

Consumer acceptability analysis of mocaf flour-based noodles sacha inchi seed dregs flour substitution

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ABSTRACT

Noodles are one of the food products that are very popular, of course, by people in Indonesia. Besides being popular, noodle products are used as alternative food products to replace rice. The data collection method in this study used quantitative methods. The population in this study is staff who work in the kitchen section of Hotel Borobudur Jakarta for limited panelists. Then there are Kartini Elementary School students for untrained panelists. In consumer acceptance, a portion-level test is carried out to determine whether panelists eat out the food provided or not. This test measures the amount and lack of food served when provided. The portion level test was carried out on 5 limited panelists who were kitchen section staff of Hotel Borobudur Jakarta and 50 panelists of children who were students of Kartini Jakarta Elementary School. The highest level of preference in the manufacture of dry noodle products made from MOCAF flour, the substitution of sacha inchi seed pulp flour with 85% MOCAF flour formulation and 15% sacha inchi seed pulp flour.

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INTRODUCTION

Food diversification is a number of contexts that include food production, availability, and consumption (Suhardjo, 1998 in Hardono, 2014). According to (Setiawan, 2012 in Hardono, 2014) Food diversification is the choice of alternative foods that aim to reduce dependence on one dominant type of food (Hardono, 2014). Rice is the dominant food in Indonesia. Based on opinions (Hardono, G.S, 2014) Food diversification has a good achievement by paying attention to consumption patterns that are safe for the body and have quality and have balanced nutrition (Sihmawati, RR and Rosida, DA and Panjaitan, 2019). In the context of food diversification in Indonesia, it already has a variety of diverse products for basic needs, one example is noodles (Hasni, Dian and Nilda, Cut and Amalia, 2022).

Noodles are one of the food products that are very popular, of course, by people in Indonesia (Gumelar, 2019). Besides being popular, noodle food products are used as alternative food products to replace rice (Sihmawati, RR and Rosida, DA and Panjaitan, 2019). Processed noodle foods are usually made from the main ingredient, namely wheat flour (Sihmawati, RR and Rosida, DA and Panjaitan, 2019). According to (Alifah, Siti and Nurfida, Anita and Hermawan, 2019) The need to consume noodles is the second priority after rice as a staple food and is quite liked by people in Indonesia ranging from children, adolescents, adults to the elderly. This is because of the practical character of noodles and easy to process with various recipes so that they are easy to serve (Asmoro, 2021). Noodles can be classified into several groups, namely wet noodles, dry noodles, boiled noodles, and instant noodles (Asmoro, 2021). The first process that has been made into raw noodles from the dough sheet cutting process has a moisture content of 35% (Widiati, Siti and Azkia, 2023). Various groups have a process before consuming noodles with the continuation of the process of making wet noodles with a boiling process, while dry noodles can be continued drying using an oven (Pratama, 2022). In making noodles, the main ingredient of wheat flour is used (Gusriani, Ika and Koto, Hidayat and Dany, 2021).

The habit of using wheat flour for consumption by the public in consuming wheat flour not only causes an increase in the value of Indonesian imports, but has a major influence on the body of consumers (Firani, Novi Khila and Permatasari, Happy Kurnia and Irnandi, 2021). Because wheat flour is a wheat product rich in gluten type protein, gluten is used by glutenin and gliadin (Hasni, Dian and Nilda, Cut and Amalia, 2022). Glutenin is a strand of amino acids which has chewy and fluffy properties due to the impermeable air content. The type of gluten contained in wheat flour cannot dissolve in water so it is difficult to digest, and noodles made from wheat flour cannot be fully consumed by people who have autistic disease because the content in wheat can cause allergies so that people with autistic disease can go (Murniyati et al., 2010 and Gumelar, 2019). In 2021, wheat flour has a national demand of 6.96 million or equivalent to 8.9 million tons of wheat so that it experienced a growth of 4.6 percent when compared to 2020 records at that time, national wheat flour needs of 6.6 million tons or equivalent to 8.6 million tons, reported from article *Bisnis.com* (2022). The high price of wheat flour makes the noodle industry look for alternatives to replace or reduce the use of wheat flour (Gusriani, Ika and Koto, Hidayat and Dany, 2021). And the search for alternatives can not only minimize expenses but can provide benefits such as the use of MOCAF flour as the main ingredient in making noodles and substitution with sacha inchi seed pulp flour so that it provides many benefits for consumers, especially for children in improving nutrition to stunting in children (Khasanah, Via and Astuti, 2019).

