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FORMULATION AND QUALITY CHARACTERISTICS OF POWDERED BROTH MUSHROOMS T (Volvariella Volvacea) WITH SHRIMP HEAD (Caridea)

FORMULASI DAN KARAKTERISTIK MUTU KALDU BUBUK JAMUR MERANG (Volvariella Volvacea) DENGAN KEPALA UDANG (Caridea)

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Abstract

This research aims at the formulation and product characteristics, especially taste, chemistry, and economic value of palm mushroom powder broth with added shrimp heads. The powder broth was made from a composition of palm mushrooms and shrimp heads with 5 treatments, namely 100%, 75%, 50%, 25%, and 0% palm mushrooms mixed with 0%, 25%, 50%, 75%, and 100% shrimp heads. The parameters analyzed included yield analysis, solubility, moisture content, ash content, protein content, organoleptic tests (taste, color, aroma, and solubility), determination of the best treatment, and business analysis (revenue and profit). The results showed yields ranging from 12.33% to 13.81% with no significant differences between treatments. Solubility ranges from 60.52% to 81.97%; the higher the addition of palm mushrooms and the lower the shrimp heads, the greater the solubility of the powder broth. The moisture content ranges from 8.93% to 9.41%, which is higher than the moisture content of seasoning ingredients according to SNI-01-4273-1996, which has a maximum of 4%, but lower than that of flour products, which ranges from 10-12%. Different treatments of palm mushrooms and shrimp heads did not significantly affect the color, taste, aroma, and solubility of the powdered broth. However, the best treatment for panelist acceptance in terms of color, taste, texture, and aroma of the powdered broth was the treatment with 25% palm mushroom concentration and 75% shrimp head, with the highest NP of 0.792. This production can yield 1,925 bottles in one month, sold at 18,000 per bottle, generating a profit of Rp. 5,625,000.00.

Keywords : Palm Mushroom, Shrimp Head, Savory, Quality, Acceptance.

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Abstrak

Penelitian ini bertujuan untuk merumuskan dan mengarakterisasi produk kaldu bubuk berbahan dasar jamur merang dengan penambahan kepala udang, khususnya ditinjau dari segi rasa, karakteristik kimia, serta nilai ekonominya. Kaldu bubuk dibuat menggunakan kombinasi jamur merang dan kepala udang melalui 5 perlakuan, yaitu komposisi jamur merang 100%, 75%, 50%, 25%, dan 0% dengan komposisi kepala udang masing-masing 0%, 25%, 50%, 75%, dan 100%. Parameter yang dianalisis meliputi rendemen, kelarutan, kadar air, kadar abu, kadar protein, uji organoleptik (rasa, warna, aroma, dan kelarutan), penentuan perlakuan terbaik, serta analisis usaha (pendapatan dan keuntungan). Hasil penelitian menunjukkan bahwa rendemen berkisar antara 12,33% – 13,81% dan tidak menunjukkan perbedaan yang signifikan antarperlakuan. Kelarutan produk berkisar antara 60,52% hingga 81,97%; semakin tinggi proporsi jamur merang dan semakin rendah proporsi kepala udang, maka kelarutan kaldu bubuk tersebut semakin tinggi. Kadar air berkisar antara 8,93% hingga 9,41%; angka ini lebih tinggi daripada standar kadar air untuk bahan penyedap menurut SNI-01-4273-1996 (maksimum 4%), namun masih lebih rendah daripada standar SNI untuk produk tepung (berkisar 10–12%). Perlakuan variasi jamur merang dan kepala udang tidak memberikan perbedaan yang signifikan terhadap warna, rasa, aroma, maupun kelarutan kaldu bubuk. Akan tetapi, perlakuan terbaik berdasarkan tingkat penerimaan panelis terhadap warna, rasa, tekstur, dan aroma adalah perlakuan dengan konsentrasi jamur merang 25% dan kepala udang 75%, yang menghasilkan nilai NP (Nilai Produk) tertinggi sebesar 0,792. Dalam satu bulan, produksi dapat mencapai 1.925 botol dengan harga jual Rp18.000 per botol, yang menghasilkan keuntungan sebesar Rp5.625.000,00.

