

## Nutritional Content of Dried Anchorage (*Stolephorus sp.*) with Blanching Method

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### Abstract

A fishery commodity that is one of the leading commodities for fisheries in Barru Regency is anchovies (*Stolephorus sp.*). Salted fish is a processed fish that is preserved with the addition of crystal salt. Blanching is a heat process that uses hot water or steam, and this heating generally takes place at a temperature of 85°C. This study aims to determine the nutritional content of dried anchovies (*Stolephorus sp.*) using the blanching method. This research will be carried out in April 2025. This test was carried out at the Fisheries Product Biochemistry Laboratory of the Pangkajene and Islands State Agricultural Polytechnic. This research method uses experimental laboratories with two treatments and 3 repetitions. Sample A (blanching method), sample B (without blanching method), analysis data using the Anova test. The results showed that the dry anchovy blanching method improved the chemical quality of dried anchovies, where the value of moisture content (A 31.93%), ash content (16.34%), and protein content (72.50%) was higher and had a real effect on the blanching method ( $P < 0.05$ ). In conclusion, dried anchovies blanching method affects chemical quality.

**Keywords:** blanching method; nutritional content; *Stolephorus sp.*

### Abstrak

Komoditas perikanan yang menjadi salah satu komoditas unggulan perikanan di Kabupaten Barru adalah ikan teri (*Stolephorus sp.*). Ikan asin merupakan olahan dari ikan yang diawetkan dengan ditambahkan garam kristal. Blanching merupakan proses panas yang pengoperasiannya menggunakan air panas atau uap air dan pemanasan ini umumnya berlangsung pada suhu 85°C. Penelitian ini bertujuan untuk mengetahui kandungan nutrisi ikan teri kering (*Stolephorus sp.*) dengan menggunakan metode blanching. Penelitian ini dilaksanakan pada bulan April 2025. Pengujian ini dilaksanakan di Laboratorium Biokimia Hasil Perikanan Politeknik Pertanian Negeri Pangkajene dan Kepulauan. Metode penelitian ini menggunakan experimentar laboratories dengan dua perlakuan dan 3 pengulangan. Sampel A (metode blanching), sampel B (tanpa metode blanching), data analisis menggunakan uji Anova. Hasil penelitian menunjukkan bahwa metode blanching ikan teri kering meningkatkan mutu kimia pada ikan teri kering, dimana nilai kadar air (A 31,93%), kadar abu (16,34%), dan kadar protein (72,50%) lebih tinggi serta berpengaruh nyata dengan metode blanching tersebut ( $P < 0,05$ ). Kesimpulannya ikan teri kering metode blanching mempengaruhi mutu kimia.

**Kata Kunci:** kandungan nutrisi; metode blanching; *Stolephorus sp.*

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## INTRODUCTION

Barru Regency, South Sulawesi Province, has considerable potential for fishery resources, one of which is anchovies (*Stolephorus sp.*) which is a leading commodity in capture fisheries. In 2023, anchovy production in the waters of Barru Regency was recorded at 1,398.1 tons or around 6.9% of the region's total fishery production, demonstrating the strategic role of this commodity in supporting the economy of coastal communities and local

food security (Dinas Perikanan Barru, 2023). Globally, anchovies are also known as an important source of animal protein that is widely consumed in Asian and Mediterranean countries, both in fresh and dried form (FAO, 2020).

Anchovies are small pelagic fish that live in large groups and have a relatively small size, ranging from 6–9 cm. Despite its small size, anchovies have a high nutritional value, especially as a source of protein, calcium, and phosphorus which play an important role in meeting the nutritional needs of the community (Nurainy, 2022). International research shows that small fish consumed whole, such as anchovies, contribute significantly to the intake of essential micronutrients, including calcium and iron, especially in developing countries (Hicks et al., 2019). Therefore, anchovy processing is not only economically valuable, but also strategic in improving the nutritional quality of the community.

One of the most common forms of anchovy processing carried out by coastal communities is drying into salted anchovies. However, the quality of dried anchovies is greatly influenced by the quality of raw materials, salt concentration and purity, processing methods, and drying techniques used (Bjørnevik et al., 2018). Several studies show that the quality of salted fish in various regions still varies and often does not meet the established quality standards, such as the Indonesian National Standard (SNI 01-2721-2009). Fahmi et al. (2015) reported that salted anchovies with a storage period of 28 days have a relatively high moisture content, which is 59.6%, which has the potential to reduce shelf life and product quality.

