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ORGANOLEPTIC TESTS OF PEMPEK WITH VARIOUS SURIMI FORMULATIONS OF SANGKURIANG CATFISH (*Clarias gariepsinus*)

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ABSTRAK

Penelitian ini bertujuan untuk mempelajari berbagai formulasi surimi ikan lele Sangkuriang (*Clarias gariepsinus*) terhadap pempek yang dihasilkan, dengan metode eksperimen menggunakan Rancangan Acak Kelompok (RAK) yang disusun secara Non Faktorial dengan satu perlakuan berbagai formulasi surimi ikan lele Sangkuriang (*Clarias gariepsinus*) yang terdiri dari enam faktor dan diulang sebanyak empat kali. Hasil uji organoleptik pempek dengan uji hedonik terhadap warna, aroma, dan rasa. Nilai tingkat kesukaan tertinggi terhadap warna pempek berbahan baku surimi ikan lele sangkuriang terdapat pada perlakuan L_1 (surimi ikan lele sangkuriang 0,25 bagian dan tepung tapioka 1,00 bagian) dengan warna pempek putih bersih khas pempek ikan dengan nilai rata-rata 4,30 (kriteria disukai panelis). Nilai tingkat kesukaan tertinggi terhadap rasa dan aroma pempek berbahan baku surimi ikan lele sangkuriang terdapat pada perlakuan L_6 (surimi ikan lele sangkuriang 1,50 bagian dan tepung tapioka 1,00 bagian) dengan rasa gurih dan aroma khas pempek yang dominan dengan nilai rata-rata 3,90 (kriteria agak disukai panelis) dan 4,30 (kriteria disukai panelis).

Kata Kunci: Pempek, Ikan lele sangkuriang, Surimi

ABSTRACT

This study aims to study various surimi formulations of Sangkuriang catfish (*Clarias gariepsinus*) for the resulting pempek, using the experimental method using a Randomized Block Design (RBD) arranged in a non-factorial manner with one treatment of various formulations of surimi Sangkuriang catfish (*Clarias gariepsinus*) consisting of of six factors and repeated four times. Pempek organoleptic test results with hedonic tests on color, aroma, and taste. The highest

preference value for the color of pempek made from Sangkuriang catfish surimi in the L1 treatment (0.25 parts of sangkuriang catfish surimi and 1.00 parts of tapioca flour) with a clean white pempek color typical of fish pempek with an average value of 4.30 (criterion panelists liked). The highest preference value for the taste and aroma of pempek made from sangkuriang catfish surimi was found in treatment L6 (1.50 parts of sangkuriang catfish surimi and 1.00 parts of tapioca flour) with a savory taste and dominant pempek aroma with an average value of 3 .90 (panelists preferred criteria) and 4.30 (panelists preferred criteria).

Keyword: Pempek, Sangkuriang catfish, Surimi.

INTRODUCTION

One of the most abundant freshwater fish commodities in Indonesia is the Sangkuriang catfish (*Clarias gariepsinus*) and have big potencies and opportunities to be developed [1]. Sangkuriang catfish (*Clarias gariepsinus*) has the potential to become raw material for surimi, considering that the raw material for surimi from seawater fish has begun to decrease [2]. Fish protein is very special because it functions as an addition to the amount of protein consumed and as a complement to the quality of protein in the menu, including omega-3 fatty acids, carnitine, selenium, vitamin D, taurine and iodine [3].

Surimi is a semi-wet product (fish protein concentrate) produced by washing fish meat repeatedly to obtain salt-soluble protein in the form of myofibrils [4]. Washing fish meat aims to dissolve various water-soluble components, such as sarcoplasmic protein, blood, enzymes [5]. Surimi is used as a basic raw material in the manufacture of sausages, otak-otak, pempek, fish nuggets, fish balls [6]. The advantage of using surimi when compared to fresh fish is that it can maintain uniform quality, speed up processing and facilitate storage of raw materials [7].

