

Utilization of Brown Rice as Fortification of Putu Mayang

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ABSTRACT

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In this day and age, it is very difficult to find food that is rich in nutrients and nutritious, one of the foods that is rich in nutrients can be a typical Betawi food, namely putu mayang cake. If innovated with brown rice, putu mayang cake will be more nutritious and have a lot of nutrients. As well as the nutrition and nutritional content of brown rice, putu mayang cake will look more nutritious and rich in nutrients. Experimental research on the manufacture of putu mayang involves the division of research subjects or objects into control groups and treatment groups, where the treatment group is subjected to certain treatments while the control group is not. This research aims to uncover the Utilization of Brown Rice as a Fortification of Putu Mayang. This study uses an experimental design with a variation of the addition of brown rice as an addition to fortification in the manufacture of putu mayang. This variation was carried out to determine the effect of the addition of brown rice on the fortification of putu mayang cake making. The data from the organoleptic test results include aspects of taste, color, and texture aroma with the use of brown rice flour. The power test of the level of favorability or hedonic test was carried out on the panelists, which amounted to 30 people. Based on the results of consumer acceptance, consumers accept a variety of wheat flour mixtures with different levels, this is due to the large nutritional content possessed by brown rice flour, but the taste of Putu Mayang is not so disturbed, it's just that the texture is a little hard because the more brown rice flour content is included, the less coarse the texture will be.



Introduction

Indonesia is an agrarian country that supports food availability, most of which is produced by carbohydrate sources such as cereals, and tubers (Beatrice et al., 2022). In Indonesia, cereals consist of various types such as corn, green beans, wheat, and rice. Rice is one of the main food commodities of the people in Indonesia. One type of rice found in Indonesia is brown rice (Ashraf et al., 2024).

Brown rice (*Oryza nivara*) is a rice belonging to the Poaceae family. According to Sarah, brown rice is the result of crushing brown rice into rice that is crushed without a milling process, resulting in the outer layer of the husk remaining attached to the rice (Beatrice et al., 2022). Brown rice is quite nutritious. The nutritional content of brown rice per 100g is 78g carbohydrates, 6.7g protein, 3.6g fat, 0.4g dietary fiber, vitamin B1, 41mg, vitamin B2 0.02mg, niacin 5.8mg, and minerals. Such as Ca and Fe. are 6 and 0.8

mg respectively. In addition, brown rice also contains phytochemicals in the form of red pigments called anthocyanins (Iriani et al., 2015).

Several studies have been conducted on the processing of brown rice, such as the processing of brown rice into steamed sponge cakes, baby porridge, cookies, and eaten foil (Burhan & Latief, 2023), and research on processing brown rice into flour. Brown rice flour is recommended because it is an alternative to semi-finished products, is more durable, easier to mix, can be enriched (fortified) with nutrients, and is easier to further process according to the needs of the high lifestyle of the Masu people. Practical. Flour is a solid particle in the form of fine particles produced during milling or milling (Anshori et al., 2023). By processing brown rice into flour, a type of processed brown rice product was introduced to diversify the diet.

Brown rice contains more fiber and nutrients than white rice, so it can be used as a basic ingredient for product processing. In addition, brown rice tends to be less economically cheaper than white rice, thus reducing the cost of ingredients during production. One of the benefits of brown rice is as a nutrient fortification in the manufacture of putu mayang. Brown rice contains higher nutrients than white rice. Brown rice has a higher content of iron, magnesium, calcium, zinc, crude protein, and crude fiber compared to white rice (singh Raghuvanshi et al., 2017).

In this day and age, it is very difficult to find food that is rich in nutrients and nutritious, one of the foods that is rich in nutrients is beer in the form of Betawi specialties, namely putu mayang cakes. If innovated with brown rice, putu mayang cake will be more nutritious and have a lot of nutrients. As well as the nutrition and nutritional content of brown rice, putu mayang cake will look more nutritious and rich in nutrients.

Putu mayang cake is a traditional Indonesian cake that is often eaten. This cake is made into noodles from starch or rice flour, mixed with coconut milk, and served with quinoa or liquid palm sugar. In Indonesia, putu mayang cake is part of Betawi cuisine.

