Analyzing The Chemical Composition of Cold Stored Traditional Fish Floss from Ambon City

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Abstract. *Fish floss is a manufactured fish product composed of fish meat along with other components, including oil, coconut milk, and spices. This composition makes it delicate and prone to damage when exposed to air. The purpose of cold storage of fish floss is to prevent its deterioration. This study aimed to investigate the chemical composition of traditional fish floss that has been preserved at low temperatures for 30 days. The methodology employed involved conducting laboratory analysis of two conventional fish floss products sourced from Ambon City: AL floss and HB floss. Prior to and following storage, the chemical composition of the fish floss was examined, including water, ash, protein, fat, carbohydrates, acid-insoluble ash, and crude fiber. The findings indicated a decline in water and protein concentrations, whereas the amounts of fat and acid-insoluble ash increased. The ash content showed a rise in AL floss, while it demonstrated a decrease in HB floss. The amount of crude fiber dropped in the AL floss but increased in the HB floss. The water, ash, protein, and fat levels of the fish floss remained within the acceptable range for the fish floss quality criteria, even after storage.*

Kecywords: *Fish floss, crude fiber, Traditional, Cold Stored*

I. INTRODUCTION

Floss is a type of processed food used to preserve meat. It is usually made from processed beef, chicken, and fish and has a shredded or separated fibrous appearance. According to SNI 01-3707-1995, floss is a distinctive dry food made from boiled, sliced, seasoned, fried, or pressed meat.

Floss products are a form of meat preservation that extends their shelf life. Fish floss is a processed seafood product prepared from fish meat or seasoned fish. Processing involves boiling, frying, pressing, or separating the oil. Fish floss is soft, tasty, and relatively long-lasting (Studi et al., 2017).

Fish floss contains ingredients such as oil, coconut milk, and spices, making it sensitive to air and prone to rancidity during storage. Although pressing is performed to remove oil content, not all oil can be eliminated (Tridayani, 2012). The processing of fish floss varies depending on the type of fish, additional ingredients used, and processing methods, resulting in different chemical compositions and qualities of fish floss.

Traditional fish floss is typically packaged after cooking. In small-scale industries, floss is packaged in polyethylene plastic and sealed. Packaging floss in this manner does not guarantee long-term product durability. Several studies have shown that storage temperature can affect floss quality. During storage, floss continues to experience a decrease in quality due to the chemical and physical changes that occur during storage.

Preventive measures against damage to packaged floss taken by household floss-processing industries include storing floss under refrigerated conditions. The combination of packaging and cold storage is a preventive measure against floss damage. The results of two studies on fish floss showed that different storage temperatures and packaging can affect floss quality. Traditional floss products from Ambon City packaged in

polyethylene plastic do not yet have nutritional information on the floss. Therefore, it is necessary to analyze the chemical composition of the floss. The purpose of this research is to analyze the chemical composition of traditional floss brands AL and HB before and after refrigerated storage.

2. RESEARCH METHOD

The research methodology employed was laboratory analysis. Two conventional fish floss products in Ambon City, AL Fish Floss and HB Fish Floss, were enclosed in polyethylene plastic packaging and kept at a temperature of 5°C for 30 days. Chemical analysis of fish floss was conducted both before and after preservation.

Materials

The primary components of fish floss are smoked skipjack tuna and dried halfbeak fish. Fish floss seasoning comprises garlic, shallots, salt, curly chilies, small chili peppers, coconut milk, cooking oil, lemongrass, ginger, galangal, bay leaves, kaffir lime leaves, and lime.

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Chemical Analysis

The fish floss underwent chemical analysis to determine its moisture content using the drying oven method (AOAC, 2005), protein content using the Kjeldahl method (AOAC, 2005), ash content using the dry ashing method (AOAC, 2005), fat content using the Soxhlet method (AOAC, 2005), and acid-insoluble ash and crude fiber content (AOAC, 1970). Duplicate chemical analysis was performed.

3. RESULTS AND DISCUSSION

The chemical composition of traditional fish floss on day 0 and day 30 of cold storage is presented in Table 1.

Table 1. Chemical composition of traditional fish floss on day 0 and day 30

Chemical	Unit	Day-0, room temp		Day-30, Temp 5°C	
		AL	HB	AL	HB
A		B	C	B*	C*
Water	%	13,32	12,85	12,39	10,28
Ash	%	4,90	6,39	6,12	4,38
Protein	%	49,39	61,88	48,54	55,04
Lipid	%	15,66	21,23	16,99	24,08
Carbohydrate	%	6,25	4,89	4,18	5,68
Acid insoluble ash	%	0,02	0,04	0,04	0,06
Crude fiber	%	1,61	1,00	1,12	1,06

Water Content

Water is an important component of foodstuffs because it affects the acceptability, appearance, freshness, texture, and taste of food (Aditya et al. 2016). The results of the study in Table 1 show that the water content of AL and HB fish floss ranged from 10.28% to 13.32%. Both fish flosses, after storage, could meet the required water content according to SNI 01-7690.1:2013, which is a maximum of 15% (BSN, 2013).

The water content of the floss decreased after cold storage, where the decrease in AL floss was lower (0.93%) than that in HB floss (2.5%). The water content of floss is influenced by different floss cooking methods. Traditional floss processing methods using traditional equipment can affect the chemical composition of the floss. The water content of these two traditional flosses is higher than that of catfish floss (2.59%) made using a Spinner pulling oil, a tool to reduce the water and fat content of food products (Argo et al., 2018).