Efforts to improve the quality of dried anchovies require innovation in the processing process, one of which is through the application of the blanching method. Blanching is an initial heat treatment that uses hot water or steam at high temperatures, generally around 80–100°C in a short period of time (Fellows, 2017). This process is widely applied in the food industry as a pre-processing stage to improve product quality and stability. Blanching is known to be able to inactivate destructive enzymes, such as polyphenoloxidase and lyoxglycenase, which can cause browning and tightness in fish products (Rahman, 2007).

In addition to inactivating enzymes, blanching also plays a role in reducing the number of initial microorganisms, removing attached impurities, and improving the texture of fish tissue so that it is more flexible and easier to process further (Herliani, 2008). Several international studies report that proper blanching treatment can maintain the nutritional quality of fish, especially protein content, as well as improve the food safety of dry fishery products (Ghaly et al., 2010). However, uncontrolled heat treatment also has the potential to cause loss of certain nutrients, so further studies are needed regarding the effect of blanching on the nutritional content of dried anchovies.

Based on this description, this study is important to study the nutritional content of dried anchovies (*Stolephorus* sp.) processed by the blanching method. The results of the research are expected to make a scientific contribution to the development of higher quality, high nutritional value, and in accordance with food safety standards, while supporting the increase in the competitiveness of local fishery products in Barru Regency at the national and international levels.

## METHOD

This research will be carried out in April 2025 with a sampling location in the "New Business" processing group owned by Mr. Rappe which is located at Jl. Anggrek Ujung, Sumpang Binangae Village, Barru District, Barru Regency, South Sulawesi. Chemical analysis including moisture content, ash content, and protein content was carried out at the Fishery Product Biochemistry Laboratory of the Pangkajene and Islands State Agricultural



Polytechnic. The study used a nonfactorial Complete Random Design (RAL) with two treatments, namely dried anchovies with the blanching method and without blanching, each with three replicas so that six experimental units were obtained. The blanching process is carried out by steaming fresh anchovies at a temperature of  $\pm 120^{\circ}\text{C}$  for 7–10 minutes with the addition of a limited amount of salt, then dried using sunlight for 2–3 days until it reaches a dry condition. Moisture content analysis was carried out using the oven method at a temperature of  $100^{\circ}\text{C}$  to a constant weight, ash content was determined using the evaporation method at  $650^{\circ}\text{C}$ , while protein content was analyzed using the Kjeldahl method with a nitrogen conversion factor of 6.25 (AOAC, 2016; Hadinoto, 2018). The data obtained were statistically analyzed using the One-Way ANOVA test through the SPSS program to determine the difference in the nutritional content of dried anchovies due to blanching and non-blanching treatment at a confidence level of 95%.

## RESULT AND DISCUSSION

The results of the anchovy research with the analysis of the moisture content, ash, and protein content of dried anchovies, which are divided into two groups, namely salted fish that are blaced (A) and those that are not blaced (B), can be seen in table 1 below:

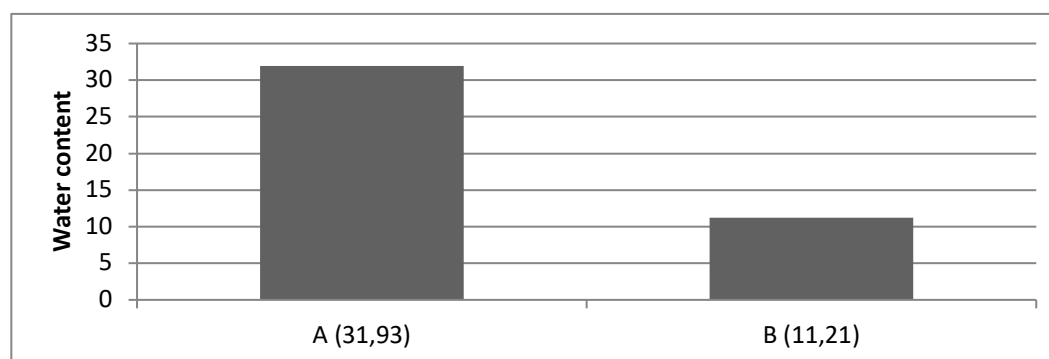
**Table 1:**  
**Final Data on Moisture Content, Ash Content, and Protein Content of Dried Anchovies**

NO	Sample Code	Analysis Parameters	Analysis Results/ Rates (%)			Average
			Detestation 1	Detestation 2	Detestation 3	
1	A	Water content (%)	31.94	32.03	31.81	31.93
	B		11.88	11	10.76	11.21
2	A	Ash Content (%)	15.81	16.79	16.42	16.34
	B		13.66	13.06	15.36	14.03
3	A	Protein Content (%)	49.63	48.92	48.69	49.08
	B		72.35	72.16	73	72.50

