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ANALYSIS OF CHEMICAL AND SENSORY QUALITY OF SHRIMP PASTE FROM KAUKAU VILLAGE, SELAYAR ISLANDS

Analisis Mutu Kimia Dan Sensoris Terasi Udang Di Desa Kaukau, Kepulauan Selayar.

Umniyah Musdhalifah Yusran[1*], Dian Purnamasari Anwar[2], Citra Amelya Rosenari[3]

1. Fishery Product Technology Study Program, Nobel Indonesian Institute of Technology and Business
2. Fishery Resource Utilization Study Program, West Sulawesi University
3. Independent Researcher, Indonesia

Sultan Alauddin Street No. 212, Mangasa, Makassar District, Makassar City, South Sulawesi 90221.

*Corresponding Author: ifah@nobel.ac.id

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ABSTRACT

The shrimp paste produced in Kaukau Village is widely marketed, indicating a high level of consumer acceptance. However, scientific information regarding the chemical and sensory quality profile of shrimp paste produced in Kaukau Village remains limited. This study aimed to analyze the chemical and sensory quality of shrimp paste processed using two different processing methods, namely a grinder and a traditional pounding tool. Purposive sampling was applied to collect shrimp paste samples from local producers. Sensory evaluation was conducted by 30 panelists assessing appearance, color, odor, taste, and texture. Chemical analyses included determination of moisture content, protein content, acid-insoluble ash, and salt content. The data were analyzed descriptively and presented in tables and figures. The sensory evaluation results indicated that shrimp paste produced using both processing methods exhibited good sensory quality, with appearance scores of 7.4–8.8, odor scores of 6.8–7.2, taste scores of 6.8–7.2, and texture scores of 6.8. The chemical composition of shrimp paste from both processing methods showed moisture contents of 24.53–25.05%, protein contents of 63.36–63.38%, acid-insoluble ash contents of 0.58–1.35%, and salt contents of 0.58–0.75%. In conclusion, shrimp paste processed using a grinder and a traditional pounding tool exhibited relatively similar chemical and sensory qualities, except for acid-insoluble ash content, which tended to be higher in shrimp paste processed using the traditional pounding method.

Keywords: Processing, Shrimp Paste, Quality, Shrimp, Kaukau Village

ABSTRAK

Terasi udang yang dihasilkan di Desa Kaukau dipasarkan secara luas, menunjukkan tingginya

tingkat penerimaan konsumen terhadap produk tersebut. Namun demikian, informasi ilmiah mengenai profil mutu kimia dan sensoris terasi udang yang diproduksi di Desa Kaukau masih terbatas. Penelitian ini bertujuan untuk menganalisis mutu kimia dan sensoris terasi udang yang diolah menggunakan dua metode pengolahan, yaitu alat penggiling dan alat tumbuk tradisional. Penelitian ini menggunakan metode purposive sampling dalam pengambilan sampel terasi dari pelaku usaha. Uji sensoris dilakukan oleh 30 panelis terhadap parameter kenampakan, warna, bau, rasa, dan tekstur. Analisis kimia meliputi pengujian kadar air, protein, abu tidak larut asam, dan kadar garam. Data dianalisis secara deskriptif dan disajikan dalam bentuk tabel dan gambar. Hasil uji sensoris menunjukkan bahwa terasi udang yang diolah menggunakan alat penggiling dan alat tumbuk tradisional memiliki mutu sensoris yang baik dengan nilai kenampakan 7,4–8,8; bau 6,8–7,2; rasa 6,8–7,2; dan tekstur 6,8. Komposisi kimia terasi udang dari kedua metode pengolahan menunjukkan kadar air sebesar 24,53–25,05%, kadar protein 63,36–63,38%, abu tidak larut asam 0,58–1,35%, serta kadar garam 0,58–0,75%. Kesimpulan penelitian menunjukkan bahwa terasi udang yang diolah menggunakan alat penggiling dan alat tumbuk tradisional memiliki mutu kimia dan sensoris yang relatif sama, kecuali pada parameter abu tidak larut asam yang cenderung lebih tinggi pada terasi yang diolah menggunakan alat tumbuk tradisional.