Kata Kunci : Jamur Kelapa Sawit, Kepala Udang, Gurih, Berkualitas, Dapat Diterima.

1. INTRODUCTION

Powdered stock is a food additive obtained from boiling meat, better known as a seasoning (Karomah, 2021). The main ingredient in stock is MSG (*monosodium glutamate).* MSG functions as a seasoning; this compound acts as a flavor enhancer called umami. Umami is a term best described as a savory taste, like broth or meat. Some natural ingredients that contain *glutamate* include mushrooms and shrimp heads.

The distribution of oil palm mushrooms in Bengkulu is quite widespread due to the large number of palm oil processing companies in the area. Palm oil processing naturally produces waste, including empty oil palm fruit bunches (EFBs). These empty fruit bunches serve as a growth medium for oil palm mushrooms. Nearly 23% of the waste produced from 1 ton of oil palm processing is EFB waste, meaning that oil palm mushrooms are readily available year-round.(Ristianingsih, 2015)

The glutamate content in palm mushrooms per 100g contains several amino acid elements including leucine 4.5g, isoleucine 3.4g, valine 5.9g, tryptophan 1.5g, lysine 7.1g, threonine 3.5g, phenyalanine 2.6g, methionine 1.1g, and histidine 3.8g (Tjokrokusumo, 2018). Other ingredients that also contain high levels of glutamic acid are shrimp, shrimp contain ±20.45 mg of glutamic acid.

Shrimp is an underutilized natural resource, typically used only for consumption. This means that many parts of the shrimp are still underutilized, resulting in waste from shrimp processing. The potential for shrimp consumption byproducts is quite large, at 36-49 % (Meiyani, 2014). Given this significant waste potential, efforts are needed to reduce the significant amount of waste from shrimp processing. Furthermore, shrimp waste also contains potential chemical compounds found in the shells and heads. These shells and heads contain high levels of chitosan.

Chitosan has antimicrobial properties with a broad spectrum, both against bacteria, fungi and mold (Winarti et al., 2012 in Apriyani, 2020) . Therefore, the chitosan content contained in the shells and heads of shrimp can help increase the potential durability of the resulting product (Apriyani, 2020) so that it can also be used as a processed product. Further processing of palm mushrooms and shrimp heads is to make powdered broth that functions as a natural flavoring additive. However, the

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formulation and characteristics of the product, especially the taste and chemical as well as the economic value of palm mushroom powder broth with the addition of shrimp heads, need further testing to obtain a natural broth product and its quality is tested.

2. RESEARCH METHOD

The research was conducted through the following stages:

a. Prepare the main ingredients for powdered stock (palm mushrooms and shrimp heads).
b. Sorting the separation of oil palm mushrooms from dirt in the form of soil and the remains of empty oil palm bunches attached to the oil palm mushrooms.
c. Wash the palm mushrooms and shrimp heads to remove any dirt, then cut them into pieces measuring ± 1.5 cm.
d. Palm mushrooms and shrimp heads with the composition according to the treatment are roasted for 15 minutes, then added with additional ingredients (50 gr carrots, 25 gr onions, 25 gr shallots, 25 gr garlic, 20 gr spring onions, 10 gr celery, 30 gr salt, 2 gr pepper, and 5 gr sugar) which have been sliced and roasted again for 15 minutes.

e.The powdered stock is left for at least 5 minutes, then the powdered stock is oven-baked at 180°C for 45 minutes, and then ground using a blender, then the powdered stock is sieved to ensure even distribution.

The analysis carried out was yield, solubility, chemical analysis (water content, ash and protein content), organoleptic test analysis, best treatment analysis (formulation), income and profit analysis.