The condition of children who have a short posture is commonly called stunting (Zahara, 2020). Chronic malnutrition in the long term is a problem that causes stunting in children, this is caused by insufficient feeding of nutritional needs that should be obtained (Kim, Dah-Sol and Joo, 2019). The incidence of stunting prevalence increases at the age of 3 months which then the stunting process begins to slow down when children have the age of about 3 years (Mukodi, dan Rahmawati, 2023). In the incidence of stunting, there are differences in interpretation between the two age groups of children (Widiati, Siti and Azkia, 2023). In children under the age of 2-3 years, describes the process of failure to grow or stunting that is still ongoing. While in children aged more than 3 years, describe a situation where the child has experienced growth failure commonly called *stunted* (Fikawati S, et al., 2017). Human growth is the result of the interaction between genetic factors, hormones, nutrients and energy with environmental factors (Firani, Novi Khila and Permatasari, Happy Kurnia and Irnandi, 2021). The process of human growth is a complex phenomenon that lasts for approximately 20 years, starting from the womb to adolescence which is the result of the interaction of genetic and environmental factors (Arfiati, 2023). In childhood, height gain in the first year of life is the fastest compared to the time period after (Sitinjak, Anna Angela and Simatupang, 2021). At the age of 1 year, children will experience an increase in height

up to 50% of the birth length, then the height increases 2-fold at the age of 4 years and 3-fold at the age of 13 years (Fikawati, 2019).

This research has several implications that can affect various aspects, both in the food industry and public health aspects. **Increased Nutritional Value:** Sacha inchi is known to be rich in omega-3 fatty acids, protein, and fiber. If the substitution of sachu inchi seed pulp flour in mocaf flour is successfully applied in food products, this can increase the nutritional value of the product. **The implication is the improvement of public health through the consumption of more nutritious foods.** **Impact on the Agricultural Industry:** If this research drives the demand for sachu inchi seeds and other ingredients used in the production of mocaf flour, it can have a positive impact on the agricultural industry that produces such raw materials. Farmers and producers of sachu inchi seeds and other raw materials could see increased demand and new economic opportunities. **Sustainability Aspect:** If the use of sachu inchi seed pulp as a raw material in the food industry can reduce waste and utilize previously neglected resources, this also has a positive impact on environmental sustainability aspects. Reducing food waste and more efficient use of natural resources can contribute to environmental protection efforts. **Changes in Taste and Texture:** Substitution of ingredients in food formulations can affect the taste, aroma, and texture of the final product. If the results show significant changes in this regard, food manufacturers will need to make adjustments so that the product still meets consumer expectations. **Increased Consumer Knowledge:** The results of this study can increase consumer awareness about sachu inchi seeds as a highly nutritious food. Consumers will have more in-depth knowledge of the health benefits that products that use these substitutions may have.

RESEARCH METHOD

The data collection method in this study used quantitative methods. The quantitative method according to Sugiyono (2022) is a research method based on data collection using objective research instruments and data analysis that is the number or number of statistics that aims to test the hypotheses that have been set. The type of research used in this study is a type of experimental research to look for the effect of a certain treatment (Sugiyono, 2022).

The population in this study is staff who work in the *kitchen section* of Hotel Borobudur Jakarta for limited panelists. Then there are Kartini Elementary School students for untrained panelists. In determining respondents, researchers used 5 *kitchen section staff* of Hotel Borobudur Jakarta to test noodle products based on organoleptic tests which they could then taste and choose products they liked, and untrained panelists totaling 50 people who were students of Kartini Elementary School

Analysis carried out in the results of trial data conducted by each panelist then the researcher made an arrangement of each data and summed the whole then divided according to the number of panelists, the summation was carried out using the SPSS 25 for *windows* (*Statistical Package for the Social Sciences*) program using these tools to determine the average value in the trial treatment and SPSS could see the results of the hypotheses contained in the study.

RESULTS AND DISCUSSIONS

Consumer Acceptability

In consumer acceptance, a portion level test is carried out intended to determine whether panelists eat out the food that has been provided or not. This test aims to measure the amount and lack of food served when provided. The portion level test was carried out on 5 limited panelists who were *kitchen section staff* of Hotel Borobudur Jakarta and 50 panelists of children who were students of Kartini Jakarta Elementary School (Rodeiro, Idania and Remirez, Diadelis and Flores, 2018).

Table 1. Portion out rate against limited panelists

| Portion Expense Rate | | | | |
|----------------------|-------------|--------------|--------------|--------------|
| Product | Control 631 | Products 641 | Products 651 | Products 661 |
| Result | 3,4 | 4,2 | 2,4 | 1,8 |

In Table 1, it can be seen that the highest level of acceptability is MOCAF-based noodles with 15% sacha inchi seed pulp flour substitution and the second level in control product 631 which is noodles with 100% MOCAF flour (Yani, Ade Vera and Akbar, 2019). And the lowest is noodle products 651 with a ratio of 70% MOCAF flour 30% sacha inchi seed pulp flour and 661 with a ratio of 55% MOCAF flour 45% Sacha inchi seed pulp flour (Yessirita, Nita and Hermalena, Lefy and Ayesha, 2021).

