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Effect Of Tuna Flour Addition On Physical, Chemical, And Organoleptic Properties Of Crackers Physical, Chemical, And Organoleptic Properties Of Crackers

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Abstract: Crackers available in the market only provide a small portion of daily protein needs. Tuna (Euthynnus affinis) belongs to the Scombridae class and is an important commodity in Indonesia. The high nutritional value of tuna fish includes a considerable amount of protein, ranging from 22.6-26.2 g/100 grams of meat. Of the various ingredients that can be added to increase the protein content of crackers, one option is to use tuna flour due to its high protein content. This study aims to identify the optimal ratio and drying period for certain chemical properties as well as considering color, aroma and taste preferences by panelists as well as the shelf life of popular tuna crackers. The parameters used in this study include moisture content, ash content, fat content, protein content which measures the nutritional value; pH which indicates the level of acidity; swelling strength as an indication of textural quality along with organoleptic tests (taste, color, aroma and overall preference) which enables sensory evaluation analysis. The results showed that crackers with the addition of tuna flour have met the quality requirements of SNI 2973-2018. The tuna flour crackers formulation has a moisture content of 0.4%, ash content of 0.2%, protein content of 7.11%, fat content of 16%, pH of 6.48-6.50 and expandability of 0.6%.

Keywords: tuna, tuna flour, crackers

INTRODUCTION

Tuna (Euthynnus affinis) is one type of marine fish that is widely found in Indonesian waters. The nutritional content of tuna is quite high protein up to 26%, omega 3 fats, and high mineral salts (Yenima et al, 2020). The content of essential unsaturated fatty acids essential fatty acids in the nutritional composition of fish is very necessary for the body. Tuna also contains vitamin A, vitamin B, sodium, and phosphorus. According to Cilia et al (2016) mentioned that fish flour tuna has a fat content of 6.29%; ash content of 10.30%; crude fiber of 2.57%; and BETN of 10.79%. BETN 10.79%. Tuna meat can be processed into a form of flour that can be used for food and non-food applications (Deslianti et al., 2016).

Crackers are a type of dry food that is usually consumed with refreshing drinks such as coffee and tea as a snack. The process of making crackers through fermentation using the basic ingredients of wheat flour, salt, fat, and yeast. The protein content of commercially sold crackers only fulfills about 5-8% of the daily protein requirement. So it is necessary to substitute the basic ingredients of wheat flour with other flour ingredients that have a high protein content, one of which is tuna flour. Tuna flour contains a lot of protein and calcium derived from animal food (Ernisti et al., 2018). The use of tuna flour for making crackers is also an effort to

support government policies in promoting the movement to make a culture in the community to consume fish (GEMARIKAN).

Based on this introduction, the author conducted research on tuna crackers products with tuna flour substitution on the chemical characteristics of crackers. The purpose of this study was to determine the best ratio and length of drying time on the physical and chemical characteristics of tuna crackers.

METHOD

The ingredients that will be used in making these crackers include 135 ml warm water, 1 $^1/_2$ tsp yeast, 250 grams low protein flour, 20 grams meizena, $^1/_4$tsp baking soda, $^3/_4$ tsp salt, 40 grams butter, tuna flour. Materials to be used in the proximate test include distilled water, sodium acetate, acetic acid, biuret reagent, Bovine Serum Albumin (BSA) mother liquor, ammonium sulfate, acetate buffer pH 5, acetate buffer pH 4, acetate buffer pH 7, (C2H5)O2, diethyl ether.

The tools used in making crackers include a steamer, knife, stove, basin, spoon, cooper, oven, spatula, mixer, baking sheet, pan, sieve, mold, scales, gloves, knife, scissors, grinder. Tools used for proximate tests include filter paper, aluminum foil, porcelain cup, vortex, erlenmeyer, beaker glass, measuring cup, hot plate, measuring flask, oven, micropipette, test tube, pH meter, furnace, spectrophotometer, stirring rod, furnace, moisture meter, Soxhlet, desiccator.