Kata Kunci : Pengolahan, Terasi, Mutu, Udang, Desa Kaukau

INTRODUCTION

Shrimp paste is a traditional food product made from fermented small shrimp with added salt and widely used as a flavoring in various Indonesian dishes. This product has important cultural and economic value, especially for coastal communities, because the production process is relatively simple and utilizes local fishery resources. The quality of shrimp paste is greatly influenced by the quality of the raw materials, salt concentration, fermentation time, and sanitation during processing and storage. Differences in these factors can cause variations in product quality, both in physical, chemical, microbiological, and sensory aspects, potentially affecting safety and consumer acceptance (Kurnianto *et al*., 2025).

Kaukau Village, located on Passi' Island, Bontoharu District, Selayar Islands Regency, is a coastal area with abundant shrimp resources. The village community has traditionally produced shrimp paste as a household business and source of additional income. The shrimp paste from Kaukau Village is marketed not only within Selayar Islands Regency but also to meet demand from buyers from other areas in South Sulawesi Province. The shrimp paste production process in Kaukau Village is generally carried out traditionally, using simple technology and based on the community's empirical experience. This situation can lead to inconsistencies in product quality, both between producers and across production periods. Therefore, scientific studies are needed to determine the quality characteristics of the resulting shrimp paste.

Analyzing the quality of shrimp paste is crucial because it directly relates to food safety and product competitiveness in the market. Shrimp paste products that do not meet quality requirements may contain pathogenic microorganisms or contain chemical compounds exceeding safe limits, potentially endangering consumer health. Recent research has shown that enhancing the fermentation process by inoculating certain bacteria can significantly impact the physicochemical and sensory properties of shrimp paste, thus helping to produce a product with more stable and safer quality (Surya, 2024). Furthermore, other research has shown that the addition of natural ingredients such as betel leaf oil can reduce the formation of harmful compounds and improve the safety profile of shrimp paste without compromising consumer preference (Pratama, 2023).

The results of chemical and sensory quality analysis of shrimp paste play a crucial role as a basis for improving product quality through improved processing, better sanitation practices, and more standardized fermentation control. Chemical quality analysis provides information on the nutritional content and chemical characteristics of shrimp paste, such as water content, protein, and other components that influence product stability and safety. Meanwhile, sensory analysis plays a role in assessing consumer acceptance of shrimp paste quality attributes, including color, aroma, taste, and texture, which are key factors in determining market preference.

Information on the chemical and sensory qualities of shrimp paste is expected to provide a scientific basis for increasing product added value, expanding marketing opportunities, and supporting the development of shrimp paste as a superior local food product in the Selayar Islands Regency. Based on this, research on the chemical and sensory quality analysis of shrimp paste in Kaukau Village, Selayar Islands, is necessary to obtain a comprehensive picture of product quality and as an initial step in supporting the development of a sustainable fishery-based home industry.

RESEARCH METHODS

Time and Place of Research

This research was conducted in Kaukau Village, Bontoharu District, Selayar Islands Regency. Shrimp paste quality analysis was conducted at the Animal Feed Chemical Technology Laboratory, Faculty of Animal Husbandry, Hasanuddin University. Sensory testing was conducted in Benteng Town, Selayar Islands Regency.

Tools and Materials

The tools and materials used are writing instruments, cameras, scales, basins, grinding machines, pestles, used bottles, ovens, petri dishes, desiccators, porcelain dishes, Kjeldahl flasks, Erlenmeyer flasks, shrimp paste, rebon shrimp, salt, water and chemical reagents.

