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Mixture of Carrot Flour and Brokoli Flour on Acceptance and Nutrients of Nuggets Catfish

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Abstract

Making nuggets from catfish requires additional ingredients that act as fillers and binders in addition to herbs and spices, the filler commonly used is flour. Carrots and broccoli have a very distinctive aroma so that by processing them into flour the aroma of carrots and broccoli can be reduced. Both vegetables have a lot of nutrient content, one of the high nutrients in both vegetables is Vitamins A and C. The aims of this researsh was to determine the physical quality of catfish nuggets with the addition of broccoli flour carrot flour. The experimental design used in this study was a non-factorial Completely Randomized Design (CRD) with 3 treatments, namely the addition of carrot flour and broccoli flour with different amounts. Based on the results of the variance, it was found that the color with the highest average value was 3.82, for taste with an average value of 3.60, for aroma with an average value of 3.88, for texture with an average value of 3.83. in the chemical test with an average value of 2.13. Catfish nuggets with the addition of carrot and broccoli flour had a significant effect on the color, aroma, and texture of catfish nuggets. It is hoped that further research will be carried out on catfish nuggets using the same temperature in each treatment, and it is hoped that when frying catfish nuggets the oil used is replaced in each treatment, which may affect the organoleptic test of catfish.
Keywords: Acceptance, catfish nuggets, broccoli flour, carrot flour

Introduction

Handling nutrition problems is closely related to a nation's strategy in creating healthy, intelligent, and productive human resources. Efforts to improve quality human resources begin with handling children's growth as part of a family with good nutrition and care. The most nutritional problem in Indonesia is malnutrition. Children under five years old (0-5 years) are the age group that most often suffers from malnutrition or is one of the groups of people who are vulnerable to nutrition. In developing countries, children aged 0-5 years are the most vulnerable to nutrition. Children usually suffer from various infections and are in low nutritional status (Hartono, 2016).

Nuggets are a form of ready-to-eat frozen food products, namely products that have been heated to half-cooked (precooked), then frozen. This frozen ready-to-eat product only requires frying time for 1 minute at 150^{o}C. Catfish nuggets are a new product. Making nuggets from catfish requires additional ingredients that act as fillers and binders in addition to herbs and spices, the commonly used filler material is flour (Tumion & Hastuti, 2017).

Carrots (Daucus carota Linneus) are well-known as a vegetable source of provitamin A because of their high -carotene. Carrots are also a good source of minerals and fiber. Dietary fiber is recognized to have a positive effect on nutrient metabolism and body health (Sibrani, 2018). So

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far, carrots have not been used optimally, carrots are only used in vegetable processing such as soup, ointment, and others. Carrots are loaded with total carotene, beta carotene and water. Beta carotene in the body will be converted into vitamin A, a nutrient that is important for retinal function (Carvalho, 2019). The nutritional content of carrots in every 100 grams, including energy 42 calories, carbohydrates 9.3 grams, protein 1.2 grams, fat 0.3 grams, calcium 39 mg, phosphorus 37 mg, vitamin A 12,000 S.I, vitamin B1 0, 06 mg, vitamin C 6 mg (Carvalho, 2019).

Broccoli (Brassica oleracea L.) is a type of vegetable that belongs to the cabbage family (Brassicaceae). Broccoli is often referred to as a "super vegetable" because it has a high nutritional or nutritional content, namely it contains folate, vitamin C, vitamin K, iron, and is high in potassium (potassium), and contains antioxidant compounds (Widiwurjani, 2019). Broccoli contains calcium which can nourish bones during childhood because it contains sulforaphane, a compound that has a role in preventing the production of enzymes that can cause bone damage in the body (Niasti lasmi zaen, Nila hayati, 2020).

The nutritional content in broccoli is high enough to improve body health, such as vitamin A, vitamin C, and several minerals, namely thiamin, niacin, calcium and iron. In addition, broccoli also has a fairly high crude fiber, reaching 0.50 g and vitamin A is quite large at 210.00 RE (Dondoe, 2017). Broccoli contains vitamin C 100 mg per 100 grams of fresh broccoli. High levels of vitamin C indicate that broccoli can be a good source of vitamin C and has good antioxidant activity and contains 800 mg of chlorophyll per 100 grams of fresh broccoli as a flavonoid in broccoli (Anggraini, 2019).

