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PEMPEK LENJER ORGANOLEPTICS FERMENTED SARDENE (*Sardina pilchardus*)

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ABSTRAK

Penelitian ini dilaksanakan untuk mengetahui organoleptik pempek lenjer ikan sarden yang difermentasi. Penelitian dilaksanakan di Laboratorium Fakultas Pertanian Universitas Muhammadiyah Palembang dan Laboratorium Fakultas Pertanian Universitas Sriwijaya Palembang pada bulan Oktober 2021 sampai bulan April 2022. Metode penelitian menggunakan rancangan acak kelompok (RAK) non Faktorial dengan faktor penelitian terdiri dari 4 tingkat P0 (tanpa fermentasi/kontrol), P1 (lama waktu fermentasi 12 jam), P2 (lama waktu fermentasi 24 jam), P3 (lama waktu fermentasi 36 jam) diulang 5 kali. Hasil uji F terhadap uji organoleptik dilanjutkan dengan uji tukey dan dunnet. Parameter pengamatan adalah uji organoleptik. Hasil penelitian menunjukan Uji organoleptik; rasa nilai 4,05; aroma dengan nilai tertinggi 4,10; dan warna nilai tertinggi 3,80. Dapat disimpulkan bahwa hasil uji organoleptik berbeda nyata dalam rasa dan aroma, sedangkan perbedaan warna tidak signifikan.

Kata Kunci: Ikon Makanan , Pempek Lenjer, Sardene, Fermentasi.

ABSTRACT

This research was conducted to determine the organoleptic of fermented sardine pempek lenjer. The research was conducted at the Laboratory of the Faculty of Agriculture, University of Muhammadiyah Palembang and the Laboratory of the Faculty of Agriculture, University of Sriwijaya Palembang from October 2021 to April 2022. The research method used a non-factorial randomized block design (RBD) with research factors consisting of 4 levels P0 (without fermentation/control), P1 (12 hours of fermentation time), P2 (24 hours of fermentation time), P3 (36 hours of fermentation time) were repeated 5 times. The results of the F test on the organoleptic test were followed by the tukey and dunnet tests. Parameter observation is organoleptic test. The results showed organoleptic

test; sense of value 4.05; aroma with the highest value 4.10; and the highest value color is 3.80. It can be concluded that pempek lenjer fermented sardines organoleptic test results are significantly different in taste and aroma, while the difference in color is not significant

Keywords: Food Icon, Pempek Lenjer, Sardines, Fermentation.

INTRODUCTION

Pempek is a culinary icon typical of South Sumatra [1], which is loved by the people of South Sumatra from children to adults. The basic ingredients for making pempek consist of ground fish, tapioca flour, salt and water [2]. Fish is a source of animal protein that humans need for growth, especially children. Fish protein has various advantages, including a complex amino acid composition, easy to digest and can be consumed by all age groups [3].

Fish is the main ingredient in making pempek, the concentration of fish and flour is 58% and 42% or equivalent to 350g of fish and 250g of tapioca flour. Apart from that, pempek can also be made with the formulation of a ratio of fish and tapioca flour 50:50 (50% fish and 50% tapioca flour) [4].

One of the fish that is widely consumed by Indonesian people in various processed forms is sardines (*Sardinella* sp.) [5]. The most common type of sardine in Indonesia is the lemuru fish (*Sardinella lemuru*) [6][7]. Lemuru fish contains high protein so it has great potential to be a source of protein [8]. This is very helpful for government programs in meeting the needs of the community's animal protein nationally [9]. Lemuru fish can be used as a raw material for processed food such as tekwan, pempek and crackers [10]. In addition, it can be an alternative for processing when fish stocks are abundant during the main harvest and increase the economic value of lemuru fish [11,12]

(Sardines are rich in omega-3, namely EPA (*eicosapentaenoic*) and DHA (*docohexanoic acid*). DHA is one of the unsaturated fatty acids, when combined with EPA it becomes vitamin F which functions to activate brain cells, an essential nutrient and a nutraceutical for brain health and diseases [13]. In addition, important for proper fetal development, including neuronal,

retinal, and immune function. EPA and DHA may affect many aspects of cardiovascular function including inflammation, peripheral artery disease, major coronary events, and anticoagulation [14].