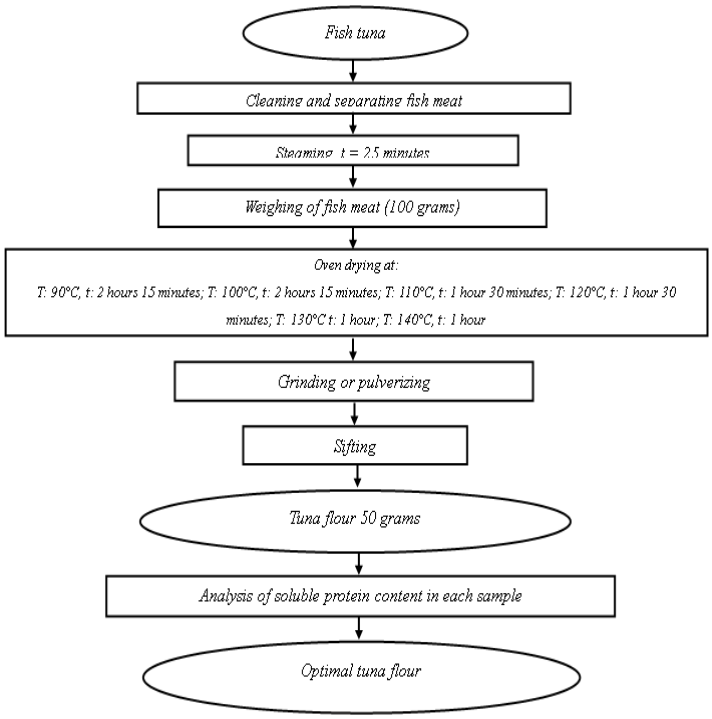

Figure 1 The process of making tuna flour

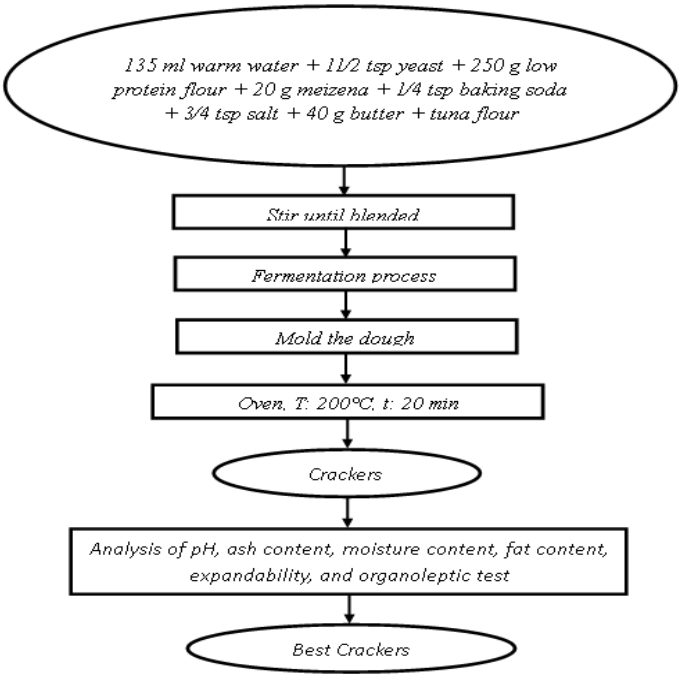

Figure 2 The process of making crackers

RESULTS AND DISCUSSION

Table 1 Research results

Parameter		Total
Organoleptic Test	Colour of Crackers	3,70
	Aroma of Crackers	3,01
	Flavour of Crackers	2,9
	Texture of Crackers	3,75
	Favorite of Crackers	2,51
Protein Content of Fish Tuna Flour		10,815%
Protein Content of Crackers		7,106%
Ash Content of Crackers		0,2%
Water Content of Crackers		0,4%
Fat Content of Crackers		16%
pH of Crackers		6,50
Expandability of Crackers		0,6 cm

Based on the organoleptic test that has been carried out, the best results are obtained in sample formulations 1 and 2. This is due to the large number of panelists who do not like the fishy smell on crackers. So that the higher the formulation of giving tuna flour, the more pungent the smell of fish produced, the more disliked it is.

