of onion. The tools for cassava kecimpring chips with the addition of fish meat processing are pot, meat grinder, material scale, molds, baking pans, forks, grate, stove, pan, trays, plates, spoons, glasses, mash, and basin.

The procedure for making cassava kecimpring chips with the addition of fish meat (Figure 3) are as follows:

1. Fish are weeded and then washed clean. Furthermore, the fish meat is chopped or crushed until smooth.
2. Cassava peeled and then washed.
3. Cassava tubers that have been peeled and washed and then grated.
4. Grated cassava and minced fish are mixed
5. The mixture is homogenized and then printed on a baking sheet and after that it is steamed.
6. After steaming then drying in the sun to dry.
7. The dried cassava kecimpring chips is then fried.

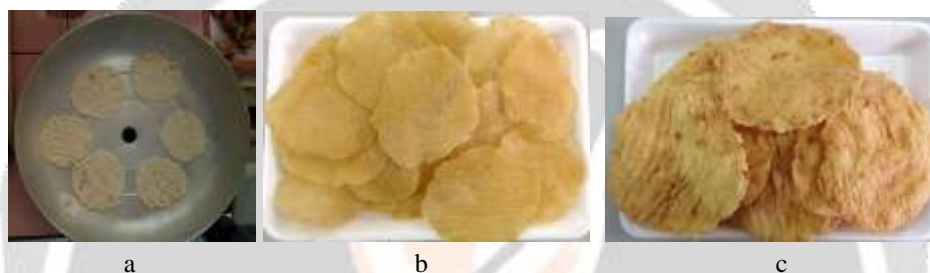


Fig -3: The appearance of (a) cassava kecimpring dough, (b) Dried raw cassava kecimpring chips, (c) Fried cassava kecimpring chips

5. CONCLUSIONS

Fish meat can be added to food products as a source of protein. In its application, it can be added in the form of minced fish, wet protein concentrate surimi and surimi in powder or flour form. Surimi can be added to donut formulations without interfering with its characteristics because surimi has a neutral taste and aroma. Meanwhile, minced fish added to kecimpring can give a savory taste and a distinctive fish aroma.

6. REFERENCES

- [1]. Rubiyanto, S. (2008). "Pembuatan Mie Instan dengan Penambahan Daging Ikan Nila (*Oreochromis niloticus*) serta Uji Karakteristik Mie yang Dihasilkan". Skripsi. Fakultas Perikanan dan Ilmu Kelautan. Institut Pertanian Bogor. Bogor.
- [2]. Djunaidah, IS. (2017). "Tingkat Konsumsi Ikan di Indonesia: Ironi di Negeri Bahari". [Level of Fish Consumption in Indonesia: Irony in The Nautical Country]. Jurnal Penyuluhan Perikanan dan Kelautan, Vol. 11, No. 1, pp. 12-24.
- [3]. Rostini I, Kurniawati N, Junianto. 2016. Chemical characteristics of kecimpring chips with addition of fish meat from Cirata Reservoir. *Jurnal Teknologi (Sciences & Engineering)*, 78 (4-2):77-84.
- [4]. Aswari, EJ., Rostini, I., Iskandar., Afrianto, E. (2019). "Utilization of Hampal (*Hampala macrolepidota* Kuhl & van Hasselt, 1823) meat on Fish Crackers Preference Level". World Scientific News, Issue 130, pp. 163-180.
- [5]. Sriwidianingsih, IY., Kurniawati, N., Rostini, I. (2013). "Penambahan Tepung Daging Nila terhadap Tingkat Kesukaan Dodol Jambu Merah". Jurnal Perikanan dan Kelautan, Vol. 4, No. 3, pp. 137-144.
- [6]. Djafar, MJ. (2003). "Aplikasi Penggunaan Konsentrat Protein Ikan dalam Pembuatan Produk Pangan Berprotein Tinggi". [Application of Fish Protein Concentrate in the Manufacturing of High Protein Food Products]. Laporan Akhir Program Insentif Peningkatan Kapasitas Iptek Sistem Produksi. Badan Pengkajian dan Penerapan Teknologi. Jakarta.

- [7]. Wijaya, FP. (2015). "Fortifikasi Protein Surimi Manyung terhadap Tingkat Kesukaan Donat". [Arius thalassinus Surimi Protein Fortification on Donut Preference Level]. Skripsi. Fakultas Perikanan dan Ilmu Kelautan. Universitas Padjadjaran Jatinangor.
- [8]. Amanah, R., Junianto., Rostini, I. (2015). "Penambahan Surimi Lele terhadap Tingkat Kesukaan Permen Jelly Rumpun Laut". *Jurnal Perikanan Kelautan* Vol. 6, No. 2, pp. 43-50.
- [9]. Okada, M. (1992). "History of Surimi Technology in Japan". Dalam Lanier TC, Lee CM (eds). *Surimi Technology*. Marcel Dekker Inc. New York.
- [10]. Mitchell, C. (1985). "Surimi: the American experience". *Infofish*, Vol. 5, pp. 17-20.
- [11]. Irianto, B. (1990). "Teknologi Surimi Salah Satu Cara Mempelajari Nilai Tambah Ikan-ikan yang Kurang Dimanfaatkan". *Jurnal Penelitian dan Pengembangan Pertanian*, Vol. 9, No. 2, pp. 35-39.
- [12]. Heruwati ES, Murtini JT, Rahayu S dan Suherman. 1995. "Pengaruh jenis ikan dan zat penambah terhadap elastisitas surimi ikan air tawar". *Jurnal Penelitian Perikanan Indonesia*. Vol. 1, No. 1, pp. 86-94.
- [13]. Peranganing, R., Wibowo, S., Nuri, Y., Fawza. (1999). "Teknologi Pengolahan Surimi". Balai Penelitian Perikanan Laut Slipi. Jakarta.
- [14]. Suzuki, T. (1981). "Fish and Krill Protein, Processing Technology". Applied Science Publ. Ltd. London.
- [15]. Haryati, S. (2001). "Pengaruh Lama Penyimpanan Beku Surimi Ikan Jangilus (*Istiophorus* sp.) terhadap Kemampuan Pembentukan Gel pada Produk Gel Ikan". Skripsi. Institut Pertanian Bogor. Bogor.
- [16]. Agrina. (2010). "Tingkat Pengetahuan Ibu yang Memiliki Balita dengan Kurang Energi Protein Tentang Gizi Balita di Kota Pekanbaru". *Jurnal Keperawatan Profesional Indonesia* Vol. 2, No.1, pp. 18-24.
- [17]. Junianto. (2003). "Teknik Penanganan Ikan". PT. Penebar Swadaya, Jakarta.
- [18]. Kurniawati, N., Junianto., Rostini, I. (2015). "Pemanfaatan Daging Ikan dari Waduk Cirata sebagai suplementasi pada Kecimpring Singkong dan Daya Simpannya dalam Berbagai Kondisi Kemasan". Laporan Tahunan Penelitian Unggulan Perguruan Tinggi. Universitas Padjadjaran. Jatinangor.
- [19]. Kurniawati N, Junianto, Rostini I. (2017). "Penambahan Daging Ikan Asal Waduk Cirata terhadap Tingkat Kesukaan Kecimpring Singkong". *Jurnal Akuatika Indonesia*, 2 (1): 64-70.