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SURIMI FISH ELASTICITY

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Abstract

Surimi is a food ingredient made from fish meat that is mashed and mashed to form a paste. Good surimi has a grade A level of elasticity because surimi is a gel that will be made into various fish jelly products. This is closely related to what type of fish is used as a base for making surimi. All types of fish can be used as raw material for making surimi, as long as they have the ability to form gels. However, fish that produce the best surimi elasticity are fish that contain high protein, especially myofibrils protein which can form a gel. For this reason, it is very important to examine the elasticity of the surimi from various types of fish to determine the type of fish that is most appropriate to be used as a base for making surimi.

Keywords: Surimi, Elasticity, Fish Types.

Introduction

Fishery products tend to increase every year, but this increase has not been followed by advances in the use of optimal processing technology. On the other hand, people prefer to consume food that is fast in serving but with optimal nutritional content. Therefore, humans create various processed food products, namely product diversification. One of the product diversification that is often done in fish processing is surimi (Sarie et al. 2018).

Surimi products are a form of fishery product diversification whose technology can be applied to various types of fish, especially white fish (Sarie et al. 2018). Surimi has a promising prospect to continue to be developed because it has increased over time each

year (Kim et al., 1996). Surimi has added value because it can be processed into various kinds of advanced products such as fish balls, kamaboko, sausage, chikuwa, and tempura (Zhou et al., 2005). Surimi raw materials are usually from fish species with white flesh and fish that have low economic value (Sarie et al. 2018).

The nutritional content of each type of fish is different, this is determined by internal and external factors. The internal factors referred to are the type or species of fish, the reproductive phase, age, and the sex of the fish. While external factors are factors found in the living environment of fish such as water quality, habitat, and availability of food (Sarie et al. 2018). The habitat in which the fish live will determine the chemical content contained in the meat, including fatty acids, proximate, and amino acids (Aziz et al, 2013).

Many types of fish that can be found in the market are commonly consumed by the community, from marine fish to freshwater fish that are obtained from cultivation and catch. These fish are usually consumed fresh and in processed form such as salted fish, crackers and amplang. In order for the fish to have added value, it is necessary to diversify the processing such as surimi as a raw material for further processing so as to shorten the processing time. Each surimi produced has different characteristics depending on the process and processing material. Fish species are proven to have an influence on the elasticity level of surimi diversification products. The purpose of this review article is to examine the elasticity of surimi from various fish species. This is very necessary to determine the type of fish that is most appropriate to use in making surimi. The elasticity of surimi is very important, because it will determine the value and quality of the processed products that are made next.

Surimi Elasticity Of Different Fish Species

The use of different types of fish has been shown to have a significant effect on the elasticity of surimi. Based on research results Sarie et al (2018) In the surimi fold test parameter (Table 1) shows that the highest value is obtained from the use of milkfish with a value of A as raw material, while the lowest value is Belida fish with a value of D.

Table 1. Surimi Fold Test

No.	Test Fish	Fold Test Value
1.	Milkfish	A
2.	Belida fish	D

The better the value of the fold test shown is always directly proportional to the increase in the quality of the surimi gel produced. The better the value of the fold test, the better the quality of the surimi gel produced. Berlyanto (2004) states that the fold test with a value of 3 (B) indicates that the level of surimi elasticity is quite good and a value of 4 (A) is for a good elasticity value. Meanwhile, the value 1 (D) is the lowest value, which indicates the level of elasticity is not good.

Table 2. Gel strength and water content

No.	Test Fish	Gel Strength (kg.mm)	Water content (%)
1.	Tambakan Fish	50-118	82.54-87.21
2.	Tawes Fish	13-45	80.26-82.50
3.	Nilem Fish	11-46	80.16-82.83

Meanwhile, the results in the research by Heruwati et al (1995) in Table 2 show that the Tambakan fish surimi has a much higher elasticity than the tawes and nilem fish surimi. This is very likely due to the protein content of the pond fish which is indeed higher than the protein content of the other two types of fish. (Heruwati et al. 1995). This elasticity is measured based on the strength of the gel and the moisture content it produces.

Picture 1 Milkfish and Belida Fish (Source: gardaanimalia.com)

Picture 2 Tambakan fish (1), Nilem (2), and Tawes (3)
(Source: jdih.kkp.go.id; Jejamo.com;
Komunitaspenyuluhperikanan.blogspot.com

Moniharapon (2014) suggest that basically surimi can be made from various types of fish, as long as the fish has the ability to form a gel, this affects the elasticity of the advanced surimi products. Gel formation of myofibril proteins is a fundamental property of product development which makes elasticity its main property. Fish gel formation occurs when raw meat is added with salt (Santoso, 2009). Actomyosin (myosin and actin) as the most important component in the formation of gel will dissolve in a salt solution, which then forms a sol (dispersion of solid particles in a liquid medium) which is very sticky. When the sole is heated, it forms a gel with a mesh-like construction and gives the fish its elastic properties. This elastic property is called ashi or suwari. The strength of ashi is a quality value of fish gel products (Santoso et al., 2008). Its ability to form a gel (elasticity), taste and good appearance.

In making surimi, the quality of the raw materials has a strong influence on the quality of surimi, so it is very important to choose good quality raw materials. The reason fish is very appropriate to use as a material for making surimi is because fish contains complete nutritional components. Fish is a great source of protein, minerals and vitamins. In making surimi, the protein content in fish raw materials is a very important main component. In 100 grams of fish meat contains 15-25% protein. Protein in fish meat consists of 3 classifications, namely myofibril protein (65-75%), sarcoplasm (20-30%) and stromal protein (1-3%). For the part of the sarcoplasmic protein in surimi production, it will be removed at the washing process on the grounds that it has no role in gel formation

and will only inhibit myosin cross-linking in the gel formation process (Haard et al., 1994). Meanwhile, myofibril protein is a protein that can form a gel. Myofibril protein consists of protein myosin, actin and actomyosin (Shahidi, 1994).

Fish that are commonly used in making surimi are generally fish that contain high protein and low fat. Dark meat fish meat is usually caused by the amount of fat and high myoglobin which can affect the formation of surimi with good quality. Based on the fat content, fish can be grouped into three groups, namely lean (fat content less than 4%), medium fat (fat content between 4-8%), fatty (fat content above 8%) (Pratiwi, 2015).

Conclusion

Fish as a raw material for making surimi has been shown to have an influence on the elasticity of surimi. All types of fish can be used as raw material for making surimi, as long as they have the ability to form gels. However, fish that produce the best surimi elasticity are fish that contain high protein, especially myofibrils protein which can form a gel. So that the fish that is most appropriate to use as raw material for making frozen surimi is fresh demersal fish which is white, does not smell of mud, and has good gel-forming abilities. Meanwhile, dark-fleshed fish indicates that the fish contains high fat, so that the elasticity of the surimi it produces is less than optimal.

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