This research method uses a Completely Randomized Design (CRD) consisting of 1 factor, namely the composition of palm mushrooms and shrimp heads with 5 variations. The data obtained consists of 5 samples with 3 replications. Furthermore, the data obtained were analyzed using the *analysis of variance* (ANNOVA) method, if differences are found between samples, it will be continued with a significant difference test using *Duncan's Multiple Range Test* (DMRT) analysis at a significance level of 5%.

3. RESULT AND DISCCUSSION

Powdered Stock Yield

Yield is an important parameter for determining the economic value of product and material effectiveness. Yield calculation is a percentage of the final weight compared to the initial weight of the product. The higher the yield, the higher the economic value of the product (Maulida, 2005). The initial weight is the total raw material before processing, and the final weight is the total raw material after processing. The research results show the average yield analysis in Table 1.

Table 1. Results of analysis of powdered broth yield

Treatment Addition of S awit Mushrooms : Shrimp Heads	Yield (%)
100% : 0%	12. 33 [a]
75% : 25%	13 . 13 [a]
50% : 50%	13 . 13 [a]
25% : 75%	13 . 24 [a]
0% : 100%	13 . 81 [a]

Note: Numbers followed by the same letter code indicate no significant difference.

According to Fauzanin (2013), the yield value obtained in the study of palm mushroom powder broth with the addition of shrimp heads is related to the cooking loss data. The yield value tends to decrease with increasing cooking loss. Yield also influences the economic value of a food product. Yield is very important in determining the economic value of a product; high economic value is obtained from products with high yield values.

Table 1 shows the yield calculation analysis with an average between 12.33% and 13.81%. Based on the results of statistical tests, the treatment of adding palm mushrooms and shrimp heads to

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the yield of powdered broth did not differ significantly, meaning there was no effect of the treatment on the yield. The highest powdered broth yield was obtained with the addition of 0% palm mushrooms and 100% shrimp heads with an average value of 13.81%, while the lowest was obtained with the addition of 100% palm mushrooms and 0% shrimp heads with an average value of 12.33%. The low yield of powdered broth with the addition of palm mushrooms and shrimp heads was due to the low water content, resulting from the reduction in water content in the raw materials after cooking. This was also caused by the high water content of palm mushrooms, which was 91.94% , resulting in shrinkage during the cooking process (Fadly, 2021).

Analysis of Physical and Chemical Properties

The results of the analysis of physical properties in the form of solubility and chemical properties consisting of water content, ash content and protein content of palm mushroom powder broth with the addition of shrimp heads can be seen in table 2 .

Table 2. Analysis of Powdered Broth Solubility

Treatment Mushroom : Shrimp Head	Level Solubility (%)	Level Water (%)	Protein Content (%)	Level Fiber (%)
100% : 0%	76.26 [b]	8.93 [e]	0.44 [d]	18.37 [d]
75% : 25%	81.97 [a]	9.20 [c]	0.52 [b]	18.53 [c]
50% : 50%	61.11 [c]	9.16 [d]	0.55 [a]	26.41 [a]
25% : 75%	78.65 [b]	9.49 [a]	0.49 [c]	17.28 [e]
0% : 100%	60.52 [d]	9.41 [b]	0.49 [c]	23.52 [b]

Note: Numbers followed by different letter codes indicate a significant difference at the 5% significance level.

a) Solubility Analysis of Powdered Broth

A solution is a homogeneous mixture consisting of two or more substances. A solution contains a solvent and a solute. Solubility is the maximum amount of a compound or substance that can dissolve in a given amount of solvent.