The use of polyethylene packaging is effective in protecting fish floss. Polyethylene packaging is impermeable to water and water vapor and has good density. These properties prevent water from easily entering food and evaporating from the fish floss (Antri Jayatri, 2016). The water content of a product affects its appearance, texture, and taste. Water content is an important indicator of dry products because an increase in water content can result in a decrease in quality owing to chemical reactions or the growth of spoilage microorganisms (Kasmiati et al., 2020).

Ash Content

The ash content in foodstuffs indicates the amount of inorganic material remaining after the organic material is destroyed (Aditya et al., 2016). The ash content of the traditional fish floss ranged from 4.90% to 6.79% (Table 1). The ash content values met the standard SNI 01-3707-1995 (BSN, 1995) for fish floss, which is a maximum of 7%. The ash content indicates the content of inorganic material remaining after the organic material is destroyed, which is influenced by the type of material and combustion method. If the material is

not entirely destroyed during combustion, the ash content can increase. A high ash content indicates the presence of minerals that are not burned into evaporable substances. The high ash content of the traditional fish floss is consistent with its water content.

Protein Content

The protein content of traditional fish floss obtained is 48.54% to 61.88% (Table 1) and meets the quality standard for floss, which is a minimum of 15% (BSN, 1995). The protein content of the HB fish floss was higher than that of the AL fish floss. The protein content indicates the type and amount of fish used to make the floss. After cold storage, the protein content of the floss decreased. This decrease in protein content was consistent with the decrease in water content. If the water content is high, the protein content is low, and vice versa.

This traditional fish floss from Ambon City was higher than tuna and mackerel fish floss, at 21.66% and 24.44%, respectively (Huthaimah et al., 2017), as well as herring and mackerel fish floss, at 21.14% and 20.71%, respectively (Aditya et al., 2016), and catfish floss (43.30%) (Jasila and Zahro, 2017). Differences in protein content in floss can occur owing to differences in the types and compositions of raw materials used and manufacturing methods.

Fat Content

In addition to water and protein, fat is one of the main components found in foodstuffs and plays a significant role in determining their characteristics (Aditya et al., 2016). The analysis of the fat content in a product aims to determine the fat content in the food product. The research results show that the fat content of traditional fish floss obtained ranges from 15.66% to 24.08% (Table 1). The fat content of traditional floss is still below the limit required by SNI 01-3707-1995 (BSN, 1995), which is a maximum of 30%. Fat content is related to the ingredients used, namely cooking oil and coconut milk. Coconut milk with a high fat content is used to enhance the savory taste of the floss. The high fat content of fish floss is due to the high oil absorption by the ingredients during frying. On the other hand, no pressing is done or pressing is done, but not optimally, leaving a large amount of oil in the floss. According to Huthaimah et al. (2017), the absorption of oil by the ingredients during frying can increase the fat content of the ingredients. The fat content of fish floss can also be caused by the spices used in the floss-making process (Huda et al., 2012). The increase in fat content during storage is suspected to be due to fat oxidation in the fish floss (Cecilia et al., 2017). The floss packaging process without vacuum triggers oxidation processes, albeit relatively slow at cold temperatures, and polyethylene packaging has good gas permeability properties.

Ash Insoluble in Acid Content

The requirement for ash insoluble in acid content in floss, according to the Indonesian National Standard SNI 01-2891-1992, is a maximum of 0.1%. The ash insoluble in the acid content of traditional fish floss does not meet the quality requirements for floss. High levels of ash insoluble in acid content decrease consumer acceptance. The ash insoluble in acid content was used to determine the external ash content originating from impurities. A high level of ash that is insoluble in acid indicates the presence of impurities in the material. Setting quality standards serves as a reference to ensure that a product is of good quality and safe for consumers. Traditional floss producers are advised to produce floss products that meet the Indonesian National Standard (SNI).

Crude Fiber Content

The crude fiber content of Indian scad floss in this study ranged from 1.00% to 1.61% (Table 1). The crude fiber content of the AL fish floss was higher than that of the HB fish floss. Only the crude fiber content of HB fish floss met the requirements of SNI 01-3707-1995 for fish floss, which is 1% (BSN 1995). The high crude fiber content in this study was influenced by the additional ingredients used, namely ground spices, except for bay leaves and lime leaves. The spices used have a high fiber content, such as dried galangal (11.55 %) and lemongrass (35.03 %) (Sari et al., 2017).

The presence of fibers in floss not only provides a fibrous texture, but can also enhance the color and volume of the floss, as well as have health benefits (Kasmiati et al., 2020). Dietary fiber plays a role in health because it can bind bile acids and provide a feeling of fullness. Therefore, the addition of dietary fiber to fish floss can increase consumer preference for fish floss (Winarno, 2012). The crude fiber content can be influenced by the frying temperature. Kusumawati et al. (2012) reported that blanching process at 80°C for 10 minutes can reduce the crude fiber content of jackfruit seed flour.

4. CONCLUSION

1. The chemical compositions of AL and HB floss differ. HB floss has a greater amount of protein and fat compared to AL floss.
2. On the 30th day, the levels of air, protein, and crude fiber in the AL shredded floss decreased, whereas the levels of fat, acid-insoluble ash, and crude fiber in the HB floss increased.
3. The traditional fish floss from Ambon City fulfilled the chemical criteria and quality standards set by SNI 01-3707-1995 and 7690.1:2013 (Indonesian National Standardization Agency) for water content. ash, protein, and fat content.

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