

UTILIZATION OF BRAN FLOUR AS AN INGREDIENT IN THE PRODUCTION OF BREAD IN STPBI

Ida Bagus Soma, I Wayan Arcana
STP Bali Internasional

Abstract

Indonesia is an agricultural country where the livelihoods of the majority of the population to grow crops. Geographically Indonesia is an archipelago which also has great natural potential not only in the field of marine but also in agricultural processing. One of the results is a leading Indonesian agriculture is rice. It is not apart from the fact that rice as a staple food of Indonesia. In this study, researchers will describe the manufacturing process and the final result in the making of bread made from bran flour. Where researchers will create four kinds of bread, which is bread without flour bran as quality control (P0), white bread with a mixture of 10% flour bran (P1), white bread with a mixture of 20% flour bran (P2), and bread with 30% bran flour mixture (P3). Objects were observed in this study was to determine the final result of the manufacture of bread to test the texture, color, flavor, and aroma with a mixture of flour bran, the method of making the same, cooking equipment are the same, long fermentation time the same, the temperature of the oven the same and roasting the same time.

Keywords: bran flour, nutrition, bread, texture, color, flavor, and aroma

Introduction

Based on data released by IRRI (International Rice Research Institute) world rice production in 2007 reached 650.193 million tons. Of these 90.77% of which is contributed by the countries in Asia, or the equivalent of 590.170 million tons of rice produced by Asian agrarian country. Indonesia alone accounted for 8.77% (57.049 million tons) ranks third in the world, after China and India. Seeing these facts, we can imagine the abundance of rice produced by our farmers. But very unfortunate if the abundant production of rice in Indonesia, only rice that have economic value. Where in fact there are a byproduct of rice milling process that we can berdayagunakan into food is rice bran.

Rice milling process will produce 50% whole rice, 17% broken rice, 10% bran, groats or flour 3%, and 20% husk (Labib, 1997). Bran is the outer layer of rice that is released during the process of milling grain. Bran is generally beige or light brown. Bran or rice bran is a natural source of 100 essential nutrients that support overall health, including seven (7) components of vitamin E complex, CoQ-10, Alpha Lipoic Acid, Glutathioine, Carotenoids, Amino Acids Essential, Essential Fatty Acids, Enzymes, Phospholipids, polysaccharides, and much more.

Bran has many benefits, among them capable of inhibiting Alzheimer's, heart disease and cancer because oryzanol rice bran contains antioxidants, tocopherol, and ferulic acid. In addition bran is also believed to reduce colon cancer because the fiber is able to bind carcinogenic substances, dilutes the concentration of carcinogens exist and because transit time in the colon is short, then also reduce the large intestine exposed to carcinogenic materials.

Bread is a result of pastry products and material consisting essentially of flour / wheat, yeast / yeast, salt / salt, and water / water oven, pengembanganya process caused the yeast / yeast fermented produce CO₂ (carbon dioxide) and alcohol. Besides the above-mentioned base material can be added eggs, butter, milk, and sugar "(Subagjo, 2007: 87).

Bread is bread made from dough without using eggs with a little sugar or not at all, the use of sugar in the bread only be used to accelerate the fermentation process (Lili Noer Yulianti, 2004: 28). The texture is soft, lightweight, with a fresh taste. The reason the author chose bread is because bread is a food substitute for rice that has been familiar in all societies Indonesia. Bread has been sold in bakeries such as Breadtalk, Conato, Holland Bakery, and other bakery. Similarly in restaurants large variety of dishes sold with the basic ingredients of bread, such as club sandwiches, bread butter pudding, and so forth.

In general, the materials used to make bread is wheat flour, yeast, milk, butter, sugar, water, and salt. Wheat flour used for making bread requires only gluten contained in wheat flour (wheat). These facts reinforce the desire of researchers to conduct experiments manufacture of bread with added bran flour as raw material. The reason is because the bran is very easy to get in Indonesia. In addition, protein contained in the bran flour is high enough so as to make the bread still expanding.