Data Source: Data processing results, 2025

The results of the test of dried fish made from anchovies (*Stolephorus* sp.) presented in Figure 1:

**Figure 1:**  
**Moisture Content Test Graph**



Sumber: hasil olah data, 2025



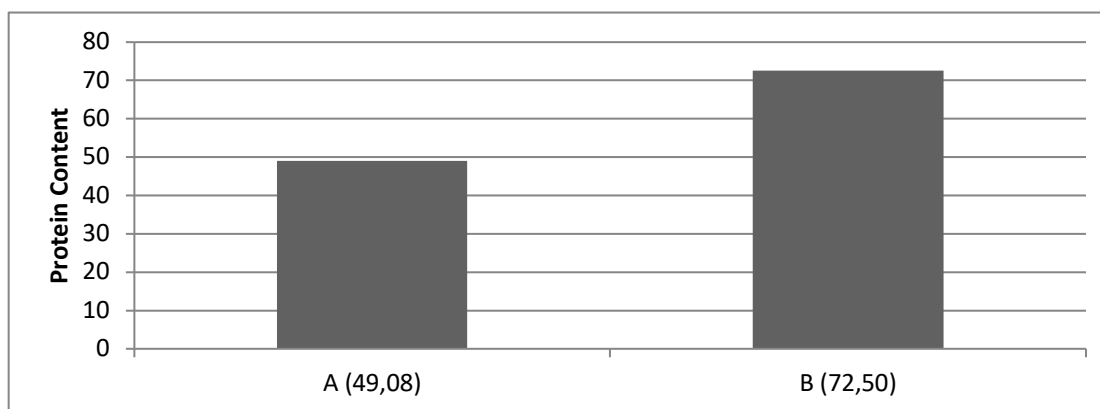
In the study on the nutritional content of salted fish, the results obtained showed a significant difference between salted fish that was blaced (A) and that was not blaced (B) in terms of moisture content. The measurement results showed that the moisture content of salted fish (A) reached 31.93%, while the moisture content of unbleached salted fish (B) was only 11.21%. The blanching process has been shown to be effective in reducing salted fish moisture, which can be seen from this striking difference (Kurniawan et al., 2025).

From a nutritional point of view, the lower moisture content in unblaced salted fish (B) implies a higher concentration of nutrients per unit of weight. This is in line with the concept that reducing the moisture content in food products tends to increase the ratio of nutrients, such as proteins and minerals (Wahyudi, 2024). Therefore, although unblaced salted fish may have a lower moisture content, it can be considered more nutrient-dense. However, it is important to note that the blanching process also has its own benefits, such as improving food safety and extending the shelf life of the product.

Furthermore, normality analysis was carried out using the Shapiro-Wilk test, considering that the number of samples used was less than 50. The significance values obtained in samples A and B were 0.800 and 0.391 respectively ( $p > 0.05$ ), indicating that the data were normally distributed. In addition, the ANOVA test conducted on the moisture content showed a significance value of 0.000, which means that the treatment given had a significant effect on the moisture content of salted fish. This confirms that the processing method applied has a significant impact on the physical and nutritional characteristics of the salted fish tested

The results of the test of dried fish protein levels made from anchovies (*Stolephorus* sp.) is presented in Figure 2.

**Figure 1:**  
**Protein Levels Test Graph**



Source: data processing results, 2025

The results showed that the protein content of salted fish that underwent the blacing process (A) was 49.08%, while salted fish that was not blaced (B) had a higher protein level, which was 72.50%. This significant difference confirms that the blacing process can affect the nutritional content of salted fish. Blacing, which involves heating and dyeing in hot water, aims to kill microorganisms and extend the shelf life. However, the negative effect of this process is a decrease in protein levels, where some of the protein is denatured and released into the water.