In the study of protein content of tuna flour that has been carried out, the highest results are in the sample with a temperature of 90oC with a time of 2 hours 15 minutes. The longer the heating process is carried out on the fish, the smaller the protein content contained will be. So that variations 1 and 2 are considered very good for use in the advanced process of making products (crackers).

The protein content of crackers increased along with the increase in the level of tuna flour included in each formulation. It can be concluded that the addition of tuna flour to all crackers formulations has an influence on protein content. Protein content is strongly influenced by the formulation of raw materials, while the

roasting process treatment does not make a difference to the protein content of the product, because the process occurs in a very short time. The standard for protein content in crackers is in accordance with SNI 2973: 2018 which is at least 5%.

Ash content can increase when the amount of fishmeal included in each formulation increases. It can be concluded that the addition of fishmeal to all crackers formulations has an effect on ash content. Ash content is the mineral content contained in a food ingredient. Because, ash content is an inorganic substance from the remnants of the combustion of an organic material. The standard for ash content in crackers is in accordance with SNI 2973: 2018, which is a maximum of 1.6%.

It can be concluded that the addition of tuna flour to the crackers formulation has an influence on water content. The presence of total water content is due to the absence of water content in tuna flour and the presence of additional water in the crackers dough. So that the water content in these crackers is not completely lost. With the low percentage of water content in each sample, it can support the shelf life of the product so that the shelf life is longer and reduce the changes in the product. Product moisture content can be influenced by several factors including the raw materials used, fillers and the method of making the product. The standard for moisture content in crackers is in accordance with SNI 2973: 2018, which is a maximum of 5%.

It can be concluded that the addition of tuna flour to the crackers formulation has an influence on fat content. The presence of fat content is due to the addition of tuna flour in each formulation. However, if the fat content is too high, it is also not good because high fat content in food ingredients can cause rancidity. The standard for fat content in crackers is in accordance with SNI 2973: 2018, which is at least 7%.

The pH level in crackers is due to the fermentation process of the dough and the process of baking so that there are changes. So that glucose can be fermented by yeast which will break down sugar into alcohol and CO2 gas, and reduce the pH in the dough to 4.7-4.8. The CO2 gas produced will fill the empty space and cause the development of the dough.

The development of crackers dough occurs due to the presence of yeast and baking soda so that there is a change in size when baked. When kneading, water will be absorbed by starch and trap air and the expansion process stimulated by amylopectin. The volume of dough development increases due to an increase in the length of proofing time. The metabolic activity of yeast will cause the volume of bread to expand because more CO2 gas is produced due to the longer fermentation process.

CONCLUSION

The conclusion of the results of the research that has been done is that the use of fishmeal as a supplementation material in making crackers can be used as an alternative to produce new products with better nutritional content.

The addition of tuna flour to the crackers produced gives a good effect, and produces new products with high quality nutritional content. Crackers with the addition of tuna flour have protein levels crackers with the addition of tuna flour have met the quality requirements of SNI 2973: 2018. The formulation of crackers with tuna flour has a moisture content of 0.4%, ash content of 0.2%, protein content of 7.11%, fat content of 16%, and growth capacity of 0.6%. The optimal formulation based on SNI 2973: 2018 is in the 250 + 50 formulation, because the protein content in the formulation is in accordance with SNI rules, not too high and also not too low compared to the other two formulations. However, when viewed from the aspect of liking or interest, the level of panelist acceptance of crackers formulation 250 + 25 is also quite high compared to the other two crackers formulations, this is due to the decrease in fishy odor produced from these crackers.

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