GLUTEN FREE MOCAF DRIED NOODLE PROCESSING AS AN EFFORT TO INCREASE THE SELLING VALUE OF CASSAVA

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Abstract

Mocaf flour is flour that comes from cassava using a fermentation process. Mocaf flour can be processed into various derivative products such as cookies, sponge cake, brownies and noodles. Noodles are processed products whose main ingredient is wheat flour where wheat flour has characteristics that other flours do not have, namely being chewy and elastic due to the gluten content in the flour. The purpose of this research is to produce gluten-free mocaf noodles which are expected to increase the selling value of cassava produced by farmers. The experimental design used was a completely randomized plan with the addition of 0%: 25%: 50% and 75% tapioca flour. The noodles produced were tested for protein, fat and hedonic tests to determine the level of liking. The results showed that the addition of 37.5% mocaf flour had a protein content of 1.65% and the lowest protein content was 0.80% when using 75% mocaf. The highest fat content was 1.46% in the treatment using 25% mocaf and the lowest fat content was 1.16% when using 50% mocaf. Overall, the noodles produced were liked by the panelists with 25% mocaf usage.

Keywords: gluten free, mocaf, noodles

A. Introduction

Noodles are a processed food product that is popular with many people. Noodles are usually made from wheat flour with the addition of other permitted ingredients. Mocaf flour (Modified cassava flour) is a flour product derived from cassava which is processed using the principle of modifying cassava cells by fermentation. Cassava is one of the agricultural commodities produced in Banjarnegara district. The relatively low price of cassava causes losses at the farmer level and causes cassava farmers to replace other more promising commodities. Efforts to increase the selling value of cassava include processing cassava into mocaf flour and its derivatives. The objectives of this research to know the right composition for making non-gluten mocaf noodles, find out the nutritional content of the noodles produced and knowing the level of consumer acceptance of the noodles produced. It is hoped that the processing of mocaf flour into noodles will provide benefits, namely increased diversification of cassava-based processed food products which can raise the local potential of Banjarnegara.

B. Literature Review and Hypothesis Development

Noodles are a processed food product that is popular with many people. Noodles are usually made from wheat flour with the addition of other permitted ingredients. The main ingredient

in wheat as the main raw material for noodles is gluten which has elastic and plastic properties which cause the texture of the resulting noodles to be chewy and not break easily (Maulana, 2019). Noodles made from wheat are very dependent on raw materials that cannot be produced in Indonesia, so alternative processing of noodles has emerged by adding other ingredients as a substitute for wheat as in the research. Flour is a type of food processing that aims to reduce the size by grinding or pressing the starch in the material. Flour processing can use dry methods or wet methods (Soesilowati, Tri Martuti and Paramita, 2020). Mocaf flour is flour that is processed using different modifications compared to other cassava flour processing. The modification process that occurs in mocaf flour production is a biochemical modification process, which is carried out by adding enzymes or enzyme-producing microbes. Natural starch has several weaknesses which are indicated by the appearance of undesirable characteristics at certain pH, temperature and pressure conditions so that modification is required. Starch characteristics can be improved by modifying the starch structure (Putri, Herlina and Subagio, 2018). Mocaf flour is flour that comes from cassava using a fermentation process. The fermentation process in processing mocaf flour can use tape yeast, bread yeast, enzymes or certain bacteria. On research (Afifah Lis Apriliani and Haris Mulyadi, 2022), Mocaf flour produced by fermentation using bread flour requires a faster fermentation time than mocaf flour processed without the addition of bread yeast. The process of processing mocaf flour can also be done enzymatically by chopping the cassava into small pieces and then soaking the chopped cassava using enzymatic liquid for 1 to 3 days with the lid closed tightly (Sulistyo and Nakahara, 2015). Processing cassava flour into mocaf aims to increase the protein content in cassava. The factor that influences the high protein content in mocaf flour is the length of fermentation time required (Lutfia Dara Maretna and Rohaya, 2022).

Mocaf flour can be processed into various derivative products such as cookies, sponge cake, brownies and noodles. Noodles are a product whose main ingredient is wheat flour, where wheat flour has characteristics that other flours do not have, namely chewy and elastic due to the gluten content in the wheat (Maulana, 2019). In previous research, there have been many processing of noodles made from ingredients other than wheat flour, including in research (Gunaivi, Lubis and Aisyah, 2018) processing noodles made from taro flour. Research (Ernaningtyas, Wahjuningsih and Haryati, 2020) added carrot flour and mocaf flour to dry noodle processing. In research (Cahyani, 2018), processing noodles made from irut flour with the addition of mocaf flour where the resulting noodles have a texture that breaks easily and is less chewy. According to (Ramadhan and Sari, 2015), there is no gluten in mocaf flour. When it is processed into noodles, it will have a texture that breaks easily. Gluten is a protein found in wheat, where excess gluten is not recommended for autism sufferers. Noodles that are processed using wheat flour as a base ingredient contain gluten so they cannot be consumed by people with gluten allergies, autistic people and celiac sufferers (Kurnianto *et al.*, 2022). It is hoped that processing noodles using gluten-free mocaf flour as a basic ingredient can be consumed by gluten allergy sufferers and can increase the selling value of cassava at the farmer level. The aim of this research is to produce gluten-free mocaf noodles which are expected to increase the selling value of cassava produced by farmers.

