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I, Sariningsih certify that I have participated sufficiently in the conception and designing of this work entitled “Level of Powder Flavors Raw Materials Liquid Waste Maltodextrin With Filler” and the analysis of the data, as well as writing of this manuscript, to take public responsibility for it.

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LEVEL OF POWDER FLAVORS RAW MATERIALS LIQUID WASTE MALTODEXTRIN WITH FILLER

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ABSTRACT

This research aims to determine the amount of filler maltodextrin right to produce powdered flavorings made from liquid waste of caramelized milk being most preferred. This research was conducted in December 2018 - February 2019 in the Laboratory of Fishery Products Processing Faculty of Fisheries and Marine Sciences, the Central Laboratory of the University of Padjadjaran, SMEs Pindang Sari in Banjar, West Java. Chemical analysis at the Laboratory of Food Technology Faculty of Engineering, University of Pasundan Bandung. The method used is an experimental, with 20 semi-trained panelists as replicates with 4 levels maltodextrin additional treatment was 0%, 12.5%, 15% and 17.5% (w / v). Parameters observed that the organoleptic characteristics (hedonic test) include color, aroma, texture, and flavor. Having obtained the hedonic test results, performed physical characteristics (yield and solubility), and the chemical characteristics (ash content, water, protein, fat and carbohydrate) to the powder flavor being most preferred. Data were analyzed using Friedman Test. The results of this research concluded that the powdered flavorings made from liquid waste of the most preferred boiled milk that is equal to 15% with a median value that is equal to 7 (color), 7 (aroma), 7 (texture), and 9 (taste). The addition amount of filler 15% (w / v) are most preferred by the panelists. The results of this research concluded that the powdered flavorings made from liquid waste of the most preferred boiled milk that is equal to 15% with a median value that is equal to 7 (color), 7 (aroma), 7 (texture), and 9 (taste). The addition amount of filler 15% (w / v) are most preferred by the panelists. The results of this research concluded that the powdered flavorings made from liquid waste of the most preferred boiled milk that is equal to 15% with a median value that is equal to 7 (color), 7 (aroma), 7 (texture), and 9 (taste). The addition amount of filler 15% (w / v) are most preferred by the panelists.

Keywords: condiment flavor of caramelized milk, liquid waste, maltodextrin, preference level

1. Introduction

Pemindangan fish is an effort to preserve fish processing at the same time using the technique of salting and boiling. The processing is done by boiling or by heating the fish in salt Susana within a certain time in a container. Containers used as a fish during boiling or heating and simultaneously used as packaging during transport and marketing (Budiman 2011). Pemindangan process in Small and Medium Enterprises Pindang Sari Banjar, West Java produces waste in the treatment process, the rest of the fish stew in liquid form. Domestic industry capable of producing boiled milkfish 50 karinjang / month, one milk ranges between 8-10 kg, and produce liquid waste fish boiling approximately 650 liters per month.

Waste fisheries, former pemindangan stew, usually directly discharged into rivers that can cause pollution and cause odors resulting from decomposition of protein (Nilawati et al 2014). Fish processing wastewater containing highly nutritious protein but has not been used optimally. The waste can cause problems in the environment if not done processing. Waste generated in the form of water-containing protein fishing industry 13.22%, 2.10% fat, 2.60% ash, bits of meat and other components lost during pemindangan (Isnaeni et al 2014).

Utilization of wastewater boiled milk is then made of product innovation to enhance the economic value is higher. One innovation that is powdered flavorings. Powdered flavorings that can be found in the market are powdered flavoring beef and chicken that have been packaged economically as powdered flavorings Royco, Masako, and Mamasuka (Millichap and Michelle 2003).

Powdered flavorings or instant powder into one of the alternative cooking very practical and time saving. Instant powder is a mixture of various herbs and spices are mixed and processed with a particular composition. Instant seasoning presented in packaging that has the functionality and usability for cooking according to the type of cooking (Hambali 2008).

Pembuaatan powdered flavorings such on the market using the principle of drying of liquid broth extract becomes dry and powdery. A critical factor in the manufacture of the product - flavoring powder products is influenced by fillers or thickeners functioning binding material content in the broth so that it becomes easily dried. Kinds of filler material that is often used is maltodextrin, twenn 80, gum arabic, wheat flour, tapioca flour and flour Maizen (Machbubatul 2008). The use of fillers in the manufacture of flavor aims to increase the total solids in solution (Ismiwarti 2005).