Research Procedures

The data collection method used in this study was sampling and analysis. Shrimp paste samples were taken based on observation results, and then the shrimp paste was tested for chemical quality in the laboratory and sensory in the field to obtain data on the quality of shrimp paste produced from two different processing methods. The sample determination in this study used a purposive sampling method, a sampling technique by determining specific characteristics that are in accordance with the research objectives. Shrimp paste samples were taken in Kaukau Village, Bontoharu District. There were 5 shrimp paste processors still actively operating at the time of the study. Sampling was represented by 2 shrimp paste processors with the criteria selected processors having the highest daily production and income levels. Each shrimp paste processor used a traditional grinder and pestle. A total of 3 sample bottles were taken from both shrimp paste processors, samples were selected based on their freshness level, namely those that had just been processed to ensure the quality of the shrimp paste. Two bottles of shrimp paste from each processor were used as sensory test samples. Next, each bottle of shrimp paste for processing using a grinder and using a pestle was taken to the Animal Feed Chemical Technology Laboratory, Faculty of Animal Husbandry, Hasanuddin University for chemical testing.

Data analysis

The research data were analyzed descriptively according to the conditions encountered in

the field and then presented in the form of tables and figures.

RESULTS

Sensory Testing

In this study, sensory testing of shrimp paste was conducted in accordance with SNI 2346:2015. The testing was conducted by 30 panelists, with elements of testing including appearance, odor, taste, and texture. This test used two samples: shrimp paste processed with a pestle and shrimp paste produced using a grinder. The sensory test results are presented in Figure 1.

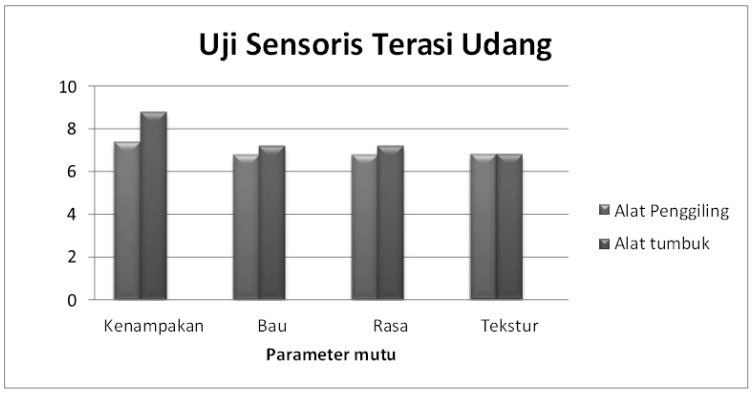

Figure 1. Organoleptic quality graph of shrimp paste

The data in Figure 1 shows the sensory testing of shrimp paste produced using two different grinding tools. The appearance value using a grinder is 7.4 and 8.8 with a traditional pounder, the odor value with a grinder is 6.8 and 7.2 with a traditional pounder, the taste value using a grinding machine is 6.8 and 7.2 with a traditional pounder, and the texture value is 6.8 for both the grinding tool and the traditional pounder. The test results show that the odor, taste, and texture parameters on the grinding tool are below the established standards, while the value that is below the standard on the traditional pounder is the texture parameter, this is adjusted to the SNI shrimp paste standard for sensory parameters which is at number 7 for each parameter.

Shrimp paste quality

The quality of shrimp paste is determined by the quality of the raw materials and the processing method used. Shrimp paste quality testing was conducted on two samples: one processed using a grinder and one processed using a traditional pestle. The quality parameters observed included moisture content, salt content, protein content, and ash content, as presented in Table 1.

Table 1. Composition of water, salt, protein, insoluble ash in shrimp paste water produced using traditional pestle and grinder.

No.	Quality parameters	Traditional pestle	Grinding tool	SNI (2015)
1	Water content	25,05	24,53	Maks 45
2	Ash Content	1,35	0,58	Maks 1,5
3	Protein Content	63,38	63,36	Min 15

4	Salinity	0,55	0,75	1,2 - 2,0

Based on the results of the average quality test of shrimp paste using a traditional pounder, the average water content is 25.05%, ash content is 1.35%, protein content is 63.38%, salt content is 0.55% and using a grinder where the water content is 24.53%, ash content is 0.58%, protein content is 63.36%, salt content is 0.75%. The results of the quality parameter test in Table 1 illustrate that both shrimp paste products have almost the same characteristics except for the ash content. Based on the test results and compared with the SNI value, it can be seen that the water content, ash content, protein content are at values that are almost in accordance with the provisions, but the value of the salt content can be considered average which is less than the set standard value.