In this study, researchers will describe the manufacturing process and the final result in the making of bread made from bran flour. Where researchers will create four kinds of bread, which is bread without flour bran as quality control (P0), white bread with a mixture of 10% flour bran (P1), white bread with a mixture of 20% flour bran (P2), and bread with 30% bran flour mixture (P3).

Literature Review

Nutrition of Bran

Nutrient content of white rice we eat is already very little, the main content of the rice is carbohydrates. The content of other nutrients such as fiber, vitamin B complex, protein, thiamine and niacin more contained in the bran. Rice bran also contain high saturated fats, these fats are safer in relation to kolesesterol thus safe for consumption by people with cholesterol and heart disease. Rice bran also contains tocopherols and tocotrienols which function as antioxidants that are beneficial in the prevention of various diseases including premature aging. However, in reality the existence of the bran still regarded as cattle feed and more people choose to consume white rice bran consumption and neglect. Hence today many diseases like obesity, constipation, colon cancer, hypertension,

hypercholesterolemia, and diabetes mellitus. According Rizqie Auliana (2011), the efficacy of the nutrients in rice bran are:

- a. Protein, protein is a nutrient essential for tissue growth and maintenance of tissues. Protein is needed in large quantities when the period of growth and development, during pregnancy and lactation, as well as pain. Bran protein content lower than the eggs and animal protein, but higher than soybeans, corn and wheat.
- b. As the building blocks of protein in rice bran is also more comprehensive than the rice.
- c. Vitamin B (B1, B2, B3, and B6), vitamin B vitamin that is needed by various nerve and muscle function.
- d. Unsaturated fatty acids, rice bran is also a source of essential unsaturated fatty acids. Unsaturated fatty acids beneficial to reduce the impact on the cholesterol content of atherosclerotic events.
- e. The minerals calcium and magnesium, are useful for the growth of bones and teeth.

Vitamin B15 or pangamic Acid mainly serves to help the formation of certain amino acids such as methionine.

Benefits of Bran

Various studies have shown that rice bran has a high nutritional value, containing bioactive antioxidant compounds, and rice bran fiber sacharida. The research result is quiet benefits of bran are:

- a. According Adom and Liu K R (2002) in the form of oryzanol rice bran antioxidants, tocopherol and ferulic acid, an antioxidant that is able to inhibit the incidence of diabetes, Alzheimer's disease, preventing occurrence of heart disease and cancer.
- b. According to Godber J, et al (2002) showed that the antioxidant vitamin E, especially bran and oryzanol, and saturated fat is not capable as lowering cholesterol, and contains rice bran sacharida able to prevent the incidence of cancer.
- c. According Gescher, A (2007) 51% of consumption of bran lowers the risk of bowel cancer duct adenoma.
- d. According to Method L, et al (1992) men who were given a diet containing 70 g fat, 756 mg cholesterol and 10 g of bran turned out to show a positive response in decreasing serum triglyceride levels. Constipation or constipation, bran 50 g of fiber by 44% and water by 8%, which is equivalent to 1,500 g of fresh apples containing 2% fiber and 84% water.

e. According Rizqie Auliana (2011) reduces the risk of colon cancer because the fiber is able to bind carcinogenic substances, dilutes the concentration of carcinogens exist and because transit time in the colon shorter then also reduce the large intestine exposed to carcinogenic materials.

Results and Discussion

Experiment Results

Objects were observed in this study was to determine the final result of the manufacture of bread to test the texture, color, flavor, and aroma with a mixture of flour bran, the method of making the same, cooking equipment are the same, long fermentation time the same, the temperature of the oven the same and roasting the same time.

Experiments were carried out to produce 4 (four) white bread, which is bread without flour bran (P0), white bread with a mixture of 10% flour bran (P1), white bread with a mixture of 20% flour bran (P2), and the bread with the mixture 30% bran flour (P3).

To calculate the average scores of white bread without and with bran flour mixture, must first be determined criterion score or scores ideal for the fresh bread. Ideal score = $4 \times 4 \times 5 = 80$ (4 = highest score of the answer, 4 = 4 grains instrument parameters, 5 = the number of respondents). Furthermore, the ideal score for each item instrument = $4 \times 5 = 20$ (4 highest score, 5 the number of respondents).