The filler used in this research is maltodextrin. Maltodextrin is best used as a filler to increase the volume in the food system. Generally, maltodextrin is used in a mixture of dry powder, snacks, products - bakery products, sweets, cheese, frozen foods, and sauces (Whistler and Miller 1999).

Selection of maltodextrin compared to other filler materials for the release of maltodextrin to protecting the nutritional components, protect important compounds such as antioxidant components due to the extreme temperatures. Maltodextrin has the ability to form the body and has a strong tie to the compound coated (Ramadhia et al, 2011).

Fastyka and Daughter (2014) states that the maltodextrin is enkapsulat material and has a strong tie to the compound coated. Dingding kapsulat such as maltodextrin may serve to protect the sensitive components such as antioxidant components, flavors, vitamins, color, and other nutritional components.

The addition of fillers such as maltodextrin if too little then powdered flavorings made from liquid waste will be quickly boiled milkfish brown when heated in the drying process and reduces the material's ability to clot. The addition of the filler is too high, it can reduce the flavor of the main raw material (Astawan 2002).

Therefore it is necessary to do research in order to determine the additional amount of maltodextrin filler material made from liquid waste boiled milkfish right to produce the powder flavoring liquid waste boiled milk being most preferred.

2. MATERIALS AND METHODS

2.1 materials Used

Equipment used in the manufacture of powdered flavorings namely basins, mixers, knives, cutting boards, scales, measuring cups, blender, basin, mixer, stove, frying pan, and spray dryer.

2.2 Research Methods

The method used in this research is the experimental method, which consists of 4 levels of treatment and 20 replications performed by semi-trained panelists. Four levels of treatment in addition to the filler maltodextrin boiled milkfish effluent is as follows:

1. Treatment A: 0% maltodextrin by weight of the liquid broth (w / v)
2. Treatment B: 12.5% by weight maltodextrin liquid broth (w / v)
3. Treatment C: 15% maltodextrin by weight of the liquid broth (w / v)
4. Treatment D: 17.5% maltodextrin by weight of the liquid broth (w / v)

The percentage increase calculated from the amount of maltodextrin main ingredient forming flavoring boiled milk powder and other ingredients. The formulation used in this research are as follows:

Table 1. Composition of Raw Materials Flavoring Extract Powder

material	Treatment Addition of Maltodextrin			
	0%	12.5%	15%	17.5%
Liquid Waste Pindang milkfish (mL)	1500	1500	1500	1500
Maltodextrin (g)	0	187.5	225	262
Shallots (g)	30	30	30	30
Garlic (g)	30	30	30	30
Pepper (g)	1.5	1.5	1.5	1.5
Turmeric (g)	7.5	7.5	7.5	7.5

Source: Modification Arnesih (2018)

Manufacture of caramelized milk powder flavoring guided by research Arnesih (2018) with some modifications. The procedure of making powdered milk flavoring boiled as follows: 1.5 liters coming from SMEs Pindang Sari Banjar, West Java at the boil for 5 minutes with a temperature of 80 ° C 100 ° C and then after that added seasonings - spices such as onion, garlic, pepper and turmeric that has been smoothed beforehand using a blender. Onion, garlic, pepper, turmeric and waste water input into the boiled milk in a pan and then boiled for 5 minutes at a temperature of 80 -100 ° C. Broth stew broth then filtered through a sieve (filtrate) clear to wear the next stage. The broth filtrate that is filtered, added fillers how maltodextrin accordance with the treatment (0%, 12.5%, 15%, 17, 5%) and stirred until dissolved. Drying using a spray dryer with a dryer inlet temperature of 170oC and an outlet temperature of 80 ° C with a drying time for 1.5 hours. Powdered flavorings then packed with plastic ziplock

2.3 Observe Parameters

The parameters observed in this research is the organoleptic characteristics (color, aroma, texture, and flavor).

2.4. Data Analysis

The test data obtained in the form of the hedonic test data (A) on color, aroma, texture and flavor will be analyzed by Friedman test. Data will be analyzed by non-parametric statistics. Physical analysis that the yield and the solubility and chemical analysis covering the ash content, water, protein, fat, and carbohydrates comparatively analyzed descriptively.

Non-parametric statistical analysis conducted for organoleptic testing using Friedman two-way analysis of variance with the Chi-square test (Sudrajat 1999). Friedman purpose is to see whether or not a difference between the effects of treatment. Statistics formula used in the Friedman test are as follows:

$$XR2 = \frac{12}{nk\,(k+1)} \sum_{J=1}^{k} (Rj)^2 - 3\,n\,(k+1)$$

Information:

xr^2 = Statistics Test *Friedman*
n = Deuteronomy
k = treatment
Rj = Total ranking of each treatment

If the research data shows the same figures then be calculated correction factor (FK) using the following formula:

$$FK = 1 - \frac{\sum T}{nk\,(k-1)}$$

$$Hc = \frac{x^2}{FK}$$

Information:

T = N (t^3-t)
ti = Number of observations of the same value for a given rating.
N = Number of observed values are equal to a rank with the same value of t.