Traditional Betawi cakes are starting to disappear due to the presence of modern cakes that are easier to process and more practical to consume. Although traditional cakes are not inferior to modern cakes in terms of nutritional value and price. Traditional cake ingredients are easier to find in traditional markets than modern cake ingredients. Putu Mayang cake is a typical cake of the Betawi people made from starch flour and rice flour shaped like noodles. Putu Mayang cake served with brown sugar sauce mixed with coconut milk is usually called kinca. Usually, putu mayang cakes are widely sold during the month of Ramadan.

Method

This study uses an experimental research method. The experimental research method is a research method used to test the effect of a certain treatment (treatment), as described in (Sugiyono, 2014). On the other hand, the method used in this study is to reveal the Utilization of Brown Rice as Putu Mayang Fortification. The experimental method involves dividing the subjects or objects of research into control groups and

treatment groups, where the treatment group is subjected to certain treatments while the control group is not. This research aims to uncover the Utilization of Brown Rice as a Fortification of Putu Mayang. This study uses an experimental design with a variation of the addition of brown rice as an addition to fortification in the manufacture of putu mayang. This variation was carried out to determine the effect of the addition of brown rice on the fortification of putu mayang cake making. The results of this study were obtained through analysis. The test was carried out using panelists from several groups such as lecturers, entrepreneurs, students, and the general public. The panelists gave an assessment using a questionnaire to find out the level of preference for the putu mayang cake served. The data from the organoleptic test results include aspects of taste, color, and texture aroma with the use of brown rice flour. The power test of the level of favorability or hedonic test was carried out on the panelists, which amounted to 30 people. While the variables in this study are free and bound, the free variables in this study are the use of brown rice (*Oryza Nivara*) of 50%, 75%, and 100% in the making of putu mayang cakes. The bound variable in this study is Fortification in the making of putu mayang cake (Sugiyono, 2014).

Results and Discussion

Recipe Formulation on Brown Rice in Putu Mayang Products

The formulation describes the optimal putu mayang cake with the use of brown rice as a fortification in making putu mayang (Abdullah, 2017). Here is a recipe for making brown rice as a fortification of putu mayang:

Ingredients:

1. 75g rice flour
2. 75g brown rice flour
3. 50g tapioca flour
4. 1/2 tsp salt
5. 300ml coconut milk
6. Green and red dyes

Brown sugar syrup ingredients:

1. 150g brown sugar
2. 500ml liquid coconut milk
3. 1/2 tsp garage
4. 1 pandan leaf

Steps:

1. Put the rice flour, brown rice flour, salt, and coconut milk in a cooking pot over low heat while stirring until clumpy, then remove
2. Transfer to a bowl Add tapioca flour little by little while kneading until smooth



Figure 1
Dough added tapioca flour.



Figure 2
Dough after mixing Well

3. Divide the dough into 2 parts and then add green and red dye to each dough.



Figure 3 Dough after dividing

4. Print the dough on a banana leaf that has been greased with oil



Figure 4 Dough after printing

5. Steam the dough over medium heat for approximately 15 minutes until cooked through like this



Figure 5 Dough in a steamer

6. Put brown sugar, liquid coconut milk, salt, and pandan leaves in a saucepan, and cook over medium heat until boiling



**Figure 6
Boiling Brown Sugar Dough**

7. Want brown sugar in the steamed putu mayang according to taste, and brown rice putu mayang is ready to be served



Figure 7 Putu Mayang Ready to Serve

In the use of brown rice flour, as much as 50% of the results obtained from the color aspect have shown a change from the usual color results, the taste does not taste brown rice flour, and the aroma does not smell of brown rice flour, and the texture obtained is still a little soft. To get a putu cake formula with good use of brown rice flour, it was continued with an increase in the amount of brown rice flour used by 25% of the amount of brown rice flour in the previous trial. This is intended to optimize the use of brown rice flour in putu mayang cake products. Here is a picture of putu mayang cake with 50% innovation:



**Figure 8
Putu Mayang with 50% Brown Rice Flour Innovation**

In the use of brown rice flour as much as 75%, the results obtained from the color aspect have shown a change to brownish pink, the taste is a bit brown rice flour, the aroma is a bit fragrant brown rice flour, and the texture obtained is rather soft. To optimize the use of brown rice flour in putu mayang cake products, it was continued with the addition

of 25% of the total amount of brown rice flour in the previous trial. The following is a picture of putu mayang cake with 75% brown rice innovation:



