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Organoleptic Study of Dumbo Catfish Sausage (*Clarias Gariepinus*) With Carrot (*Daucus Carota,L*) And Mocaf Flour Substitution

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ABSTRACT

African catfish is an easy fish cultivated, no requires large capital as well as its growth fast, unfortunately consume catfish in form processed Still limited so that need processed become sausage. Sausages that use material 100 % raw catfish meat produce lacking product well, that is colored white grayish and has a rancid aroma so that not enough liked. For That need added carrot with objective increase quality color, minimizes rancid aroma and improves mark nutrition. Study This aim know level favorite panelist to Dumbo catfish sausage with substitution treatment carrots and Mocaf. Design study use Completely Randomized Design with 1 factor that is substitution Mocaf and carrots with comparison: P1 (Mocaf 5% carrot 35%), P2 (Mocaf 10% carrot 30%), P3 (Mocaf 15% carrot 25%) and P4 (Mocaf 20% carrot 20%) from heavy material catfish meat .Every treatment tested in a way organoleptic against 30 panelists covers texture, aroma, taste and color on a scale of 1-5. Collected data analyzed with analysis variance and if there is difference next with the BNT (Significant Difference) test Smallest) at level significance 5%. Research results show treatments P1, P2, and P3 did not different real and real preferred treatment panelist based on the parameters of texture (average score 3.94-4.23), aroma (average score 3.61-3.94), taste (average score 3.76-4.03) and color (average score 3.75-4.09).

Keywords : African catfish , mocaf , sausages , carrots

1. INTRODUCTION

African catfish is the most abundant type of catfish found in Indonesia. This thing Because African catfish cultivation is not requires large capital, land special, easy maintenance and growth more fast compared to catfish local (Rosalina, 2015). African catfish is also quite popular because price Affordable, I think savory, texture the meat soft and rough, way cooking and consuming his No troublesome (Martiana, 2015). According to (Nurimala et al., 2009) African catfish contains sufficient protein high (17.71%), whereas content the fat low (0.95%)

Consumption biggest catfish Still in fresh form , temporary consume catfish in form processed Still limited , aside That Still There is part society that has perception negative against catfish Because shape and color the skin black as well as slimy so that not enough preferred (Asriani et al., 2018). Efforts to overcome problem this is necessary done innovation new For take

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advantage potential and production of catfish, One opportunities that can be developed that is processing catfish become sausage.

Sausage is processed food made from meat that has been crushed until smooth, mixed with material filler, given spices, put in into the wrapping (sleeve). Common fillers used in manufacturing sausage is flour tapioca, cornstarch, ISP, and Mocaf . Filling materials used in research. This that is Mocaf (*Modified cassava flour*). Mocaf is flour cassava trees that have modified non - chemically with method fermentation. Mocaf own high starch namely 70.6% (Faridah & Bambang Widjanarko, 2014). Mocaf own excess that is ability For increase water holding capacity, increasing stability emulsify , and reduce smell fishy (Ariani Putri et al., 2018). Flour mocaf own different characteristics with flour cassava and tapioca as well as can substitute flour wheat (Arsyad, 2016).

Sausages that use material 100% raw African catfish meat, produce lacking product well, that is colored white grayish and has a typical catfish aroma (rancid) so not enough liked consumer (Martiana, 2015). Possible alternative done For overcome matter This is with add A purposeful carrot increase quality color, minimizes rancid aroma typical catfish and improve mark nutrition sausage.

Carrots (*Daucus carota,L*) are type lots of vegetables contains ß- Carotene . In the body, ß- Carotene changed into vitamin A. ß- Carotene in carrot besides can fulfil vitamin A requirements, also works as antioxidant in reduce effect radical free (Agustina et al, 2019). Carrots can reduce elasticity of the product food, increasingly tall use carrot will the more product is hard too the food as well as can improve the taste of preparations food (Devi Ariyana et al., 2018).

Results of research carried out previously by Anggraini et al. (2016) about quality sausage catfish with variation type and concentration material filler show that type material preferred filler is mocaf 5 % with mark favorite to color 64%, taste 76%, texture 64%, aroma 40%, and overall parameters (color, taste, texture and aroma) 68%. Whereas results research conducted by (Martiana, 2015) on Dumbo catfish sausage with addition carrots (10%, 30%, and 50%) show that quality sausage The best (protein and calcium) were found in the treatment with addition carrot 10%, will but from testing in a way organoleptic Dumbo catfish sausage with addition carrots 30% constitute most preferred treatment consumer with percentage 80.7%.