Significant value Hc observation price can be determined by using the table prices are critical Chi-squared with db = k-1; = 0.05.

Rule the decision to test the hypothesis that:

H0 = The treatment does not give a noticeable difference in the level ofα = 0.05
H1 =The treatment gives a noticeable difference in the level of α = 0.05

If the price of Hc <x2α (K-1), then accept H0 and reject H1, and if the price of Hc> x2α (K-1), then H0 rejected and H1 accepted. When H1 is received, then the treatment gives a real difference and the test continued to determine the median value are not the same and to know the difference between treatments with the testMultiple comparisons (multiple comparison) with the following formula (Sudrajat 1999):

$$|Ri - Rj| \leq Z\{\propto/k(K-1)\}\sqrt{bk(k+1)/6}$$

Information:

$|Ri - Rj|$ = Change in average rankings.
Ri = The average ranking of the sample to-1
Rj = The average ranking of the samples to j
α = Experiment *wise error*,
b = Number of data or replay.
k = Number of treatment.
Z = The value on the Z table for *multiple Comparison*

Furthermore, to determine the best treatment method used *Bayes*, Bayes method is one technique that can be used to perform the analysis in the decision making the best of a number of alternatives with the aim of producing the acquisition considering various criteria(Marimin 2004), To get the best treatment then analyzed using Bayes test.

The Bayes equation as follows:

$$Total\ nilai_i = \sum_{i-1}^{m} Nilai_{ij}\ (Krit_j)$$

Information:

total nilaii : Total final value of alternative to - i
Nilaiij : Value alternative to - I in the criteria to - j
Kritj : The level of importance (weight) criteria to - j
i : 1, 2, 3, ... n; n = number of alternatives
j : 1, 2, 3, ... n; n = number of criteria

The steps in determining the best treatment method *Bayes*, as follows:

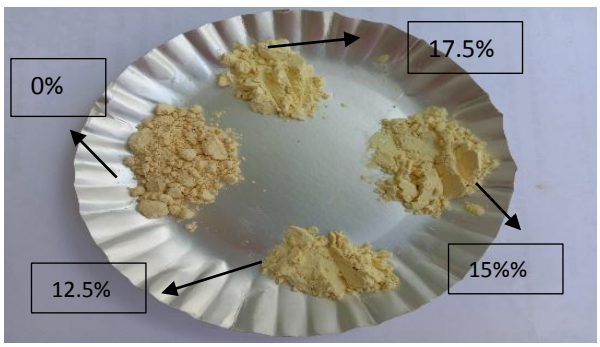
1) Determine the comparative matrix squid ink with cornstarch based criteria are observed from the data two questionnaires based on the criteria of color, aroma, texture and flavor intensity of products tortilla chips squid ink most panelists favored. The value of their respective interests organoleptic parameters used consisted of 5 numeric values, namely 1 second equally important element, 3 represents a little more important, representing more important 5, 7 represent a clear element is more important and 9 represent very important. The value of the benefit can be obtained from the questionnaire panelists.
2) Merging data every criteria by using the average geometry formula is:
   xg = $\sqrt[n]{\pi}.xi$
   Information: X_g = Average Geometric
   π = Permutations
   n = Number of Panelists
   xi= The assessment by panelists to-i

   Thus the priority value can be obtained on each criterion of the average data from the geometry of each criterion.
3) Calculation using Bayesian methods. Normality value / weight criterion obtained is multiplied by the median value of organoleptic test results in each treatment criteria then summed to obtain a value alternative.
4) The results were then discussed descriptively.

3. RESULT

3.1 Level Color passions

Color is the first characteristic that is rated panelists in consuming a product. Parameters were first observed by consumers that is the color for a parameter that determines acceptance of panelists (Soekarno1985).



Gusman (2013) states that the product that has an attractive color definitely more preferred by consumers when compared to products that have a color that is less attractive. It makes the color characteristics become one of the important parameters in determining consumer appeal.

Figure 1. Color powder flavor of caramelized milk according to treatment

Friedman test results on color preference level of caramelized milk flavoring powder showed that the addition of maltodextrin does not significantly affect the level of preference of color powder boiled milk flavor. Be produced uniform median value is 7 (preferred), which means the product is preferred by the panelists.