The first product is bread made without bran flour mixture (P0) as a control variable using a standard recipe. Control bread produced can be seen in the image below:

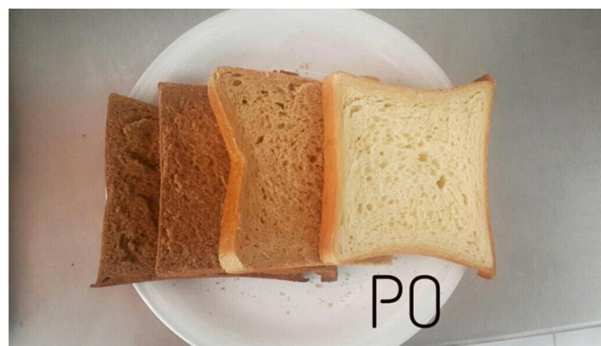


Figure 1
Fresh Bread Without Flour Mixture Bran as a Control Variable (P0)

Assessment data of 5 respondents / panelist on the test results of white bread without the bran flour mixture shown in Table 4.1 below:

Table 1
Fresh Bread Without Flour Mixture Bran

Number of Respondents	Scores for item numbers :				Total
	a	b	C	d	
1	4	4	4	4	16
2	4	3	4	4	15
3	4	4	4	4	16
4	4	4	4	4	16
5	3	4	4	4	15
Total	19	19	20	20	78

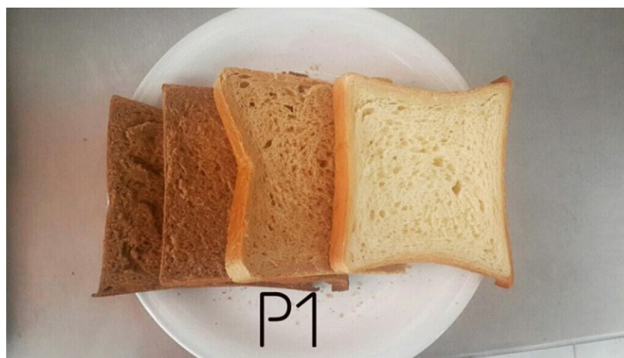
Description :

a = c = Taste Texture

b = Color d = Aroma

Based on the amount of data obtained Table 1 78. Thus, scores of white bread without flour mixture bran overall = 78: 80 = 0.975 or 97.5% of the expected criteria. When seen scores of white bread without flour mixture bran based texture = 19: 20 = 0.95 or 95% of the expected criteria. Furthermore, when viewed from the aspect of color = 19: 20 = 0.95 or 95% of the expected criteria. When viewed from the aspect sense = 20: 20 = 0.1, or 100% of the expected criteria. And when viewed from the aspect aroma = 20; 20 = 0.1, or 100% of the expected criteria. So a score of bread without flour mixture lowest bran on aspects of texture and color, ie 97.5% of the expected.

The first bread using rice bran flour mixture as many as 10% of the amount of flour used. And the results can be seen in the following figure:



Picture 2
Fresh Bread With A Mixture of 10% Rice Bran Flour

Assessment data of 5 respondents / panelist on the results of trials of bread with a mixture of 10% rice bran flour are shown in Table 4.2 below:

Table 4.2
Fresh Bread With a Mixture of 10% Rice Bran Flour

Number of Respondents	Scores for item numbers :				Total
	a	b	C	d	
1	4	4	3	4	15
2	4	4	3	3	14
3	4	4	3	4	15
4	3	4	3	4	14
5	4	4	3	3	14
Total	19	20	15	18	72

Description :

a = c = Taste Texture

b = Color d = Aroma

Based on the amount of data obtained 2 table 72. Thus, scores of white bread with a mixture of 10% overall bran flour = 72: 80 = 0.9 or 90% of the expected criteria. When seen scores of white bread with a mixture of 10% rice bran flour based texture = 19: 20 = 0.95 or 95% of the expected criteria. Furthermore, when viewed from the aspect of color = 20: 20 = 1.0, or 100% of the expected criteria. When viewed from the aspect sense = 15: 20 = 0.75 or 75% of the expected criteria. And when viewed from the aspect aroma = 18: 20 = 0.9 or 90% of the expected criteria. So a score of bread with a blend of 10% at the lowest bran flour taste aspects, namely 75% of the expected.