Fermentation is a way to inhibit the decay process, improve taste and can increase nutritional value [15], especially in fish. Fermented fish undergo a process of biological or semi-biological decomposition of complex compounds [16], especially proteins, which are converted into simpler compounds under controlled conditions. Fermentation processing has several advantages including a simple, inexpensive and easy processing process [17]. In addition, fermentation can help in preserving and can increase economic value. Some of the advantages of fermented food are having a distinctive aroma, being a functional food because it produces bioactive compounds and is easily absorbed by the body

Fermentation can also cause physical and chemical changes in foodstuffs [18]. These changes resulted in improvements in nutritional aspects so as to facilitate the absorption of nutrients by the body, in addition to increasing the shelf life of fermented products. The nutritional quality of fermented raw materials will increase, this is due to the role of bacteria which can break down complex components in foodstuffs into simpler ingredients [19]. The superiority of fermented food is that it has a distinctive aroma, is easily absorbed by the body, and is a functional food because it produces bioactive compounds.

RESEARCH METHOD

This research was carried out from October to April 2022 which analyzed organoleptics at the Laboratory of the Faculty of Agriculture, University of Muhammadiyah Palembang and the Laboratory of the Faculty of Agriculture, University of Sriwijaya Palembang.

Materials and Tools

The materials used for this research were sardines (*Sardinella* sp.) obtained from the Palembang Jakabaring main market, salt, clean water and tapioca flour. While those used for chemical analysis were H_2SO_4,

NaOH, H_3BO_3, 0.5% phenolphthain indicator, ethanol, petroleum ether, hexane and distilled water and sardine fish lenjer pempek for organoleptic.

The tools used in this research were plastic basins, knives, cutting boards, jars, scales, fish grinders, stirrers. Meanwhile, for chemical analysis, the tools used were calipers, rulers, texture analyzers, spatulas, kjeldhal flasks, volumetric flasks, erlemeyers, electric stoves, dropping pipettes, measuring pipettes and burettes as well as tools for organoleptic tests including small plastic plates, label paper and sheets questionnaire.

Method

Our research used an experimental method with a randomized block design (RBD) arranged in a non-factorial manner with four treatments of fermented ground sardines consisting of one factor and repeated five times, with the level of factors used in this study, namely:

P0 = length of time fermentation 0 hours/Control

P1 = 12 hours of fermentation time

P2 = 24 hours of fermentation time

P3 = 36 hours of fermentation time

RESULTS AND DISCUSSION

Organoleptic Test

1. Flavor

Data from organoleptic test results for the effect of the length of time fermented sardines (P) on the taste of pempek lenjer, the results obtained had a very significant effect on the taste of pempek lenjer fermented sardines. Tukey's test results for the taste of fermented sardine pempek lenjer for each treatment can be seen in Table 1.

Tabel 1. Tukey Test Data of Fermentation Time on Pempek Lenjer Taste of Fermented Sardines

Treatment	Taste Average Rating	Comparison Between Samples	Tukey Test LSD = 0,38	Information
P3 (A)	4,05	A – B	0,25	tn
		A – C	0,80	*
		A – D	0,90	*
P2 (B)	3,80	B – C	0,55	*
		B – D	0,65	*
P1 (C)	3,25	C – D	0,10	tn
P0 (D)	3,15	–	–	

Information :
tn = Not Real Different
* = Real Different

The results of the Tukey test in Table 1 show that the P_3 treatment was not significantly different from the P_2 treatment, but significantly different from the P_1 and P_0 treatments. Treatment P_2 was significantly different from treatment P_1 and P_0 and treatment P_1 was not significantly different from treatment P_0. The highest level of preference for the taste of pempek lenjer fermented sardines was found in treatment P_3 (fermentation time 36 hours) with an average value of 4.05 (panelist preferred criteria) and the lowest level of preference was in treatment P_0 (without fermentation) with an average value average 3.15 (panelists preferred criteria).