Carrots and broccoli have a very distinctive aroma so that by processing them into flour the aroma of carrots and broccoli can be reduced. In addition, making carrots and broccoli into flour can extend the shelf life of the two vegetables (Utami et al, 2018). The addition of broccoli flour carrot flour to catfish nuggets is due to the fact that many people do not like the two vegetables, while the two vegetables contain a lot of nutrients, one of which is the substance. High nutrition in both vegetables, namely Vitamins A and C. Broccoli also contains calcium which can nourish bones during a child's growth period. In addition, carrots and broccoli are also easily available in the market and have a low price. Therefore, the researchers conducted a study on "Mixture of Carrot Flour and Broccoli Flour on Acceptance and Nutrients of Catfish Nugget". This research is one way to increase the nutritional content of nuggets with a variation of carrot flour. Broccoli flour.

Methods

This research is experimental to see the effect of "Adding a Mixture of Carrot Flour Broccoli Flour in Making Catfish Nuggets". The experimental design used in this study was a non-factorial Completely Randomized Design (CRD) with 3 treatments, namely the addition of different amounts of carrot flour and broccoli flour. The organoleptic analysis research was conducted at the Food Laboratory, Department of Nutrition, Poltekkes, Ministry of Health, Aceh and consisted of two parts, namely the preliminary test and the main research. Preliminary tests were carried out in August 2021 and the main research was carried out in May 2022. Analysis of the chemical fiber test was carried out at the Laboratory of the Faculty of Agriculture, Syiahkuala University in May 2022.

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Results

Organoleptic Characteristics

Acceptability of catfish nuggets with the addition of a mixture of carrot and broccoli flour was assessed using an organoleptic test and using a hedonic scale to determine the extent to which the panelists' preference for catfish nuggets with the addition of carrot flour and broccoli produced differs in color, taste, aroma, and texture.

Assessment of taste is done by tasting, color is assessed by seeing using the sense of sight, aroma is assessed by the sense of smell while texture is assessed by massaging and chewing the sample presented. From the research results catfish nuggets with the addition of carrot flour and broccoli can be seen to have a significant effect on color, taste, aroma, and texture.

Acceptance Test

Based on the acceptance test conducted by panelists on catfish nuggets with the addition of carrot and broccoli flour on color, taste, aroma, and texture.

Table 1. Average acceptance test of catfish nuggets

Formula	Color	Flavor	Scent	Texture	Average
20 gr carrot and broccoli flour	3.82 [c]	3.60 [a]	3.88 [b]	3.83 [b]	3.78
30 gr carrot and broccoli flour	3,44 [b]	3.45 [a]	3.60 [b]	3.64 [b]	3.53
40 gr carrot and broccoli flour	3,00 [a]	3.22 [a]	3.12 [a]	3.31 [a]	3.16

Color

Based on the organoleptic test on color with the addition of carrot and broccoli flour treatments, each treatment had different colors. Color differences in catfish nuggets were influenced by the addition of different amounts of tapioca flour and carrot and broccoli flour in each formulation. Where the average value of the color test produced on catfish nuggets with the addition of 20 g of carrot and broccoli flour has a high value of 3.82 (somewhat like). ANOVA analysis showed that catfish nuggets with the addition of carrot and broccoli flour had a significant effect on the color of catfish nuggets. The results of analysis of variance of catfish nuggets with the addition of carrot and broccoli flour with a calculated F value of 14,054 with a significant level (P value) of 0.004 < from 0.05 so it can be concluded that the treatment of catfish nuggets with the addition of carrot and broccoli flour has a significant effect on the color of the nuggets.

Taste

Based on the organoleptic test on taste, the addition of carrot and broccoli flour to catfish nuggets had a slightly different taste in each formulation. The average value of the organoleptic test obtained did not differ much between the 3 treatments with the average value ranging from 3.22 to 3.60. in the treatment of catfish nuggets with the addition of 40 g of carrot flour and broccoli, the panelists gave a response of 3.22 (somewhat like), the treatment of catfish nuggets with the addition of 30 g of carrot flour and broccoli gave a somewhat favorable response (3.45), and on the treatment of catfish nuggets 20 g carrot flour and broccoli gave a moderate response (3.60).