Dotted reject the description on study This aim know favorite panelist to Dumbo catfish sausage with substitution carrots and flour mocaf . Substitution use carrots and mocaf expected can increase quality color and texture sausage, minimizing the rancid aroma typical catfish and

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improve mark nutrition sausage so that more liked by consumers.

2. RESEARCH METHOD

Research Tools and Materials

The research was carried out at Integrated Food Laboratory of The Agro-Industry Study Program, Vocational Faculty, Universitas 17 Agustus 1945 Surabaya in April-June 2023, including preliminary research (to determine the correct sausage formulation) and main research. Tool used: sausage filler, chooper, basin, knife, plate, penetrometer, sacles, gas stove and steamer pot. The main ingredients used ini the research were African catfish from sel-cultivation, sausage cassing, Ladang Lima stamp Mocaf flour obtained from the online shop, STTP from a cake ingredients shop, local fresh carrots from the market and additional seasonings (sugar, salt, shallots, garloc, cooking oil, and pepper) obtained from the local market.

Design and Procedures Study

Study make Dumbo catfish sausage with treatment substitution flour mocaf and carrots refers to research conducted by Anggraini et al (2016) and Martiana (2015) which has modified based on study preliminary work done writer. Substitution carrots and mocaf were used in each treatment are: P1 (Carrots 35% Mocaf 5%); P2 (Carrots 30% Mocaf 10%); P3 (Carrots 25% Mocaf 15%) and P4 (Carrots 20% Mocaf 20%). Formulation material in making African catfish sausage complete can seen in Table 1.

Table 1. Formulation Sausage on Each Treatment

Raw Material	Treatment 1 (P1)	Treatment 2 (P2)	Treatment 3 (P3)	Treatment 4 (P4)
Fish Catfish Dumbo	100 g	100 g	100 g	100 g
Carrot	35%	30%	25%	20%
Mocaf	5%	10%	15%	20%
Water Ice	30%	30%	30%	30%
STPP	0.9 g	0.9 g	0.9 g	0.9 g
Onion Red	0.6%	0.6%	0.6%	0.6%
Onion white	0.4%	0.4%	0.4%	0.4%
Pepper	0.15%	0.15%	0.15%	0.15%
Sugar	1.5%	1.5%	1.5%	1.5%
Salt	2%	2%	2%	2%
Oil Fry	10%	10%	10%	10%

Manufacturing process sausage started with clean carrots and catfish with clean running water.Catfish next on fillet then frozen in the freezer. Frozen carrots and fish fillets furthermore cut small and measured in accordance treatment Then mixed with flour mocaf, spices (sugar, salt,

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pepper, onion red, onion white) with size in accordance treatment. Mixture material furthermore grinded with Chooper. In the grinding process Add 30% ice water heavy Objective African catfish meat For maintain keep the temperature of the fish constant low during milling. Milling done for 3 minutes with speed medium (speed 4) while enter oil as much as 10% of weight of catfish in a way slowly. After that's it, dough entered to in sleeve sausage use sausage filler. Dough in sleeve made A little solid to produce visible sausage merges with the sleeve. Sausage furthermore cooked with method steamed at 80 °C for 30 minutes. After cooked, sausage cooled with Place in ice water to set sausage solid.

Collection and Analysis

Sausages that have been ripe then tested on 30 panelists with an organoleptic test (liking) on a scale of 1-5 which includes parameters of texture , aroma, taste and color with really like category (score 5), like (score 4), enough like (score 3), no like (score 2), really don't like (score 1). Organoleptic test results data furthermore analyzed with analysis variance (ANOVA). Favorite data panelist This Still is ordinal data, so before analyzed with analysis The variance of the data is transformed to interval data with use successive interval (MSI) method. If results analysis variance show exists difference real, then search more carry on done with different tests real smallest (BNT).