Figure 9
Putu Mayang Cake Innovation with 75% Innovation

In the use of brown rice flour as much as 100%, the results obtained from the color aspect have shown a change to brownish pink, the taste feels brown rice flour, the aroma is somewhat brown rice flour, and the texture obtained is rather soft. Based on the results of this trial, after consulting with the supervisor, the formula for brown rice flour putu mayang cake in the brown rice flour putu mayang cake research was carried out with a limit of 100% brown rice flour. The following is a picture of putu mayang cake with 100% brown rice flour innovation:



Figure 10
Results of 100% Brown Rice Innovation on Putu Mayang Cake

The difference that occurs between Putu Mayang products and Putu Mayang products is usually according to panelists or respondents that the texture of more brown

rice flour the texture tends to be rougher, and for the color aspect if more brown rice flour is used, the color will become darker, besides that in terms of taste it is not so different but for the use of more brown rice flour then for the taste it, still tastes good. Based on some, the use of more brown rice flour will add a more delicious aroma so that in more use it can produce a more delicious aroma. In terms of appearance, more use of brown rice flour, then the appearance will not affect because it still looks attractive in any form because, from a typical point of view, putu mayang cake looks attractive and unique.



Picture 11
Ordinary Rice Putu Mayang Cake

Consumer Acceptance of Brown Rice in Putu Mayang Fortification

After obtaining the standard formula for the rooftop putu cake with the use of brown rice flour, the researcher conducted further research which was a follow-up to the preliminary research which was considered feasible and acceptable to expert researchers. The use of brown rice flour as much as 50%, 75%, and 100%, in the making of putu bumbung cakes is expected to be accepted by consumers (Inke et al., 2023).

The results of the double comparison test above showed that the use of brown rice flour with a percentage of 50% (A) with 75% (B) showed a significant difference. The treatment of 50% (A) to 100% (C) showed a noticeable difference. Treating 75% (B) with 100% (C) shows a noticeable difference. It can be concluded that the use of brown rice flour with a percentage of 50% (A) is the most preferred treatment by consumers.

Utilization of Brown Rice as Fortification of Putu Mayang



(A)



(B)



(C)

Based on the results of the organoleptic test, the color of the Brown Rice Flour Putu Cake was declared acceptable and popular among consumers. Testing the hypothesis

analysis obtained that the use of brown rice flour with a ratio of 50%, 75%, and 100% will affect the color of putu mayang cake. This is because the more brown rice flour used to make putu mayang cakes, the darker the color will be. The red color comes from the epidermis which contains genes that produce anthocyanins that give it a red or purple color and also acts as an antioxidant (Ide, 2014).

Based on the results of the organoleptic test, the taste of Putu Cake with Brown Rice Flour was accepted and liked by 30 consumers. In the hypothesis analysis test, it was found that there was no effect on the taste of putu mayang cake with 50%, 75%, and 100% brown rice flour. One of the ingredients used in making putu mayang cakes is brown sugar and grated coconut which has a characteristic aroma and sweet taste so it is often used as a sweetener in making syrup and as an additive to food. The function of salt, apart from being a flavor enhancer in food, can also give rise to flavors in other food components (Pradana et al., 2016).

Based on the results of the organoleptic test, the aroma of Putu cake uses brown rice flour with a proportion of 50%, 75%, and 100% accepted and liked by consumers. Hypothesis Analysis Testing showed that the use of brown rice flour of 50%, 75%, and 100% did not affect the taste of Putu cake. This is because the aroma produced by Putu cake is distinctive. (Kadri & Rahmawati, 2015) stated that the chemical composition of pandan leaves is composed of compounds in the form of polyphenols, flavonoids, saponins, astri oils, and alkaloids so that it produces a distinctive aroma from pandan leaves covering the pieces of brown rice.

Based on the results of organoleptic tests, the texture of putu mayang cake, brown rice flour, and brown rice flour were declared acceptable and preferred by consumers. Hypothesis analysis testing showed that the use of brown rice flour affected the texture of putu mayang cakes by a ratio of 50%, 75%, and 100%. This is because it contains starch, fiber, anthocyanins, proteins, vitamins, phenols, lignin, and others (Harja, 2015). Therefore, the more proportions are used when making putu mayang cakes, the rougher the texture will be.