The results of the solubility analysis of powdered broth with the addition of palm mushrooms and shrimp heads with an average value of 60.52% to 81.97%. The highest solubility with the addition of palm mushrooms 75% shrimp heads 25% with an average value of 81.97%, while the lowest solubility level was achieved with the addition of 0% palm oil mushrooms and 100% shrimp heads with an average value of 60.52%. Based on the calculation of statistical analysis of the addition, it shows that there is a significant difference between the treatments, the higher the addition of palm oil mushrooms and the lower the shrimp heads, the higher the solubility of the powdered broth. This indicates that the shrimp heads are difficult to dissolve due to the insoluble chitin content. In addition, the fiber content in palm oil mushrooms also makes the powdered broth difficult to dissolve (Prasetya, 2019).

b) Analysis of Water Content of Powdered Stock

analysis is crucial for product quality stability. Water content in food ingredients determines freshness and shelf life; high water content facilitates bacterial growth (Winarno, 1997). The results of the water content analysis for the palm mushroom powder broth product with added shrimp heads are shown in Table 2.

Statistical calculations show that the addition of palm mushrooms and shrimp heads significantly differed. This means that the addition of palm mushrooms and shrimp heads affected the water content of the powdered broth. This is due to the high water content of the palm mushrooms, which is 94.60%. This causes the free water in the broth mixture to evaporate easily, especially when the percentage of palm oil mushrooms is high (Prasetya, 2020).

Low water content in powdered broth can extend shelf life, conversely, the higher the water content in powdered broth, the shorter the shelf life and accelerate the growth of microorganisms (Janitra, 2022). According to SNI-01-4273-1996, the maximum water content of flavoring ingredients

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is 4%. Based on Table 1, the average water content of powdered broth with the addition of palm mushrooms and shrimp heads is higher than the SNI, namely between 8.93% and 9.41%, meaning it does not meet the SNI. This is because the oven dryer used is still a household oven that is not equipped with a vacuum device, so that the water content released into the air still returns to the dried material, meaning that the drying process is not perfect. However, this water content is lower than the SNI for flour, which ranges from 10-12% (Hartanto, 2012). Therefore, researchers stopped drying during the study. The water content of the broth makes it difficult for microorganisms to grow and develop.

c) Protein Content Analysis

Protein is a macronutrient in food that is needed by the body and consists of interconnected amino acids. Some proteins come from animals that have essential amino acids, while plant protein sources are incomplete proteins (Widarno, 2008). Protein is an organic substance that acts as a building block in the body. Protein is composed of 20 different types of amino acids that bind to each other as a catalyst for biochemical processes in the body, a carrier of movement, a regulator of genetic expression, a neurotransmitter, a structural strengthener, and an immune booster (Dedes, 2018). The results of the analysis of the protein content of powdered broth with 5 different treatments can be seen in table 2.

Based on statistical tests, the addition of palm fungus and shrimp heads significantly affected the protein content of the powdered broth. This indicates the effect of the treatment on the resulting powdered broth. The higher the palm fungus and shrimp head content, the lower the protein content. However, the right combination of the two, at 50%, resulted in a high protein content. The highest protein content was found in the treatment with 50% palm fungus and 50% shrimp heads. with an average value of 0.55%, which is significantly different from the treatment of adding 100% shrimp head and 0% palm mushroom with an average value of 0.44%. This is due to the high protein content in shrimp heads, namely 7.58% (Massi, 2023) while in palm mushrooms it is 34.24% (bk) (Prasetya, 2019). The combination of the two produces mushroom broth with the highest protein content among the treatments.

However, the protein analysis results of the powdered broth with the addition of palm mushrooms and shrimp heads, which ranged from 0.44% to 0.55% on average, indicated that it did not meet the minimum quality criteria for powdered broth, which is 7%. This is due to the low composition of palm mushrooms and shrimp heads compared to the other ingredients. Therefore, the total weight of palm mushrooms and shrimp heads can be said to be still low compared to the total ingredients as a whole, resulting in a low protein content (Istiqomah, 2020).

d) Analysis of Fiber Content of Powdered Broth

Dietary fiber is a soluble food ingredient that is essential in food because it traps fat in the digestive tract and reduces heart disease. Increasing soluble fiber in a food product significantly impacts the nutritional value of the food due to its physiological benefits in lowering blood glucose and cholesterol levels (Hardiyanti, 2019). The results of the analysis of the fiber content of powdered broth are shown in Table 2.