The length of time of fermentation has a significant effect on the taste of pempek lenjer. During the fermentation process, proteins and fats will be catalyzed into simpler compounds in the form of amino acids and fatty acids [20], which can improve the taste of pempek lenjer made from fermented sardines. The use of 5% salt added as a fermentation substrate and the cooking process [21], also plays a role in the formation of the taste of fermented sardine pempek lenjer. Because the addition of salt in the

manufacture of pempek and the protein contained in the sardine meat and the boiling process causes the absorption of salt which functions to give flavor [22]

Proteolysis that occurs during the fermentation process causes peptides and amino acids to undergo various changes through deamination, decarboxylation and transamination reactions to produce ammonia, ketone acids, ammonia and carbon dioxide [23]. Meanwhile, lipids and phospholipids are further hydrolyzed to produce flavor components such as non-folicyl fatty acids and carbonyl compounds. According to paper [24] the degradation of fish protein into free amino acids is the cause of the formation of product flavors.

The addition of salt to the fermentation process of sardines aims to obtain certain (controlled) conditions so as to produce food products with certain characteristics. According to [18], that salt used in fermentation functions as a flavor enhancer, salt also plays a role in microbial selection. Proteolytic enzymes produced by halophilic bacteria will break down proteins into amino acids [25], especially glutamic acid which plays a role in the formation of savory flavors.

2. Aroma

Data from organoleptic test results for the effect of the length of time fermented sardines (P) on the aroma of pempek lenjer showed that the results had a very significant effect on the aroma of pempek lenjer fermented sardines. Tukey's test results for the aroma of fermented sardines in each treatment can be seen in Table 2.

Tabel 2. Tukey Test Data of Fermentation Time on Pempek Lenjer Aroma of Fermented Sardines.

Treatment	Aroma	Average Rating	Comparison Between Samples	Tukey Test LSD = 0,40	Information
P3 (A)	4,10		A – B	0,55	*
			A – C	0,70	*

		A – D	0,90	*
P2 (B)	3,55	B – C	0,15	tn
		B – D	0,35	tn
P1 (C)	3,40	C – D	0,20	tn
P0 (D)	3,20	–	–	-

Information :
tn = Not Real Different
* = Real Different

Data from organoleptic test results on the effect of length of time of fermentation of sardines (P) on the color of pempek lenjer, obtained from the results of treatment of length of time of fermentation had no significant effect on the color of pempek lenjer of fermented sardines and no further tests were carried out. The highest preference for the color of pempek lenjer fermented sardines was found in treatment P_3 (36 hours of fermentation time) with an average value of 3.80 and the lowest level of preference was in treatment P_0 (without fermentation) with an average value of 3.60 and all treatment included in the panelist's preferred criteria.

Color can determine the quality of a food ingredient because color appears first [31]. The color of a food product is the main attraction of the food before consumers know and like other properties. Only by looking at the color of food products, consumers can judge the quality of food ingredients quickly and easily [32].

The duration of the fermentation treatment did not affect the color [33] [34] of the fermented pempek lenjer of sardines, the highest level of preference for the color of the fermented pempek lenjer of sardines was highest in the P_3 treatment (36 hours of fermentation) with an average value of 3.80 (rather preferred by the panelists). The length of time of fermentation did not have a significant effect on the color of pempek lenjer.

During the fermentation process, the sardine meat will change color. Fresh sardine meat before fermenting reddish in color will lose its

reddish color and become slightly pale white with longer fermentation time.[33][35][36]. The formation of this color is due to the decomposition of the protein content (protein aggregation) by proteolytic bacteria so that the fish meat becomes denatured and the color of the fish meat becomes white rather pale.

CONCLUSION

Based on the research that has been carried out, it can be concluded that pempek lenjer fermented sardines organoleptic test results are significantly different in taste and aroma, while the difference in color is not significant. pempek lenjer in treatment P3 with an average of 4.05 for taste (panelists preferred criteria), 4.10 for aroma (panelists preferred criteria) and 3.80 for color (panelists preferred criteria).

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