Pempek is one of the foods made from vegetables and animals. Reference [8] stated that pempek is a typical food of Palembang, South Sumatra, which has been known since the days of the Sriwijaya kingdom until now. Pempek is made from a mixture of several basic ingredients such as fish meat (filet),

tapioca flour, water, salt and spices to enhance the taste [9,10]

Tapioca flour is often used as a raw material for making food, such as crackers, pempek, or often used as a substitute for wheat flour to process food ingredients [11]. The amylose content of tapioca flour is around 18.6-23.6% with a spherical granule shape and the starch gelatinization temperature reaches 62°C [12]. These characteristics are very suitable for use as raw materials for making crackers and pempek. Tapioca flour with high viscosity and does not experience retrogradation [13] will produce pempek with a stable texture when pempek is cooled. Tapioca flour is used in the food industry because of its starch content and nature which easily expands in hot water and can form the desired thickness [14]

The quality of the pempek produced is determined by the type and amount of fish and tapioca flour used [9]. The more fish added, the higher the pempek protein produced [15]. To obtain a good quality Pempek surimi catfish (*Clarias gariepsinus*) Sangkuriang catfish (*Clarias gariepsinus*) and liked by consumers, the process of making pempek must be considered, one of which is the ratio of surimi catfish Sangkuriang (*Clarias gariepsinus*) and tapioca flour to get pempek surimi catfish sangkuriang (*Clarias gariepsinus*) with good quality chemical and physical characteristics.

RESEARCH METHOD

Place and Time

This research was carried out in the laboratory of the Faculty of Agriculture, Muhammadiyah University of Palembang and the laboratory of Sriwijaya University Palembang from September 2018 to March 2019.

Materials and Tools

The materials used in this study were sangkuriang catfish (*Clarias gariepsinus*l), sucrose/granulated sugar, sodium triphosphate (STPP), salt, bulk ice, clean water, tapioca flour, and pempek lenjer for sensory testing.

While the tools used are plastic basins, stainless steel knives, cutting boards, digital scales, filter cloth, fish grinding tools, filters, stirrers, thermometers, paper plates, and label paper for sensory tests.

Method

This study used an experimental method with a randomized block design (RBD) arranged in a non-factorial manner with one treatment of various formulations of Sangkuriang catfish surimi consisting of six factors and repeated four times. The treatment used in this study is as follows:

L_1 = Surimi 0.25 parts and tapioca flour 1.00 parts.

L_2 = Surimi 0.50 parts and tapioca flour 1.00 parts.

L_3 = Surimi 0.75 parts and tapioca flour 1.00 parts.

L_4 = Surimi 1.00 parts and tapioca flour 1.00 parts.

L_5 = Surimi 1.25 parts and tapioca flour 1.00 parts.

L_6 = Surimi 1.50 parts and tapioca flour 1.00 parts.

RESULTS AND DISCUSSION

Color

Based on the results of the Conover test, the L_1 treatment was significantly different from the L_3, L_2, L_4, L_5 and L_6 treatments. The L_3 treatment was not significantly different from the L_2, L_4, L_5 and L_6 treatments. The L_2 treatment was not significantly different from the L_4, L_5 and L_6 treatments. The L_4 treatment was not significantly different from the L_5 and L_6 treatments and the L_5 treatment was not significantly different from the L_6 treatment.

The highest preference value for the color of pempek made from sangkuriang catfish surimi was found in the L_1 treatment (0.25 parts of sangkuriang catfish surimi and 1.00 parts of tapioca flour) with a clean white pempek color typical of fish pempek with an average value of 4.30 (panelists preferred criteria) and lowest in treatment L_6 (1.50 parts sangkuriang catfish surimi and 1.00 parts tapioca flour) with a slightly cloudy white color with an average value of 3.55 (panelists preferred criteria).

L_1 treatment with the lowest surimi ratio resulted in the largest value for the color of the pempek produced. Protein derived from sangkuriang catfish surimi can affect the intensity of the white color in the resulting pempek. Reducing the amount of surimi used can reduce the amount of myoglobin in the material and produce fish pempek with a whiter color in the L_1 treatment, so that the L_1 treatment produces a color that is preferred by the panelists compared to other treatments.

Tapioca flour as a raw material for making pempek can also affect the color of the resulting pempek. The use of a larger amount than the other treatments resulted in a whiter pempek color in the L_1 treatment than the other treatments. Other treatments with a higher ratio of surimi (treatments L_2, L_3, L_4, L_5 and L_6) will decrease the white color intensity due to an increase in the amount of myoglobin protein in the material and this can reduce the value of the panelist's preference level for the resulting pempek color.

White fish meat has a low myoglobin content resulting in a brighter product color. Meanwhile, the color of red fish meat is due to the fact that the meat contains high myoglobin which dominates the color of the product, making it darker or not lighter[16]. According to the reference [17], the nutritional composition of starch in tapioca flour can function to reduce textural damage and be used as a white coloring agent in pempek. Different types of fish produce different colors of pempek.