The results of the analysis of the fiber content of powdered broth with the addition of palm mushrooms and shrimp heads with an average value of 17.28% to 26.41%. The highest fiber content with the addition of 50% palm mushrooms and 50% shrimp heads with an average value of 26.41% while the lowest fiber content with the addition of 25% palm mushrooms and 75% shrimp heads with an average value of 17.28%. The results of statistical calculations show a significant difference between the treatment with the addition of palm mushrooms and shrimp heads on the fiber of powdered broth. The high fiber content is influenced by the accumulation of fiber content in palm mushrooms and shrimp heads, where the fiber content in palm mushrooms is 39.83% while the fiber in shrimp heads is 2% (Yanto, 2010).

Organoleptic of Powdered Stock

Organoleptic testing is the testing of food ingredients based on preferences and desires for a product. Organoleptic testing, also known as sensory testing, utilizes the human senses as the primary

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means of assessing a product. The senses used in this testing include sight, smell, taste, and touch. These sensory abilities will be used to assess the product being tested, based on the stimuli received by the senses. Sensory assessment capabilities include the ability to detect, recognize, differentiate, compare, and assess likes and dislikes (Larasati, 2020). The results of the organoleptic test analysis of the parameters of color, taste, aroma, and solubility can be seen in table 3 .

Color

The results of the organoleptic analysis of the color of powdered broth with the addition of palm mushrooms and shrimp heads with an average value of 3.05% to 4.05%. The highest color intensity was found in the addition of 75% palm mushrooms and 25% shrimp heads with an average value of 4.05%. The lowest color intensity was found in the treatment of adding 25% palm mushrooms and 75% shrimp heads with an average value of 3.05%. The results of the statistical analysis showed that the addition of palm mushrooms and shrimp heads showed no significant difference.

An attractive color will entice panelists or consumers to sample a product (Winarno, 2004). He added that consumer acceptance of a product can be directly influenced by the value or scale of the color parameter. The color of the powdered broth produced in this study ranged from yellowish brown, due to the color produced by the palm fungus and shrimp heads.

Table 3. Average Panelist Preference Values for Color, Taste, Aroma, and Solubility of Palm Mushroom Powder Broth with Added Shrimp Heads

Treatment Mushroom : Shrimp Head	Color	Flavor	Aroma	Solubility
100% : 0%	3. 70 ^{a}	3. 80 ^{a}	4. 30 ^{a}	4. 20 ^{a}
75% : 25%	4.05 ^{a}	3.95 ^{a}	3.95 ^{a}	3.70 ^{a}
50% : 50%	3. 85 ^{a}	4. 25 ^{a}	3. 95 ^{a}	3.00 ^{a}
25% : 7 5%	3.0 5 ^{ab}	3. 65 ^{a}	3 . 20 ^{ab}	2 . 9 0 ^{a}
0% : 100%	3. 50 ^{a}	3. 25 ^{a}	3 . 05 $^{a b}$	2.45 ^{a}

Flavor

Taste is a chemical stimulus that reaches the tongue's taste buds, specifically the basic tastes of sweet, sour, salty, bland, and bitter. Organoleptic testing aims to determine the panelists' level of preference for a product in each treatment (Kurniawan, 2020).

