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Quality and Food Safety of Shrimp Paste Produced In District of Takalar, Province of South Sulawesi

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Abstract : This study aims to know quality and food safety of shrimp paste produced in District of Takalar, Province of South Sulawesi. Research was conducted used survey and evaluation methods. Sample of shrimp paste were taken in District of Takalar used *Purposive Sampling* methods. Samples were analyzed at Laboratory of BIOCHEM, Chemistry Department, University of Brawijaya and Laboratory of Application of Quality of Fishery Product, Marine and Fisheries Department Province of South Sulawesi refers to SNI 2716: 2016. The results showed that the shrimp paste produced in District of Takalar, Province of South Sulawesi fulfilled the quality and food safety requirements of shrimp paste based on SNI 2716: 2016 for sensory parameters (mean = 7.8), salt content (15%), E. coli (<3 MPN / g), but for protein content less than quality requirement and food safety of shrimp paste (12.54%) and water content more than quality requirement and food safety of shrimp paste(47.85%).
Keywords : shrimp paste, quality, food safety, Takalar, South Sulawesi.

Introduction

South Sulawesi is a province that has considerable fishery potential. In 2014, fisheries production in South Sulawesi reached 5,115,855,621 tons. From this production, almost 50% is preserved / processed traditionally. Salting/drying still dominates the preservation/processing activities in South Sulawesi with a total of 1,213 units, then curing/roasting 175 units, scanning 162 units and fermentation 68 units[(1)]. The fermentation product commonly found in South Sulawesi is shrimp paste.

Afrianto and Liviawaty *in* Suwandi, *et al.*[(2)] explained that shrimp paste is one of fermented fish (or shrimp) products that only undergoes salting treatment (without being followed by addition of acid), then left for a while to make the fermentation process occur. Karim, et al. [(3)] added that shrimp paste is one of the fishery products which is made by fermentation. Shrimp paste is generally made from the main ingredients of small shrimp which is often called *rebon* small shrimp.

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One district in South Sulawesi that produces shrimp paste is Takalar Regency. Takalar Regency is located between $5^0$3 'to $5^0$38' South Latitude and $119^0$22 'to $119^0$39' East Longitude. In the East it is administratively bordered by Gowa and Jeneponto Regency, on the north by Gowa Regency and on the west and south by the Makassar Strait and Flores Sea. The total area of Takalar Regency is 566.51 km^2 consisting of 9 sub-districts and 100 village / kelurahan areas [(4)].

Lagaruda village is a shrimp paste producing area in Takalar Regency, South Sulawesi. As an area located on the coast, most of the people work as fishermen. One of the catches of fishermen is *rebon* small shrimp. Shrimp paste from *rebon* small shrimp is a food that is included in the flavor-forming category and is a typical food that is very familiar to the people of Indonesia. Shrimp paste is traditionally processed using very simple technology. The main ingredient of shrimp paste processed in Takalar Regency is rebon small shrimp [(5)].

Traditional shrimp paste processing is generally not sufficient to meet good quality standards, in terms of nutrition, sensory value and durability. This is due to low knowledge in how to handle, quality control and sanitation (Supardi, 1999) *in*[(6)].

This research was conducted to determine the quality and food safety of shrimp paste produced in Takalar Regency.

Methods

This research was conducted in May - June 2018. The sample was taken using *Purposive Sampling Method* in Takalar District. The parameters of quality and food safety were analyzed in the BIOCHEM (Healthy Food) Laboratory of the Department of Chemistry at the University of Brawijaya and the Laboratory for Implementing the Quality of Fisheries Products in South Sulawesi. The quality and food safety parameters analyzed were sensory, water content, salt content, protein content and *Escherichia coli* contamination. The results obtained refer to SNI 2716: 2016 concerning requirements for quality and food safety of shrimp shrimp paste food [(7)].

Sensory testing useshrimp paste sensory testing sheets SNI 2346: 2015, water content (SNI 2354.2: 2015), salt content (SNI 01-2359-1991), protein content (SNI 01-2354.4: 2006) and *Escherichia coli* (SNI 2332.1: 2015).

Results and Discussion

a. Production of Shrimp Paste in Takalar Regency

Production of Shrimp Paste in Takalar Regency is carried out in several hamlets in Lagaruda Village. The process of making sharim paste in the regency is still done traditionally, with each stage being carried out manually. Includes drying of *rebon* small shrimp, grinding and forming.

Figure 1.Drying of *Rebon* Small Shrimp

Rebon small shrimp caught by fishermen, sorted and separated from small fish, then washed, salted and dried (Figure 1). The existence of small fish in *rebon* small shrimp, can damage the quality of shrimp paste, especially on taste of shrimp paste.

In the process of making shrimp paste, *rebon* small shrimp dried are crushed. *Rebon* small shrimp dried that are not directly produced become shrimp paste, stored in sacks and used as raw material stock. In the pulverization process, water is added to facilitate the formation of the shrimp paste. After being smooth, the shrimp paste is shaped like a hammered form of the hand (Figure 2), but some are formed with a flattened sphere resembling a *lopis* cake. Shrimp paste which is formed as absurdly hand then packed in plastic or sacks. But what is shaped like a flattened sphere, dried and then packed.