Heating has a complex impact on the structure of proteins. In some cases, heating can increase protein accessibility, but in the context of blacing, the effect actually reduces



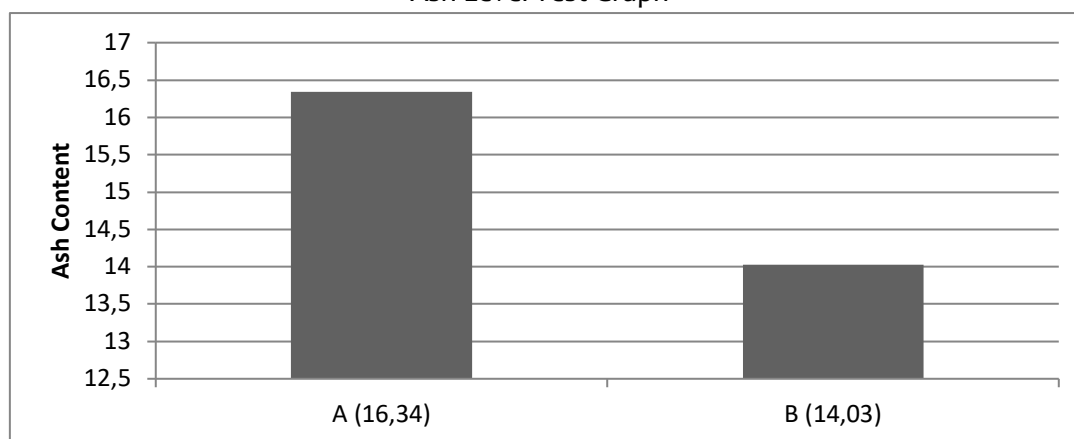
nutritional value. This is in line with theories that high temperatures can lead to protein denaturation, which in turn reduces the amount of protein available for absorption by the body (Azara et al., 2024). While blacing offers benefits in terms of food safety, it is important to consider its impact on the nutritional value of food.

Normality analysis of protein levels showed significance values of 0.452 and 0.415 ( $p > 0.05$ ), indicating that the data were normally distributed. In addition, the ANOVA test on protein levels obtained a significance value of 0.000 ( $p < 0.050$ ), which indicates a significant influence of different treatments on protein levels. These findings show that the treatment method applied not only affects the moisture content, but also directly impacts the protein content of salted fish.

Overall, the results of this study emphasize the importance of considering the balance between food safety and nutritional value in salted fish processing. Although blacing provides an advantage in terms of safety, the decrease in protein levels indicates the need to explore alternative methods that can maintain nutritional value while still guaranteeing product safety.

The results of the test on dried fish ash made from anchovies (*Stolephorus sp.*) Presented:

**Figure 3:**  
Ash Level Test Graph



Source: data processing results, 2025

The results showed that the ash content in blaced salted fish (A) was 16.34%, while the ash content in non-blaced salted fish (B) was recorded lower, which was 14.03%. This ash content reflects the amount of minerals contained in salted fish. The blacing process, which involves heating, can affect the mineral composition and cause ash levels in blaced salted fish to be higher.

Heating during the blacing process can change the composition of nutrients, including minerals. While there is the potential for loss of some nutrients in this process, the minerals that remain in salted fish can be concentrated, leading to increased ash levels. This is in line with previous research that states that heat treatment can reduce water content and increase mineral concentrations in the final product (Syafii and Fajriana, 2022). Therefore, although ash levels are higher in blaced salted fish, it is important to evaluate the benefits and risks resulting from such processing processes on overall nutritional quality.

Analysis of ash content data in samples A and B showed significance values of 0.732 and 0.485 ( $p > 0.05$ ), which means that the ash content data is normally distributed. In addition,



the treatment test given to determine the ash content produced a significance value of 0.036 ( $p < 0.05$ ). This shows a difference in the average ash content before and after treatment.

From the results of this study, it is known that it is important to understand how processing processes such as blanching can affect the mineral composition of salted fish. Although higher ash levels may indicate a higher concentration of minerals, a thorough evaluation of the impact on nutritional value should still be carried out to ensure that the nutritional quality of salted fish is maintained.

## CONCLUSION

Based on the results of the study, it can be concluded that the application of the blanching method in the processing of dried anchovies (*Stolephorus sp.*) has a real effect on the chemical quality of the product, especially moisture content, ash content, and protein content. Blanching treatment results in higher moisture and ash content than without blanching, indicating changes in tissue structure and mineral concentration due to heat treatment. On the other hand, the protein levels of dried anchovies without blanching were shown to be higher, indicating that the blanching process could potentially lead to denaturation and partial loss of protein during heating. The ANOVA statistical test showed that the difference in treatment had a significant effect on the three parameters at a confidence level of 95 percent. These findings confirm that blanching methods can improve certain aspects of chemical quality and product safety, but they need to be carefully considered because they have an impact on reducing protein content, so the selection of processing methods should be tailored to the main purpose of production, whether it emphasizes on product safety and stability or on optimizing the nutritional value of dried anchovies.

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