3. RESULTS AND DISCUSSION

Texture

Evaluation texture by panelists tested in a way subjective with method touching, folding, and biting sausage. Favorite test result data panelist to texture African catfish sausages are presented in Table 2

Table 2. Average Likeability Panelists to Texture Sausage

Treatment	Average	Standard Deviation
P1	4.2268 [a]	0.9087
P2	4.2270 [a]	0.9255
P3	3.9393 [a]	0.8936
P4	2.9396 [b]	0.9674

Description : Average value accompanied by different letters
state there is significant difference at the 5% level

Analysis results variance show that substitution carrots and mocaf influential real to

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texture sausage catfish on level significant 5%. Search more carry on done with the BNT test with results as can be seen in Table 2. Based on Table 2, it can be seen that P1, P2 and P 3 treatments are different real with P4 treatment at level significance 5%, where treatment P4 shows the lowest score (2.93) which means texture catfish sausage Enough liked by the panelists. This thing caused because in the P4 treatment carrots were used balanced with flour Mocaf (20% carrot and 20% mocaf) so texture sausage produced rather hard. In treatments P1, P2, and P3, statistics third treatment This No different real. This thing show that level favorite panelist on third treatment the You're welcome preferred by the panelists, ie is in range value 3.94 – 4.3. The causal factor is flour Mocaf in treatments 1, 2 and 3 did not too many (5%,10%, 15%) whereas carrot Enough much (35%, 30%, and 25%) so texture catfish sausage No hard (soft). This thing in accordance with study Martiana (2015) stated the more Lots giving carrot so texture sausage produced the more gentle so that the more liked by the panelists.

Softness texture This caused Karen Water content and β carotene in carrots more high. The same opinion was also expressed by (Faridah & Bambang Widjanarko, 2014) who states the more tall use carrot will the more product is soft too the food . Texture sausages are also affected by the use of MOCAF because content existing starch in it. According to(Singal et al., 2014), starch used chosen based on composition amylose and amylopectin. Amylose and amylopectin influence to the resulting texture. Content starch This causes a gel to form when heating (steaming) increasingly many and strong so that produce more texture hard (Wardani Marisa Kusuma et al., 2022). Mocaf own content amylose 25% and amylopectin 75% (Wardani Marisa Kusuma et al., 2022). The more tall percentage mocaf so ability starch binds more water difficult and impacts the texture more sausages hard. Content starch own ability absorb water due to own group hydroxyl.

Aroma

Aroma is Acceptance is very subjective as well as difficult measured, where every individual will have different and varying sensitivities and preferences.Food aroma will arise if emit easy compound evaporation released by the material food . Gas molecules in the air will inhaled by the senses smell so that touch cells sensitive smell (Martiana, 2015). Favorite test result data panelist to texture African catfish sausages are presented in Table 3.

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Table 3. Average Likeability Panelists to the Sausage Aroma

Treatment	Average	Standard Deviation
P1	3.7549 a	0.9381
P2	3.9396 a	0.9391
P3	3.6144 ab	0.9033
P4	3.2272 b	0.9356

Description : Average value accompanied by different letters
state there is significant difference at the 5% level

Analysis results variance show that substitution carrots and mocaf influential real to the aroma of catfish sausage at level significant 5%. Search more carry on done with the BNT test with results as can be seen in Table 3. Based on Table 3, it can be seen that P1 and P2 treatments are different real with P4 treatment at level significance 5%, where treatment P4 shows The lowest score (3.23) means the aroma of catfish sausage Enough liked by the panelists . This thing caused because in the P4 treatment the carrots and mocaf used each caused 20% reduced fish aroma due to covered by the sufficient aroma of MOCAF flour high (20%). This thing in accordance with research conducted by (Anggraini et al., 2016) who stated that type and concentration material filler (flour mocaf and cornstarch) have an effect to texture sausage produced .

In Table 3 it can also be seen that the sausage aroma produced in treatments P1, P2 and P 3 was not different real. This thing show that level favorite panelist on third treatment the is in range mark relatively The same (3.61 – 3.94) which means liked. The causal factor Because MOCAF percentage does not too many (5%, 10% and 15 %) while percentage carrot Enough high (35%, 30% and 25%) so that the aroma of fresh fish is more dominate.

The smell of catfish sausage in research This it smelled of fresh fish which didn't stings because of the aroma influenced by the aroma of catfish which is still fresh because taken from pool yourself, flour MOCAF, carrots , and other spices are added during making and cooking product . The smell of sausages in general affected by the reaction Maillard from material food processed That Alone (Trianto et al., 2014).