Table 2. Portion out rate against children panelists

| Portion Expense Rate | | | | |
|----------------------|-------------|--------------|--------------|--------------|
| Product | Control 631 | Products 641 | Products 651 | Products 661 |
| Result | 3,16 | 4,1 | 3,08 | 2,26 |

In Table 4.23, the highest acceptability rate result is noodle product 641 with a ratio of 85% MOCAF flour and 15% sacha inchi seed pulp flour, while the second highest acceptability rate is 631 control product with a ratio of 100% MOCAF flour (Putri, Nia Ariani and Herlina, Herlina and Subagio, 2018). And the lowest degree of acceptability is product 651 and product 661.

Nutritional Content in Noodles

In this study, there are proximate test results of dry noodles made from wheat flour obtained from Nilaigizi.com sources (2021) and noodles made from MOCAF flour substitution of sacha inchi seed pulp flour obtained from the GIS Lab (2023) (Salsabila, 2022).

The following is the nutritional content of dry noodles made from wheat flour per 100 grams of proximate results:

Table 3. Nutritional content of wheat flour noodles

| Parameters | Sum |
|---------------|----------|
| Energy | 339 kcal |
| Total Fat | 1.70 g |
| Total Carbs | 6.30 g |
| Protein | 10 gr |
| Water Content | 10.60 g |
| Ash content | 1.40 g |

Results of proximate test and fatty acid test on noodles made from MOCAF flour substitution of sacha inchi seed pulp flour per 100 grams (Helilusiatiningsih, 2023). It can be noted that each dose or ingredient used can affect the results of the product content.

Table 4. Nutritional content of mocaf flour noodle substitution of sacha inchi seed dregs flour

| Parameter | Simple | Double | Average |
|-----------------------------|-------------|-------------|-------------|
| Energy | 378,03 Kcal | 378,09 Kcal | 378,06 Kcal |
| Energy From Fat | 26,19 Kcal | 27,45 Kcal | 26,82 Kcal |
| Kadar Abu | 3,18% | 3,25% | 3,215% |
| Up to Air | 5,95% | 6,04% | 5,995% |
| Karbohidrat (By Difference) | 78,26% | 78,26% | 78,26% |
| Total Fat Content | 2,91% | 3,05% | 2,98% |
| Up to Protein | 9,70% | 9,40% | 9,55% |
| Omega 3 Fatty Acids | 524.3 gr | 548.7 gr | 536.5 gr |
| Omega 6 Fatty Acids | 776.9 gr | 815.0 gr | 795.95 gr |
| Omega 9 Fatty Acids | 831,0 | 871.3 gr | 851,15 gr |

It can be seen from the difference in content from the proximate test results above shows that the energy of dry noodles made from MOCAF flour substitution of sacha inchi seed pulp flour is higher with an average value of 378.06 Kcal (Salamah, Umi and Hanik, Nur Rokhimah and Eskundari, 2023). And the superior nutritional kandugan in dry noodles made from MOCAF flour substitution of sacha inchi seed pulp flour contains omega-3 fatty acids as much as 536.5 grams, omega-6 as much as 795.95 grams, omega-9 as much as 851.15 grams.

From the results of nutritional value in noodles made from mocaf flour, the substitution of sacha inchi seed pulp flour when compared to the value of protein content in table 5 which contained an average protein of 49.48% had a decrease when it was made into noodles by 9.55%, this is due to the ratio of sacha inchi seed pulp flour which is given only 15% for making noodles and has gone through various processes such as steaming for the formation of noodle dough and then boiling to ripen the noodles (Yaver, 2023).

Table 5. Nutritional value information per 100g of noodles

| NUTRITIONAL VALUE INFORMATION | | |
|-------------------------------|----------|------|
| Serving size 100 g | | |
| QUANTITY PER SERVING | | |
| Total energy | 380 kcal | |
| Energy from fat | 25 kcal | |
| | | %DV* |
| Total fat | 3 g | 4 % |
| Protein | 10 g | 16 % |
| Total carbohydrates | 78 g | 24 % |

* Percent RDA based on energy needs 2150 kcal. Your energy needs may be higher or lower.

Contains 537 mg of Omega-3, 796 mg of Omega-6 and 851 mg of Omega 9 per serving

Table 6. Nutritional value information per 60g of noodles

| NUTRITIONAL VALUE INFORMATION | | |
|-------------------------------|----------|------|
| Serving size 60 g | | |
| QUANTITY PER SERVING | | |
| Total energy | 230 kcal | |
| Energy from fat | 15 kcal | |
| | | %DV* |
| Total fat | 2 g | 3 % |
| Protein | 6 g | 10 % |
| Total carbohydrates | 47 g | 14 % |

* Percent RDA based on energy needs 2150 kcal. Your energy needs may be higher or lower.