Color powder flavor of caramelized milk tend to be uniform is yellowish white. This happens because maltodextrin alone has the characteristic white color, so that when it is added as a flavoring powder filler material preserved banding does not result in differences in visual product. Comparison of color of each treatment can be seen in Figure 4. Color powder flavor of caramelized milk has the same characteristics with SNI chicken flavor enhancer that is yellowish white. Based (SNI-01-4281-1996) regarding the flavor of chicken, stating that the characteristics of a good flavor powder is to have the appearance of a yellowish white, homogeneous, distinctive aroma broth, delicate texture powder particles and dried.

Table 2. Level Flavoring Extract Powder Color passions Pindang Bandeng

Treatment(%)	median	Average
0	7	6.2 a
12.5	7	6.3 a
15	7	6.5 a
17.5	7	7.1 a

Description: The figure followed by the same letter are not significantly different shows based on the Friedman test test level of 5%.

The average value of the color preference level can be seen in Table 6. The highest average value generated by the addition of flavoring to the treatment 17.5% maltodextrin and low in the treatment of 0%. This happens because Warma resulting from treatment 0% darker than the color of a flavoring of other treatments. Color powder flavoring a brownish color due to the heating during the drying process that led to the Maillard reaction. Maillard reaction is a reaction between the carbonyl compound reacts with reducing sugars and amines derived from amino acids (proteins from the broth boiled milkfish) and can cause brown color on food (Oliveira et al. 2014).

The addition of fillers that are too low will cause rapid powdered brown when heated, while too high. The filler is added then the resulting color tends to fade and can reduce the flavor of the main raw material (Son 2014).

3.2 Aroma passions level

Aroma received by the nose and the brain is a mixture of four aroma is fragrant, sour, rancid, and charred. The production of aroma compounds is determined by the chemical composition of the product materials, enzymes involved in it, as well as bacteria that are involved in that compound (Winarno Fakhrudin 1997 in 2009). The results of statistical calculation parameters of the aroma can be seen in (Annex 12).

Table 3. Level passions Pindang Aroma Flavoring Extract Powder Bandeng

Treatment (%)	mediam	Average
0	7	6.5 a
12.5	7	6.3 a
15	7	7 a
17.5	7	7.1 a

Description: The figure followed by the same letter showed no real difference by Friedman test at 5% level.

Friedman test results showed that the addition of maltodextrin does not influence significantly to the level of preference aroma of caramelized milk powder flavoring on multiple test level of 5%. Dihasilkanpun uniform median value is 7 (preferably) (Table 7). This means that the powder flavor aroma of caramelized milk with or without the addition of maltodextrin to give the impression that preferred by the panelists. Difference average value generated at the lowest aroma flavor of caramelized milk powder is not very significant. This happens because the maltodextrin has a scent that is odorless (Indrawati 2014).

Baharuddin (2006) states that the maltodextrin can protect the stability of the aroma during the drying process using a spray dryer. Differences in mean values can also be caused by the drying process. The process of drying a food ingredient is influenced by several factors such as temperature, humidity and drying time. Losses caused by the drying process is the change in physical properties such as pigment discoloration, changes in the structure (shrinkage) and loss of aroma. Uncontrolled drying conditions can cause the smell of charred (Munir 2017).

3.3 Texture passions level

Texture is one of consumer preference parameters in a food product. Assessment is done by feel the texture of the product by the sense of touch. Texture powder having good flavor powder particles are smooth, dry and homogeneous (SNI-01-4281-1996). Acceptance teksur powder flavor panelists are seen against a smoothness and roughness of the powder particles and how acceptance panelists against moisture levels seen in powdered flavorings (Monoarfa 2006). Statistical calculation results can be seen in texture parameters (Annex 12).

Table 4. Level passions Flavoring Extract Powder Texture Pindang Bandeng

Treatment (%)	median	On average Texture
0	5	5, a
12.5	7	6.1 a
15	7	6.4 a
17.5	7	6.1 a

Description: The figure followed by the same letter are not significantly different treatment shown by Friedman test at 5% level.

Based on Friedman test showed that the addition of maltidextrin not significantly affect the level of preference texture powder flavoring on multiple test level of 5%. The median value is generated in the treatment of 0% at 5 and 7 on the treatment the median value of 12.5%; 15%; and 17.5%. This value indicates that the product is accepted and preferred by the panelists. This happens because the texture of boiled milk powder flavoring that 0% has the texture of fine powder particles and somewhat drier. Treatment of 12.5%; 15%; and 17.5% had the texture of particles is very dry as powder milk.