Aroma

Based on the results of the Conover test, the L_6 treatment was significantly different from the L_5, L_4 and L_3, L_2 and L_1 treatments. The L_5 treatment was not significantly different from the L_4 and L_3 treatments, but significantly different from the L_2 and L_1 treatments. The L_4 treatment was not significantly different from the L_3 and L_2 treatments, but significantly different from the L_1 treatment. The L_3 treatment was not significantly different from the L_2 treatment, but significantly different from the L_1 treatment and the L_2 treatment was significantly different from L_1.

The highest preference value for the aroma of pempek made from sangkuriang catfish surimi was found in treatment L_6 (1.50 parts of sangkuriang catfish surimi and 1.00 parts of tapioca flour) with a distinctive aroma of fish pempek with an average value of 4.30 (preferred criteria panelists) and the lowest was in the L_1 treatment (0.25 parts sangkuriang catfish surimi and 1.00 parts tapioca flour) with a distinctive aroma of tapioca flour which was more dominant with an average value of 3.15 (panelists preferred criteria).

The L_6 treatment with the highest surimi ratio resulted in the greatest value for the aroma of the

pempek produced. An increase in the amount of surimi can increase the fat content of the ingredients and during the processing the fat will interact with other ingredients (salt, carbohydrates and protein) to produce a distinctive aroma of fresh water fish pempek which is not fishy in the L_6 treatment, so that the L_6 treatment produces a preferred aroma the panelists compared to other treatments.

Another treatment with a lower surimi ratio (treatments L_1, L_2, L_3, L_4 and L_5) would decrease the intensity of the typical pempek aroma of freshwater fish and be replaced with the typical aroma of tapioca starch which could reduce the panelist's preference level for the aroma of the resulting pempek.

Differences in the type and composition of fat cause differences in the flavor of meat from different animals when the meat is cooked [18]. Types of freshwater fish with a low fat content have a lower fishy aroma character than seawater fish species which have a relatively higher fat content and a higher fishy aroma.[19].

In addition, the addition of spices can also improve the unwanted aroma of a food ingredient. The emergence of aroma in cooked meat is caused by the breakdown of amino acids and fats [20].

Taste

Based on the results of the Conover test, the L_6 treatment was not significantly different from the L_5, L_4 and L_3 treatments, but significantly different from the L_2 and L_1 treatments. The L_5 treatment was not significantly different from the L_4, L_3 and L_2 treatments, but significantly different from the L_1 treatment. The L_4 treatment was not significantly different from the L_3 and L_2 treatments, but significantly different from the L_1 treatment. The L_3 treatment was not significantly different from the L_2 and L_1 treatments and the L_2 treatment was not significantly different from L_1.

The highest level of preference for the taste of pempek made from sangkuriang catfish surimi was found in the L_6 treatment (1.50 parts of sangkuriang catfish surimi and 1.00 parts of tapioca flour) with a dominant pempek savory taste with an average value of 3.90 (panelists preferred the criteria) and the lowest was in the L_1 treatment (0.25 parts sangkuriang catfish surimi and 1.00 parts tapioca flour) with a distinctive taste of tapioca flour which was more dominant with an

average value of 3.15 (panelists preferred the criteria somewhat).

The L_6 treatment with the highest surimi ratio resulted in the greatest value for the resulting pempek flavor. An increase in the amount of surimi can increase the protein content of the ingredients and during the processing the protein will react with other ingredients (salt, carbohydrates and fat) to produce a savory taste that is dominantly typical of river fish pempek in the L_6 treatment, so that the L_6 treatment produces a taste that is preferred by the consumers. panelists compared to other treatments. Other treatments that use sangkuriang catfish surimi with a smaller ratio (treatments L_1, L_2, L_3, L_4 and L_5) will reduce the intensity of the savory taste typical of aquatic fish [21].

CONCLUSION

Based on the research that has been carried out, the following conclusions can be drawn: The highest preference level for the color of pempek made from sangkuriang catfish surimi was found in the L1 treatment (0.25 parts of sangkuriang catfish surimi and 1.00 parts of tapioca flour) with white pempek color typical clean fish pempek with an average value of 4.30 (panelists' preferred criteria).The highest level of preference for the taste and aroma of pempek made from sangkuriang catfish surimi was found in treatment L6 (1.50 parts of sangkuriang catfish surimi and 1.00 parts of tapioca flour) with a savory taste and dominant pempek aroma with an average value 3.90 (panelists preferred criteria) and 4.30 (panelists preferred criteria). Our suggestion is to use the L6 treatment (1.50 parts sangkuriang catfish surimi and 1.00 parts tapioca flour).

It is hoped that this can be an alternative raw material for making pempek, when the price of snakehead fish is expensive in the market, besides that it can increase food diversification.

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