The following is a diagram of the average results of the questionnaire on the use of rice flour as a fortification for the manufacture of Putu Mayang:

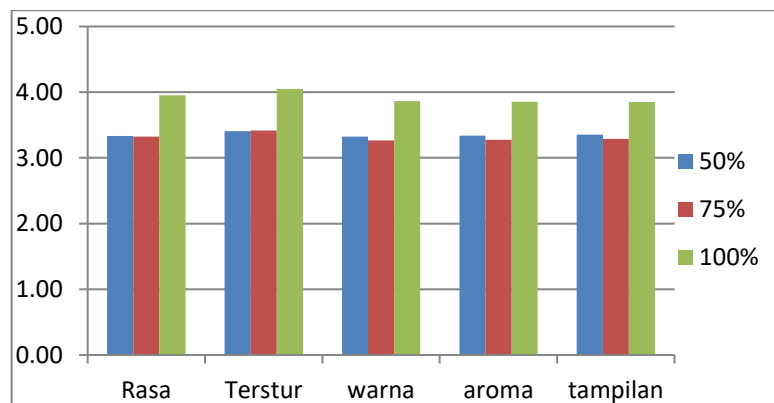


Figure 12
Average Utilization of Rice Flour as Fortification of Putu Mayang Cake

Based on the diagram above, the average has been obtained from the questionnaires that have been distributed, the use of brown rice as a fortification of Mayang putu cake in terms of taste with an addition of 50% obtained a figure of 3.34 where the taste with a content of 50% brown rice flour obtained a good taste, and the use of brown rice as a fortification of Mayang putu cake in terms of taste with an addition of 75% obtained a figure of 3.32 where the taste with a content of 75% brown rice flour obtained a good taste delicious, while with an addition of 100% the number 3.95 is obtained where the taste with a content of 100% brown rice flour acquires a good taste as well, this can be concluded that the addition of brown rice flour with a content of 50% to 100% in terms of taste will still taste good.

Furthermore, from the Texture of Putu Mayang Cake with the addition of brown rice flour by 50% with an average of 3.41 where the texture obtained a very chewy texture, and the use of brown rice as a fortification of Putu Mayang cake in terms of texture with an addition of 75% obtained the number 3.42 where the texture with a content of 75% brown rice flour obtained a chewy texture, while with an addition of 100% the number 4.05 where the taste with a content of 100% brown rice flour obtained a taste which is quite chewy, so it can be concluded that the more brown rice flour is added, the texture of the Putu Mayang cake will affect slightly.

Furthermore, in terms of color, where the addition of 50% brown rice flour obtained an average value of 3.32 with an interesting description, and the addition of brown rice flour as much as 75% obtained an average value of 3.26 with an interesting description, and with the addition of 100% brown rice flour obtained an attractive color as well so that it can be concluded that no matter how much brown rice is added to putu mayang will affect the color but it will still be attractive.

Furthermore, in terms of aroma where the addition of 50% brown rice to Putu Mayang cake obtained an average value of 3.34 meaning fragrant aroma, the addition of 75% brown rice flour obtained an average value of 3.28 with the description of the fragrance, and with the addition of 100% brown rice flour obtained an average value of 3.86 with the meaning that the aroma will still be fragrant. So it can be concluded that the aroma of putu mayang cake mixed using brown rice will not be disturbed, even the higher the amount entered, the aroma will smell fragrant.

Finally, in terms of appearance, where the average result in the addition of 50% brown rice flour in the making of putu mayang was 3.35 with interesting information, and with the addition of 75% brown rice flour obtained an average value of 3.29 with an interesting meaning and 100% of the addition of brown rice flour obtained an average of 3.85 with interesting information. So it can be concluded that the addition of brown rice flour, will not affect the appearance of Putu Mayang cake.

Conclusion

Based on the results of the research that has been carried out, the conclusions contained in this study are:

1. Based on the results of the use of brown rice flour in making Putu Mayang cakes, the best formulation for Putu Mayang cakes is to use brown rice flour in a ratio of 50%, 75%, and 100%. Descriptive data was obtained through research from the results of consumer acceptance tests including aspects of color, taste, aroma, and texture.
2. Based on the results of consumer acceptance, consumers accept a variety of wheat flour mixtures with different levels, this is due to the large nutritional content possessed by brown rice flour, but the taste of Putu Mayang is not so disturbed, it just that the texture is a little hard because the more brown rice flour content is included, the less coarse the texture will be.

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