Flavor

Taste is response exists stimulation chemicals perceived by the senses taster tongue, esp basic taste type that is sweet7, salty , sour and bitter . A number of components that play a role in determining the taste of food are aroma, spices, ingredients food , tenderness , and level maturity (Devi Ariyana et al., 2018). Favorite test result data panelist on the taste of catfish sausage can seen

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in Table 4.

Table 4. Average Likeability Panelists on Sausage Taste

Treatment	Average	Standard Deviation
P1	3.9393 a	0.9356
P2	4.0267 a	0.9071
P3	3.7550 a	0.9522
P4	3.2271 b	0.9522

Description : Average value accompanied by different letters
state there is significant difference at the 5% level

Analysis results show that substitution carrots and mocaf very real effect to the taste of sausage catfish on level significant 5%. Search more carry on done with the BNT test with results as seen in Table 4. Based on Table 4, it can be seen that P1, P2 and P3 treatments are different real with P4 treatment at level significance 5%, where treatment P4 shows The lowest score (3.23) means the taste of catfish sausage Enough liked by the panelists . This thing caused because in treatment P4 use enough MOCAF flour high (20%) in comparison with other treatments, so that the sausage tastes become tasteless Because spices on sausages No tie more a lot. The sausage taste appears because exists Maillard reaction which influences the formation flavors and colors in a variety processed food That yourself. Reaction Maillard is reaction among reducing sugars with amino acids because effect from warming up. This is also appropriate with research conducted by (Anggraini et al., 2016)stated that type and concentration material filler (flour mocaf and cornstarch) have an effect on the taste of the sausage produced.

Based on Table 4, it can also be seen that the taste of sausages produced in treatments P1, P2, and P3 is consistent statistics No different real . This thing show that level favorite panelist on third treatment the is in range mark relatively The same (3.76 – 4.02) which means liked. The causal factor Because flour Mocaf No too Lots namely 5%, 10%, and 15% so that the spice and fish taste is sufficient dominant so that tend liked by the panelists.

Color

Color is evaluation panelist to product Where generally panelist tend choose product appearance more interesting and is visualization to something product that will seen moreover formerly compared with factors others, like texture, aroma, and taste (Singal et al., 2014). Average liking data panelist to color catfish sausage can seen in Table 5.

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Table 5. Average Likeability Panelists on Sausage Color

Treatment	Average	Standard Deviation
P1	4.0907 a	0.9080
P2	3.7548 a	0.9431
P3	3.9396 a	0.9296
P4	3.2271 b	0.9507

Description: Average value accompanied by different letters
state there is significant difference at the 5% level

Analysis results show that substitution carrots and mocaf very real effect to color sausage catfish on level significant 5%. Search more carry on done with the BNT test with results as can be seen in Table 5 which shows that there is difference real between treatment P 1, P 2, P3 with P4 treatment. P4 treatment, color sausage including in category rather preferred (3.23) while treatments P1, P2 and P3 included in category preferred (3.75 - 409). Treatment P4 amount Mocaf was given the most (20%) so not enough liked compared to other treatment because the color pale. This thing in accordance with study Trianto et al (2014), increasingly high % Mocaf given, then sausage the more pale. The causal factor Because rate amylopectin produces a transparent and rich gel amylose cause more color blurry and pale.

In Table 5 it is also seen color sausages in treatments P1, P2, and P3 respectively statistics No different real and liked by the panelists. The causal factor because of the treatment the given carrot Enough much (35%, 30% and 25 %) compared with amount Mocaf (5%, 10% and 15%) so sausage colored bright (orange). This thing caused Because exists content of β carotene which is a pigment that provides the orange color of carrots (Trianto et al., 2014)which can influence color sausage.

4. CONCLUSION

Favorite panelist to Dumbo catfish sausage with substitution carrots and mocaf in treatments P1, P2, and P3 did not different real on a level 5% significance for both texture, aroma, taste and parameters color. Score for texture 3.94-4.23 (Like); aroma 3.61-3.94 (like), taste 3.76-4.03 (like) and color 3.75-4.09 (like). P4 treatment is sufficient liked by the panelists, good for texture parameters (score 2.94), aroma (score 3.23), taste (score 3.23) or color (score 3.23). Study furthermore need done testing to mark nutrition in catfish sausage with substitution Mocaf and carrots and necessary studied in a way economical about appropriateness business catfish sausage.

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