The results of the statistical analysis of panelists' acceptance of the taste of powdered broth with an average value of 3.25% to 4.25%. The level of panelists' preference for the taste of the five powdered broth treatments showed no significant difference. The highest taste value was found in the treatment of adding 50% palm mushrooms and 50% shrimp heads with an average value of 4.25%, while the lowest taste value was found in the treatment of adding 0% palm mushrooms, 100% shrimp heads with an average value of 3.25%. The combination of shrimp and palm mushrooms provides a savory and balanced taste to the powdered broth. This is in accordance with research by Rosianti, (2024) where the use of palm mushrooms in mocaf meatballs is preferred because of the savory taste due to the glutamate contained in palm mushrooms. The glutamate content of palm mushrooms reaches 4.0428 grams per 100 grams of material. (Asngad et al., 2021). Powdered stock has a distinctive savory flavor, derived from other ingredients such as carrots, celery, leeks, shallots, garlic, and onions.

Aroma

The results of the organoleptic test analysis of panelists' acceptance of the aroma of powdered broth showed an average value of 3.05% to 4.40%. The panelists' level of preference for the aroma of the five powdered broth treatments showed significant differences. The highest aroma value was found

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in the treatment of adding 100% palm mushrooms and 0% shrimp heads, namely 4.30%, while the lowest aroma value was found in the treatment of adding 0% palm mushrooms and 100% shrimp heads, namely 3.05%.

Aroma is a crucial factor in attracting consumers to food products, imparting a distinctive flavor. Aroma is the sensation of volatile compounds perceived by the nasal cavity (Wijaya, 2012). The aroma of powdered broth was more dominant with the addition of 0% palm oil mushrooms and 100% shrimp heads. In this study, the dominant aroma came from the shrimp heads, which have a distinctive savory aroma.

Solubility

Solubility is the maximum amount of a compound or substance that can be dissolved in a given amount of solvent. Factors that can affect solubility include pressure, volumetric size and weight, intermolecular forces, and temperature. Based on the organoleptic solubility test, the average value was 2.45%-4.20% with the highest value in the treatment of adding 100% palm fungus and 0% shrimp heads, while the lowest average was in the treatment of adding 0% palm fungus and 100% shrimp heads. According to statistical analysis, the treatment of adding palm fungus and shrimp heads to the solubility of powdered broth showed no significant difference.

Best Treatment

Determination of the best treatment based on organoleptic tests using the *De Garmo method* (Prameswari, 2013). The results of the *De Garmo calculation* were obtained The best treatment to determine the treatment value based on the average color, aroma, taste and solubility of the palm mushroom powder broth with the addition of shrimp heads. The determination of the best treatment for panelists was carried out using the effectiveness index method. (Susilawati, 2024 in Saputra, 2025). The best treatment of powdered broth can be seen in table 4 .

Table 4. Best Treatment of Powdered Stock

Parameter	Weight Total	K1		K2		K3		K4		K5	
		NE	NP	NE	NP	NE	NP	NE	NP	NE	NP
Color	0.192	0.8	0.14	0.00	0.00	0.75	0.14	0.56	0.11	1.00	0.19
Flavor	0.318	0.6	0.12	0.64	0.20	0.79	0.25	1.00	0.32	0.00	0.00
Texture	0.206	0.4	0.09	0.00	0.00	0.43	0.09	0.86	0.18	1.00	0.21
Aroma	0.283	0.8	0.22	0.44	0.13	1.00	0.28	0.67	0.19	0.00	0.00
total	1	2,528	0.571	1,087	0.330	2,964	0.766	3,086	0.792	2,000	0.399

Note : the best treatment is the treatment with the highest NP value,

The results of the analysis of the best treatment for panelists' acceptance of the color, taste, texture and aroma of powdered broth were found in the K4 treatment with a concentration of 25% palm mushroom and 75% shrimp head with the highest NP, namely 0.792.

Business Analysis (Revenue and Profit)

Revenue is the result of multiplying the amount of production produced with the selling price of the product, while profit is the difference between income and costs incurred (Nuryanti & Kasim, (2017) in Sari, et. al., 2026) and Bud iwan , (2019) . The practices used by children on analysis business yaitupadasampel addition of 25% palm oil mushrooms and 75% shrimp heads.