Figure2.Shrimp Paste OfTakalar Regency

b. Sensory Quality

Based on SNI 2716: 2016 [(7)], the qualityrequirements of shrimp paste is at least 7, for each parameter, namely appearance, odour, taste, and texture. The results of sensory quality test of shrimp paste produced in Takalar District is about 8. This value shows that the sensory value of shrimp paste produced in the district is above the value required by SNI 2716: 2016. The average value of each parameter, appearance 7, odour 7, taste 9, and texture 9. The value of 7 in the appearance parameter shows the specifications of the clean shrimp paste, the specific type of shrimp paste. A value of 7 in the odour parameter, shows a less specific specification of shrimp paste. A value of 9 in the taste parameter shows a very specific specification of shrimp paste. And a value of 9 in the texture shows that the shrimp paste is solid and compact.

A value of 7 in the odor and taste parameters is made possible by an incomplete fermentation process. Anggo, *et al.*[(8)] namely the process of fermentation in the processing of shrimp paste will cause the formation of peptides which make up the taste and smell of money. The longer the fermentation time, the substances will further increase the sensory value of shrimp paste.

Sanjaya, *et al.*[(9)] added that in the making of shrimp paste, the fermentation process is carried out after the dried shrimp or *rebon* small shrimp, mashed by storing them in a closed state. This fermentation process is continued for 30 days after grinding for the second time. The length of time needed in fermented shrimp paste greatly affects the taste and odour of the shrimp paste produced.

c. Water content

Water is a very important component for food because water can affect the appearance and texture of food. Water content is one of the factors causing damage to food, because water is a supporting medium for spoilage microbial activity [(10)].

The results of water content testing, showed that the average water content level of shrimp paste produced in Takalar District was ± 47.85%. This value is above what is required by SNI 2716: 2016, namely the maximum water content for solid dry shrimp paste is a maximum of 35%. The high water content in this shrimp paste, because in the process of grinding/refining *ebi* water is added, and shrimp paste which is sampled

are directly packed after being shaped like a fist without drying, not dried shrimp paste after forming like flat spheres.

The results of [10]research,showed the value of the water content of 33.36-34.69%, [9] 43.19-49.03%. water content in shrimp paste, influenced by the drying process and also fermentation. [11]writes that fermentation with salt produces water content which tends to decrease.

d. Salt content

Shrimp paste can experience a browning reaction that causes color decolorization so that the color of shrimp paste turns dark. The process is influenced by the presence of PPO (*Polyphenol Oxidase*) in shrimp. Salt serves as a growth inhibitor so that the browning reaction can be prevented [12].

The results of salt content testing showed that the average salt content levels of shrimp paste produced in Takalar District were ± 15%. This value is still in accordance with the requirements of SNI 2716: 2016, namely the salt content for shrimp paste is 12-20%. The results of[9]research,which added rosella extract to the production of shrimp paste, producing shrimp paste with salt content ranging from 5.63 to 7.16%, [12] 0.67 - 1.56%, [3] ± 0.64%.

The use/addition of salt in the production of shrimp paste is intended as a preservative because salt can inhibit the growth of undesirable microorganisms and accelerate the growth of bacteria that are expected (desired microorganism). In addition, salt also functions as a flavor for the product. [13]added that high salt levels would also absorb large amounts of water in food ingredients.

e. Protein content

According to Nooryanti, *et al.* (2010) *in*[8], during the fermentation process, the protein is hydrolyzed to its derivatives namely proteolysis, peptone, peptidee, and amino acids. Peralta,*et al.* (2009) *in*[8] also added that fermentation is the decomposition of proteins into simpler compounds (amino acids) under controlled conditions through a biological or semi-biological decomposition process.

The results of protein content testing showed that the average protein content of shrimp paste produced in Takalar District was ± 12.54%. This value is less than what is required by SNI 2716: 2016, namely the maximum protein content for shrimp paste is 15%.The results of [8]research,showed the value of protein content of *rebon* small shrimp paste up to ± 62.45%, [3] protein content of 35.10%, [9] 10.8 - 13.11%.

f. Escherichia coli

E. coli is a water quality indicator because its presence in the water indicates that the water is contaminated. In this study, *E. coli* was analyzed in relation to the water used and sanitation and hygiene in the shrimp paste production process. *E. coli* is not a halophilic bacterium, so with high salt levels, *E. coli* growth cannot be inhibited.

The results of testing the presence of *E. coli* in shrimp paste produced in Takalar Regency obtained an average of <3 APM / g. This value is as required by SNI 2716: 2016, that the microbial contamination requirements of *Escherichia coli*<3 APM / g. The results of [14] research, showed that there was *E. coli* contamination in 12 samples of shrimp paste marketed in Surabaya City 3.60 - 4.56 Log CFU/gr. This value is above the SNI requirements. While the research results of [6] showed that *rebon* small shrimp paste was of good quality because there were no *E. coli* contaminants and Coliform values still met the applicable SNI standards which stated that the maximum levels of Coliform and *E. coli* microbial contamination were <3 APM / gram.

Conclusion

The shrimp paste produced in District of Takalar, Province of South Sulawesi fulfilled the quality and food safety requirements of shrimp paste based on SNI 2716: 2016 for sensory parameters (mean = 7.8), salt content (15%), E. coli (<3 MPN / g), but for protein content less than quality requirement and food safety of shrimp paste (12.54%) and water content more than quality requirement and food safety of shrimp paste(47.85%).

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