Aroma

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Based on the organoleptic test of the aroma, each treatment had the same aroma, namely the distinctive aroma of catfish, but the more carrot flour and broccoli were added, the less catfish aroma was. The average results of the organoleptic test did not differ much between the 3 treatments. The average value ranges from 3.12 to 3.88. And from 3 treatments with 3 repetitions, it is known that the highest value was found in the treatment of catfish nuggets with the addition of 20 g of carrot and broccoli flour with an average value given by the panelists of 3.88.

Texture

Based on the organoleptic test on texture with the addition of carrot and broccoli flour on catfish nuggets, it was found that the texture produced in the treatment of catfish nuggets was dense, chewy, and cracked. In the treatment of catfish nuggets with the addition of 40 grams of carrot flour and broccoli gave a response of 3.31 (somewhat like), the treatment of catfish nuggets with the addition of 30 grams of carrot flour and broccoli gave a response of 3.64 (somewhat like), and the treatment of catfish nuggets with the addition of carrot flour and broccoli gave a response of 3.83 (somewhat like). It can be concluded that the panelists gave the highest average value on the texture of catfish nuggets with the addition of 20 g of carrot and broccoli flour.

Nutritional Value (fiber)

Based on Nutritional Value (fiber) catfish nuggets with the addition of carrot and broccoli flour has increased on fiber content. Based on the results of Duncan's analysis, the treatment notation of catfish nuggets with the addition of 30 g and 40 g of carrot and broccoli flour was the highest in fiber content.

Table 2. Nutritional Value (fiber)

Formula	Fiber
20 gr carrot and broccoli flour	1.64 a
30 gr carrot and broccoli flour	2.01 b
40 gr carrot and broccoli flour	2.13 b

Discussion

Color

Color is a very important attribute in determining the acceptance of a food ingredient because color assessment is often used as a person's initial perception to determine the quality of a food product (Noviyanti, dkk, 2016). An ingredient that is considered nutritious, delicious, and has a very good texture will not be eaten if it has an unsightly color or gives the impression that it has deviated from its proper color. Attractive and natural-looking food colors can enhance taste (Awaludin et al., 2019).

Taste

Based on the analysis of variance on the taste of catfish nuggets with the addition of carrot and broccoli flour with a calculated F value of 1.939 with a significant level (P value) of 0.149 > from 0.05 so it can be concluded that the treatment of catfish nuggets with the addition of carrot and broccoli flour had no significant effect on resulting catfish nuggets.

Aroma

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Based on the results of analysis of variance showed that the treatment of catfish nuggets had a significant effect on the aroma with F count 9.396 with a significant level (P value) of 0.001 < 0.05 so it can be concluded that the treatment of catfish nuggets had a significant effect on the aroma of the catfish nuggets produced. Aroma is the most important thing in a product to know the quality of the product without tasting it because aroma is a fragrant smell that comes from plants or roots or food or beverage fragrance ingredients (Ela, 2020).

Texture

Based on analysis of variance, it was shown that the treatment of catfish nuggets with the addition of carrot and broccoli flour had a significant effect on the texture of catfish nuggets with a count of F 5.026 with a significant tarad (P value) 0.008 > 0.05. so it can be concluded that the treatment with the addition of 20 g, 30 g, 40 g of carrot flour and broccoli had a significant effect on the texture of the catfish nuggets produced (Sakti, 2018). Texture is the size and arrangement of (tissue) parts of an object or food. Textures can be seen directly using the sense of sight, namely hard, soft, smooth, rough, intact, solid, liquid, dry, moist, tough, crunchy, soft, and chewy (Ela, 2020).

Nutritional Value (*Fiber)*

Based on the results of the ANOVA test, the calculated F value is 5.786 with a p value of 0.040. This shows that there is a significant effect between the treatment of catfish nuggets on fiber content because the p value < 0.05. Average consumption of dietary fiber in Indonesia is 10.5 g per day (Putri, 2017). Furthermore, it is explained that the recommended dietary fiber requirement is 25-30 grams per day or 6-15 grams of crude fiber per day. This figure shows that the Indonesian population has only met their fiber needs about a third of the ideal requirement of 30 grams per day. Fiber can be added to cooking meat juices to add to the food product due to its water and fat retention properties. In fried foods, the addition of fiber reduces the lipid concentration and increases the moisture content.