According to Munir (2017) on research powdered flavorings preserved tuna, that 0% has a rough texture of the powder particles and moisture while based on research that has been done that 0% has the texture of fine particles and somewhat drier. soft. Differences texture of caramelized milk powder flavor due to the amount of filler. The filler containing carbohydrates can accelerate the drying process for a protein encapsulated agents, increase the yield and protects the material from denaturation process. The higher amount of total solids are dried to a certain extent the rate of evaporation of water will be higher. High water evaporation causes the resulting flavor powder properties will be dry (Lailiyah 2014).

3.4 Level passions Rasa

The taste is the tongue senses response to stimuli provided by a food product. The taste is an important factor in determining whether or not a product like food. Other parameters (color, aroma, and texture) of a food product is good but if it's not favored by consumers, the consumer will reject the food products (Son 2014). Friedman test results showed that the addition of maltodextrin influence significantly to the level of preference flavor powder flavor of caramelized milk, so we need multiple comparison test. Based on the results of multiple comparison test, that 0% is not significantly different from the 12.5% treatment but significantly different from the treatment of 15% and 17.5%. Treatment of 12.5% is not significantly different from that 0% and 15%, but significantly different from the treatment of 17.5%.

Table 5. Level passions Flavoring Extract Powder Flavor Pindang Bandeng

Treatment (%)	median	Average
0	5	5.7 a
12.5	7	6.5 ab
15	9	8.1 bc
17.5	7	7.3 c

Description: The figure followed by the same letter shows that there is a real difference by friedman test at test level 5%.

A median value at the level of caramelized flavor flavoring powder milkfish any additional treatment tepunng maltodextrin median values obtained ranged between 5-9 which means that the product gives the impression of a neutral and highly preferred by the panelists. The highest average value resulting from the addition of powdered flavoring with maltodextrin as much as 15% and the lowest in the treatment of 0%.

According to the Son (2014) Addition of filler increasing, it can reduce the flavor of the main raw material. Typical flavor of boiled milk flavoring powder derived from free amino acids in the broth boiled milkfish whose role is to give the flavor of the product. Free amino acids are low molecular weight compounds extractive soluble in water and is a major contributor to the flavor in fishery products (Pratt *et al* 2013).

The taste of caramelized milk flavoring powder at 0%, 12.5% have a slightly salty taste, treatment 15% had a salty and savory flavor, and treatment 17.5% had a taste too salty than other treatments. Saltiness in powdered flavoring maltodextrin influenced by the addition of more and more

Powdered flavoring boiled milkfish preferred by the panelists is 15% then applied to food products such as tempe goreng. Around 50% of households in Indonesia consume

tempeh every day either as a side dish, vegetables, and snacks. (PHOSPHATE 2005 in Ginter et al 2009).

3.5 Bayes Decision Making Method

Determination of the most important criteria in hedonic test can be done using Bayes method. The results can be seen in the data calculation (Appendix 14). Based on the calculation of the weighted criteria of color, aroma, texture and flavor flavoring powder is obtained that taste has the highest priority value compared to other criteria with a value of 0.28 (Table 10).

Table 6. Priority Value Powder flavor of caramelized milk

criteria	**Priority Values**
Color	0.22
aroma	0.24
Texture	0.26
flavor	**0.28**

Based on the calculation of the weighted criteria of color, aroma, flavor, and texture of boiled milk flavoring powder, showed that the value of the lowest priority is owned by color criteria of 0.22 while the highest criteria weights is characteristic flavor of 0.28. This indicates that the level of preference flavor is the most important criteria on the final decision of the panelists in having a product powder flavoring boiled milkfish.

Table 7. Matrix Method Valuation Bayes Decision

Treatment (%)	**Criteria**				**Value Alternative**
	Color	**aroma**	**Texture**	**flavor**	
0	6.2	6.5	5	5.7	5.64
12.5	6.3	6.3	6.1	6.5	6,31
15	6.5	7	6.4	8.1	7.18
17.5	7.1	7.1	6.1	7.3	6.68
total					25.96

Based on calculations by Bayes method showed that the powder flavor of caramelized milk with the addition of maltodextrin treatment 15% had the highest aternatif value that is equal to 7.18. The treatment of 15% to powdered flavoring boiled milkfish most preferred (Table 11).

4. CONCLUSION

The amount of filler maltodextrin right to produce powdered flavoring made from liquid waste boiled milkfish most preferably at 15% by niai median is equal to 7 (color), 7 (aroma), 7 (texture), and 9 (taste).

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