Contains 322 mg of Omega-3, 478 mg of Omega-6 and 511 mg of Omega 9 per serving

In the noodle research that has been made, there is an increase in nutrition in its special noodles on omega 3, 6, 9 fatty acids so that it can be said that this study succeeded in improving nutrition in dry noodles. In the Nutritional Tilapia Information in the calculation results of the Nutritional Content Rate (RDA) table per 60 grams that corresponds to the product in the packaging. Has 3% total fat, 10% protein, 14% carbohydrates with nutritional excellence in the content of noodles as much as 322mg Omega-3, 478mg Omega-6, and 511mg Omega 9 in 1 serving of noodles.

Calculation of the Selling Price of Dry Noodles

Total Material Budget

Table 7. Material budget calculation

| No | Material Name | Many | Unit Price | Unit | Sum |
|-------------------|-----------------------------|-------------|------------|-----------------|------------|
| 1 | MOCAF Flour | 1000 gr | IDR 21,000 | Kg | IDR 21,000 |
| 2 | Sacha inchi seed pulp flour | 250 gr | - | Medical history | - |
| 3 | Egg | 2 pcs | IDR 2,000 | pcs | IDR 4,000 |
| 4 | Salt | 250 gr | IDR 2,500 | Gr | IDR 2,500 |
| 5 | Mineral water | 1pcs bottle | IDR 3,000 | Pcs | IDR 3,000 |
| 6 | Packaging | 25pcs | IDR 50,000 | 50pcs | IDR 25,000 |
| Total Ingredients | | | | | IDR 55,500 |

Source: Results of Researcher Data, (2023)

Operating Costs

| | | | | |
|-----------------------|-------------------|-------|---------------|---------------|
| 1) | Employee Salaries | : 20% | x IDR 55,500; | = IDR 11,100; |
| 2) | Tool Drafting | : 5% | x IDR 55,500; | = IDR 2,775; |
| 3) | Fuel Cost | ; 5% | x IDR 55,500; | = IDR 2,775; |
| Total Operating Costs | | | | = IDR 16,650; |

Cost of Goods Sold

Total Materials + Total Operating Costs
= IDR 55,500; + IDR 16,650; = IDR 72,150;

4.5.4 Profit

Desired Profit (%) x Cost of Goods Sold
15% x IDR 72,150 = IDR 10,822;

4.5.5 Unit Price Per Serving

Cost of Goods Sold: Portion
= Rp. 72.150: 17 = Rp 4.244; rounded up to Rp. 4.250;On.

CONCLUSION

Based on the results of research on making dry noodle products made from MOCAF flour, substitution of sacha inchi seed pulp flour, it can be concluded that: The formulation of making dry noodle products made from MOCAF flour substitution of sacha inchi seed pulp flour produces a color that is not pale, a chewier texture, a nutty taste found in the noodles, and an aroma in the noodles that tastes peanuts. The highest level of preference in the manufacture of dry noodle products made from MOCAF flour, substitution of sacha inchi seed pulp flour with 85% MOCAF flour formulation and 15% sacha inchi seed pulp flour. With average scores of favorability levels on panelists limited to (Color 3.80), (Aroma 3.40), (Taste 3.40), (Texture 3.80) and (Overall 3.80 and favorability level on children's panelists based on (Color 3.90), (Aroma 3.56), (Taste 3.64), (Texture 3.50), and (Overall 3.66). Dry noodles made from MOCAF flour substitution of sacha inchi seed pulp flour with a formulation of 85% MOCAF flour and 15% sacha inchi seed pulp flour can be accepted by limited panelists and children because it has the highest value at the portion exhaust level.

The number of dry noodles made from sacha inchi seed pulp flour per 100 grams of proximate and fatty acid test results by having an average value between simplo and duplo, namely: Energy 378.06 kcal, Energy from fat 26.82 Kcal, Ash 3.215%, Water 5.995%, Carbohydrates 78.26%, Total Fat Content 2.9% Protein Content 9.55%, (Omega 3) 536.5gr (Omega 6) 795.95gr, (Omega 9) 851.15gr.

This study has some limitations that need to be noted. The number of respondents or consumers participating in a study can affect the representation of a larger population. If the sample size is too small, the results may not be generally applicable to a wider consumer population. The study may only aim to evaluate consumer acceptability and may not include other aspects such as long-term health impacts or social impacts of using these substitutions.

Suggestions for future work are that further research is needed to determine the prevalence of intestinal parasitic worm infections in the Tanjung Morawa Inpres Market area community and in future studies are expected to use more capture points so that the results of the study can describe conditions more accurately, specific to the role of flies as mechanical vectors of intestinal parasites.

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