C. **Research Method**

Research on mocaf noodle processing applies experimental research methods. The experimental design used was a completely randomized design with the addition of 0% : 25% : 50% and 75% tapioca flour. The research was carried out 7 times. The resulting noodles were tested for fat content using the Soxhlet method and protein tested using the Kjeldhal method. Next, a follow-up test was used to determine whether there were real differences between the various treatments using the DMRT test (Duncan Multiple Range Test). The preference level

test for noodles was carried out using 30 semi-trained panelists whose results were then analyzed descriptively. The test scale used in this hedonic test consists of very, very like to very, very dislike with a numerical scale of 6 – 1. The materials used in the research are raw materials for the processing process and additional materials. The raw materials used for the noodle making process in this research were mocaf flour and tapioca flour, oil, chewy, eggs and spices.

D. Discussion

Average results of fat and protein analysis of mocaf noodles as shown in table 1

Treatment of Adding Mocaf Flour (%)	Analysis Parameters	
	Fat (%)	Protein (%)
75	1.31	0.80
50	1.16	1.24
37.5	1.44	1.65
25	1.46	1.18

Figure 1. Fat and protein analysis of mocaf noodles

The results of research on the fat and protein content of the noodles produced showed that there were no real differences between treatments. The highest fat content was obtained in noodles made with a mixture of 25% mocaf flour and the lowest fat was found in noodles with 50% mocaf flour. The fat content in the noodles produced in this study was higher than in research (Sefrienda, Ariani and Fathoni, 2020). use commercial mocaf carrot noodles. The lowest protein content in noodles was obtained when using 75% mocaf and the lowest protein was found in noodles using 37.5% mocaf. The protein content in the noodles produced in this study does not comply with SNI 01-2974-1996 where the protein content in dry noodles is 11% (Nurhanifah *et al.*, 2020). The low protein content in this study is due to the characteristics of mocaf and tapioca flour which have low protein compared to noodles made from wheat flour. The noodle processing process requires flour that has a high protein content so that the resulting noodles have good breaking strength and low amylose content so that the resulting noodles will have appropriate elasticity (Umri, Nurrahman and H, 2017)

Mocaf noodles hedonic test results

Hedonic analysis of mocaf noodles as shown in table 2

Treatment of Adding Mocaf Flour (%)	Color	Aroma	Flavor	Texture	Overall
75	3.95a	3.53a	3.51a	3.65a	3.54a
50	3.96a	3.62a	3.62a	3.78a	3.82ab
37.5	4.02a	4.03a	4.23b	4.02a	4.13b
25	5.03b	4.92b	5.09c	5.18b	5.11c

Figure 2. Hedonic analysis of mocaf noodles

The results of the hedonic test carried out by the panelists on the noodles produced in terms of color, aroma, taste, texture and overall showed a real difference between treatments. Panelists in terms of color preferred noodles made using the addition of 25% mocaf flour with a score

of 5.05 (like very much). Color is one of the elements that is expected to determine the taste of the product (Apandi Ilham, Fajar Restuhadi, 2016). The more mocaf flour used in making noodles, the color of the noodles becomes browner and is less liked by the panelists. According to research (Ramadhan and Sari, 2015), the more mocaf flour used will reduce the brightness of the noodles produced. The color of the noodles is also influenced by the oven, which causes the noodles to turn brown (Satrio Wicaksono *et al.,* 2022). The color produced is influenced by the effect of heating on hydrolysis and enzymatic reactions in carbohydrates found in durian seeds and mocha flour which will convert polysaccharides into simple sugars (Rostianti *et al.,* 2018).

The aroma produced was most liked by the panelists using 25% mocaf flour with a score of 4.92 (like). The substitution of adding mocaf flour had a significant effect on the aroma of the noodles that the panelists liked. The more mocaf flour used, the more the panelists disliked the resulting noodle aroma. The aroma of a product depends on the main ingredients that make it up or the presence of additional ingredients provided in the product which are typically acceptable to the human sense of smell (Siregar and Nurminah, 2015). In terms of taste, it also shows that there is a real difference between treatments where the panelists prefer the taste of noodles using 25% mocaf with a score of 5.09 (like very much). The more mocaf that was used, the taste produced in the noodles tested was increasingly disliked by the panelists. The taste of each food product has a unique taste that differs from one to another and between one panelist and another panelist will also differ in providing a taste assessment of a product (Suprayatmi, Novidahlia and Mirdan, 2015). The texture of the noodles produced in this research also showed significant differences between treatments. Panelists preferred the noodle texture using 25% mocaf with a score of 5.18 (liked it very much). The more the mocaf noodle texture is used, the less the panelists like it. Texture is an important condition that influences the level of consumer acceptance. Texture is the condition of a product that can be observed using the mouth, namely by chewing or when bitten and swallowed, as well as the condition of the product when touched (Sari Putri and Mardesci, 2018)**.** Overall, panelists liked noodles made using the addition of 25% mocaf with a score of 5.11 (liked it very much) and the lowest noodles were liked by panelists with a score of 3.54 (somewhat liked) with the use of mocaf as much as 75%.

E. Conclusion

In making dry noodles by substituting mocaf and tapioca flour, the highest protein content with the addition of 37.5% mocaf flour had a protein content of 1.65% and the lowest protein content was 0.80% when using 75% mocaf. The highest fat content was 1.46% in the treatment using 25% mocaf and the lowest fat content was 1.16% when using 50% mocaf. Overall, the noodles produced were liked by the panelists with 25% mocaf usage. From the research results, further research is needed by adding protein to noodles.

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