Conclusion

it was found that the color with the highest average value was 3.82, for taste with an average value of 3.60, for aroma with an average value of 3.88, for texture with an average value of 3.83. in the chemical test with an average value of 2.13. Catfish nuggets with the addition of carrot and broccoli flour had a significant effect on the color, aroma, and texture of catfish nuggets. It is hoped that further research will be carried out on catfish nuggets using the same temperature in each treatment, and it is hoped that when frying catfish nuggets the oil used is replaced in each treatment, which may affect the organoleptic test of catfish.

References

Anggraini, T. (2019). Penggunaan Metode Reverse Spherification Pada Pembuatan Ravioli Sari Brokoli (Brassica Olaracea L.var Italica) Dengan Penambahan Konsentrasi I Xanthan Gum (C35H49O29) dan Konsentrasi Kalsium Klorida (CaCl2). Teknologi Pangan, 1(1), 41–57.

Awaludin, E., Sakung, J., & Baculu, E. P. H. (2019). Analisis Kandungan Zat Gizi Makro Dan Uji Organoleptik Brownies Kukus Berbasis Labu Siam. Jurnal Kolaboratif, 1, 649–663. https://jurnal.unismuhpalu.ac.id/index.php/jom/article/viewFile/872/675

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Carvalho, E. M. L. De. (2019). Substitusi Tepung Wortel (Daucus corota L) Terhadap Sifat Organoleptik Donat. Karya Tulis Ilmiah, 1–55.

Dondoe, R. H. U. (2017). Penambahan Brokoli Organik Pada Pengolahan Sosis Ikan Barakuda (Sphyreana Barracuda) Untuk Meningkatkan Kandungan Serat Dan Pro Vitamin A Proses Pengolahan Sosis Ikan Barakuda dengan Penambahan Brokoli Organik. 50–59.

Ela, S. (2020). Uji Organoleptik Nugget Ayam dengan Penembahan Tepung Wortel (Daucus carota L.). http://repositori.uin-alauddin.ac.id/ id/eprint/ 17441

Hartono, S.Gz, M. G. (2016). status gizi balita dan interaksinya. In Mediakom Edisi 76 Hal 46-49. https://sehatnegeriku.kemkes.go.id/baca/blog/20170216/ 0519737/status-gizi-balita-dan-interaksinya/

Niasti lasmi zaen, Nila hayati, dewi ramadani buulolo. (2020). Nugget Ikan Teri, Belut dan Brokoli (Libertri): Makanan Nikmat Untuk Balita. yayasan kita menulis. kitamenulis.id

Putri, M. F. (2017). Pemanfaatan Tepung Ampas Kelapa sebagai Sumber Serat Pangan dan Aplikasinya pada Nugget Jamur Tiram. JKKP (Jurnal Kesejahteraan Keluarga Dan Pendidikan), 4(02), 77–85. https://doi.org/ 10.21009/jkkp.042.0

Sibarani, E. M. (2018). Universitas Sumatera Utara Skripsi. Analisis Kesadahan Total Dan Alkalinitas Pada Air Bersih Sumur Bor Dengan Metode Titrimetri Di PT Sucofindo Daerah Provinsi Sumatera Utara, 44–48.

Tumion, F. F., & Hastuti, N. D. (2017). Pembuatan Nugget Ikan Lele (Clarias Sp) Dengan Variasi Penambahan Tepung Terigu. Agromix, 8(1), 25–35. https://doi.org/10.35891/agx.v8i1.562

Utami, S. S., Guntoro, G., Suharianto, S., & Umami, M. R. (2018). Sifat Fisik dan Sensori Nugget Wortel Brokoli. Prosiding, 215–220. https://publikasi.polije.ac.id/index.php/prosiding/article/view/1229

Widiwurjani, G. dan P. A. (2019). Status Kandungan Ssulforaphane Microgreens Tanaman Brokoli (Brassica oleracea L.) Pada Berbagai Media Tanaman Dengan Pemberian Air Kelapa Sebagai Nutrisi. Jurnal Ilmiah Hijau Cendekia, 4, 38. http://ejournal.uniska-kediri.ac.id/index.php/HijauCendekia