DISCUSSION

Shrimp Paste Sensory

The sensory characteristics of shrimp paste are based on SNI 2716:2016 based on test parameters, namely appearance, odor, taste, and texture, assessed by 30 semi-trained panelists. According to Sayeti and Muryati (1980), the quality of shrimp paste is determined by appearance, color, odor, and the presence of insects, caterpillars, or maggots. Sensory test characteristics such as appearance, color, and odor are determined by the shrimp paste used. The fresher and more uniform the shrimp paste ingredients used, the higher the quality of shrimp paste. Sensory testing is a subjective test conducted by several panelists to determine whether a fishery product is suitable for public consumption. According to Aristyan *et al*. (2014), the average value of the level of acceptance of shrimp paste appearance is acceptable to consumers because it is higher than the minimum value requirement for shrimp paste products according to SNI, which is 7.0.

1. Appearance

Appearance is a characteristic of panelists' assessment of a product by combining color to texture of a product. Panelists assess appearance by looking at the color of shrimp paste because color is the first thing noticed by panelists. Color is one of the most important sensory quality elements in panelists' assessment of shrimp paste appearance because the first thing panelists will see is the color of a product (Permatasari, 2018). The external appearance of processed shrimp paste shows an average value of 7.4 in processing with a grinder and 8.8 in processing with a pestle. Where this appearance is seen from the aspect of cleanliness and the specific type of shrimp paste.

2. Smell

The odor of shrimp paste itself, based on panelist assessments, showed an average value of 6.8 when processed with a grinder and 7.2 when processed with a pestle. From these values, it can be concluded that the odor quality parameters in machine processing are below the established SNI standard. Odor is a factor that influences consumer interest in a food ingredient (Permatasari, 2018). According to Suwandi *et al*. (2017), during fermentation, microbes are able to transform chemical compounds, resulting in the production of volatile derivative compounds. This is also supported by Rahman and Iffan (2016), who stated that the aroma of shrimp paste is produced by shrimp paste fermentation. The aroma that appears in shrimp paste comes from volatile fatty acids (acidic odor), ammonia, and amines (ammonia-like odor). One of the components that form the taste and aroma of shrimp paste is simple sulfur compounds such as sulfides and disulfides, which cause the odor in shrimp paste.

3. Taste

Taste is a parameter of preference that determines the level of consumer acceptance or rejection of a product (Permatasari, 2018). The taste of a food is assessed using the sense of taste. This sense is found in the oral cavity, tongue, and palate. On the surface of the tongue there is a layer that is always wet where there are sensitive cells, these cells grouped to form papillae. Each papillae is sensitive to a specific taste (Setyaningsih *et al*. 2010). The taste of shrimp paste itself showed an average value of 6.8 when processed with a grinder and 7.2 when processed with a pestle, this value indicates that the taste of shrimp paste processed using machines is below the SNI standard. Taste parameters are assessed from very specific shrimp paste taste, specific shrimp paste taste, less specific shrimp paste taste. This is also supported by Karim (2014), during the fermentation process there is a process of breaking down proteins into amino acids, one of which is glutamic acid which is the source of the umami taste of shrimp paste.

4. Texture

To assess the texture of the product, you can touch it using your fingertips. According to Kadir *et al*. (2020), texture formation is influenced by the handling of the material before fermentation, namely the drying and pounding stages. According to Kadir *et al*. (2020), texture formation is influenced by the handling of the material before fermentation, namely the drying and pounding stages. Texture is a factor that determines the level of consumer acceptance using the sense of touch. The texture of shrimp paste itself shows a value of 6.8 when processed with a grinder and a pounder. Based on these tests, shrimp paste processing using machines and pounders is below the established SNI standard. Assessed from the texture of dense, compact, dense, less compact, not dense, dry, easily crushed. The texture of shrimp paste can be affected by water content, so the addition of water during the shrimp paste making process will affect the texture of the shrimp paste.