If it is assumed :

The price of one bottle of powdered stock is 18,000, weighing 80g

Number of Products = 19.25 bottles/production time

Production = 4000 recipes/month

Revenue = Production x Price

= 1925 x 18,000 = 34,650,000

Total Profit =

TR-TC = 34,650,000 - 29,024,500 = R p 5,625,500

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Table 5. Powdered Stock Business Analysis

Fixed Cost

Equipment	amount	Price (Rp)	
Medium basin	2	10,000	20,000
cutting board	1	10,000	10,000
Spatula	1	10,000	10,000
Aluminum baking pan	3	120,000	360,000
Gas stove	1	350,000	350,000
Wok	1	35,000	35,000
Knife	2	5,000	5,000
Digital scales	1	55,000	55,000
Scissors	1	5,000	5,000
Cormorant	1	150,000	150,000
Spoon	5	2,000	10,000
Gas cylinders	1	150,000	150,000
Oven	1	2,855,000	2,855,000
Gas refill	1	23,000	23,000
Electricity	1	120,000	120,000
Bottle packaging	1925	1,500	2,887,500
Labor wages	1	2,400,000	2,400,000
Blender	1	300,000	300,000
Total			9,745,500

Variable Costs

Material	Unit	Number (days/month)	Price (Rp)	
Palm mushroom	Kg	0.025	75.00	0
Shrimp head	Kg	0.075	225,000	0
Leek	Kg	0.020	60,000	3,600,000
Celery leaves	Kg	0.010	30,000	1,440,000
Red onion	Kg	0.025	75,000	4,200,000
Garlic	Kg	0.025	75,000	3,000,000
Onion	Kg	0.025	75,000	3,600,000
Carrot	Kg	0.050	150,000	1,200,000
Sugar	Kg	0.005	15,000	240,000
ground pepper	Kg	0.002	6,000	199,998
Fine salt	Kg	0.030	90,000	1,800,000
Total		0.092		19,279,998
Total production costs	9,745,000 + 19,279,998			29,024,998

The production of this powdered broth uses 25 grams of palm mushrooms, 150 grams of shrimp heads, 20 grams of spring onions, 10 grams of celery leaves, 25 grams of shallots, 25 grams of garlic, 25 grams of onions, 50 grams of carrots, 5 grams of sugar, 2 grams of ground pepper, and 30 grams of fine salt. After production, it produces 38.6608 grams of powdered broth per recipe. The production of powdered broth takes 2 hours per oven. One production of powdered broth can make 40 recipes. Working hours start from 08:00-16:00, so that in one day there are 4 productions. If the production of powdered broth is accumulated in one month, the total number of products produced is 1925 bottles of powdered broth with a selling price of 18,000 / bottle, the profit obtained is Rp. 5,625,500.

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4. CONCLUSION

Based on the results of research on the analysis of powdered broth with the addition of palm mushrooms and shrimp heads, the following conclusions can be drawn:

1. Based on the results of statistical tests, the treatment of adding palm oil mushrooms and shrimp heads to the yield of powdered broth was not significantly different, meaning there was no effect of the treatment on the yield.
2. The average moisture content of powdered broth with added palm mushrooms and shrimp heads is higher than the Indonesian National Standard (SNI), at between 8.93% and 9.41%, meaning it does not meet the SNI standard. However, this moisture content is lower than the SNI for flour, which ranges from 10-12%.
3. The organoleptic value of powdered broth with the addition of palm mushrooms and shrimp heads did not differ significantly in color, taste, aroma, and solubility.
4. The results of the analysis of the best treatment for panelists' acceptance of the color, taste, texture and aroma of powdered broth were found in the K4 treatment with a concentration of 25% palm mushroom and 75% shrimp head with the highest NP, namely 0.792.
5. Analysis of the powdered broth business after production in one month can produce 1925 bottles, with a selling price of 18,000 per bottle with a profit of Rp. 5,625,000.

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