Shrimp Paste Quality

The shrimp paste quality test is based on SNI using two test samples, namely shrimp paste processed traditionally using a pestle and shrimp paste processed using a grinder.

1. Water Content

Water is the largest content in the body of fish. Water is a very important component for food ingredients because water can affect the appearance and texture of food. (Majid, 2014). The water content of the material indicates the amount of water content per unit weight of the material. The results of the water content test with two repetitions where the shrimp paste processed using traditional tools had results of 24.81% and 25.29% while the water content in the shrimp paste processed with a grinder had results of 24.60% and 24.46%. According to Dariyani et al. (2019), the higher the drying temperature, the faster the evaporation occurs, so that the water content in the material is lower and the length of the drying time will have a very large influence on the speed of water transfer.

The quality requirements for shrimp paste are based on SNI 2354.2:2015 for a maximum water content of 45%, and adjusted to the results of water content testing, it was found that the water content in shrimp paste was still within the average levels, namely 25.05% and 24.53%. It can be concluded that the fermentation process was running well and the rebon shrimp material did not rot.

2. Salt content

The results of the salt content test in processing using a traditional pounding tool obtained results of 0.58% and 0.53%, while processing using a grinding tool obtained results of 0.74% and 0.76%. Based on the quality requirements set by SNI 01-2359-1991, the maximum salt content is 1.2-2.0, it can be seen that the salt content value is below the average SNI value, the

possibility of the salt content factor being insufficient because during mixing, the amount of salt and water used to dissolve is not proportional to the amount of shrimp to be processed.

According to Murti *et al*. (2021), salt plays a crucial role in the fermentation process because it imparts flavor, controls fermentation, and inhibits the growth of spoilage-causing bacteria. Insufficient fermentation time can prevent halophilic bacteria from maximizing their salt utilization, thus affecting the salt content of the resulting shrimp paste. Salt functions as a preservative, reducing the free water content in food ingredients through osmotic processes and also acts as a microbial selector during the fermentation process (Thariq, 2014).

3. Ash content is insoluble in acid

The results of testing the content of acid-insoluble ash in shrimp paste when processed using a traditional crusher yielded results of 1.33% and 1.38%, while processing using a grinder yielded results of 0.68% and 0.49%. Based on the quality requirements set by SNI 2354.1:2001, the maximum acid insoluble ash content is 1.5%.

According to Suwandi (2017), the ash content insoluble in acid is influenced by the amount of impurities during the shrimp paste making process, the amount of minerals in the raw material itself because the raw material is a marine product, and the salt content of the material itself. Sahara *et al*. (2018), stated that the ash content depends on the type of material, the ashing method, the time and temperature used during drying. The longer the material is processed through the drying process, the higher the drying time and temperature will increase the ash content because the water that comes out of the material is greater.

4. Protein content

Based on the results of the protein content test, the results obtained were 63.43% and 63.34% when processed using a traditional pestle, while the protein content of shrimp paste when processed using a grinder was 63.38% and 62.87%. Based on the quality requirements set by SNI 01-2354.4:2006, the minimum protein content is 15%.

Protein is a nutrient that contains nitrogen, an essential factor for bodily functions. The main function of protein is to meet the body's need for nitrogen and amino acids. A lack of protein in the body can disrupt the body's metabolic processes and can reduce immunity (Bakhtra *et al*., 2017). Protein levels after fermentation decrease due to the fermentation process during the production of fish paste. This is in accordance with research by Anggo et al. (2014) which states that the longer the shrimp paste fermentation process, the lower the protein content produced. According to Peralta *et al*. (2019), fermentation is the decomposition of protein into simpler compounds (amino acids) under controlled conditions through biological or semi-biological decomposition processes.

CONCLUSION

The quality of shrimp paste in Kaukau village, based on water content, ash content, and protein content, was considered quite good based on sensory tests. However, the average salt content was still below the standard set by the Indonesian National Standard (SNI). Sensory tests showed that the quality of shrimp paste met the standard only in terms of appearance.

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