The second bread using rice bran flour mixture that is as much as 20% of the amount of flour used. And the results can be seen in the following figure:

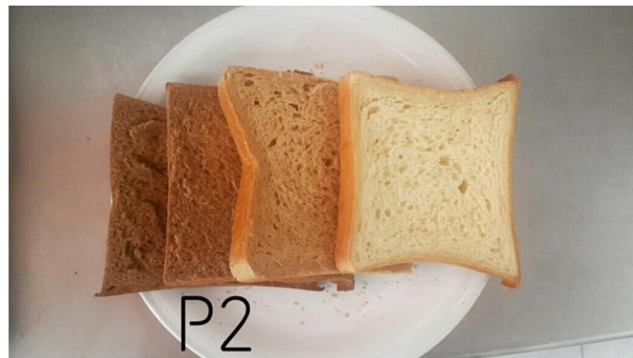


Figure 3
Fresh Bread With a Mixture of 20% Rice Bran Flour

Assessment data of 5 respondents / panelist on the results of trials of bread with bran flour mixture of 20% is shown in Table 4.3 below:

Table 3
Fresh Bread With a Mixture of 20% Rice Bran Flour

Number of Respondents	Scores for item numbers :				Total
	a	b	C	d	
1	2	2	2	2	8
2	3	3	3	3	12
3	3	3	3	3	12
4	3	3	2	3	11
5	3	3	2	2	10
Total	14	14	12	13	53

Description :

a = c = Taste Texture

b = Color d = Aroma

Based on the amount of data obtained 3 table 53. Thus, scores of white bread with a mixture of bran flour 20% overall = 53: 80 = 0.6625 or 66.25% of the expected criteria. When seen scores of white bread with a mixture of 20% rice bran flour based texture = 14: 20 = 0.7 or 70% of the expected criteria. Furthermore, when viewed from the aspect of color = 14: 20 = 0.7 or 70% of the expected criteria. When viewed from the aspect sense = 12: 20 = 0.6 or 60% of the expected criteria. And when viewed from the aspect aroma = 13: 20 = 0.65 or 65% of the expected criteria. So a score of bread with a blend of 20% at the lowest bran flour taste aspects, namely 60% of the expected.

And the third uses bread flour mixture of bran as many as 30% of the amount of flour used. And the results can be seen in the following figure:

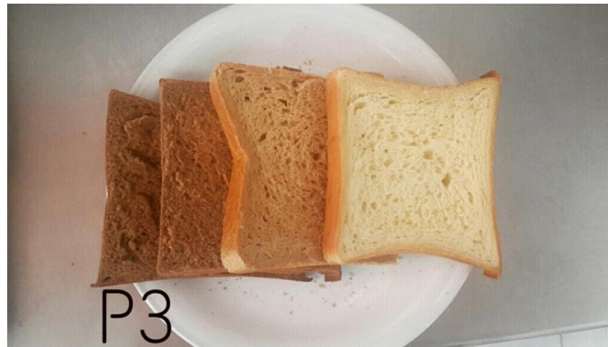


Figure 4
Fresh Bread With a Mixture of 30% Rice Bran Flour

Assessment data of 5 respondents / panelist on the results of trials of bread with a mixture of 30% rice bran flour are shown in table 4.4 below:

Table 4
Fresh Bread With a Mixture of 30% Rice Bran Flour

Number of Respondents	Scores for item numbers :				Total
	a	b	C	d	
1	3	2	3	3	11
2	3	3	1	3	10
3	4	4	3	4	15
4	3	3	3	4	13
5	2	2	1	1	6
Total	15	14	11	15	55

Description :

a = c = Taste Texture

b = Color d = Aroma

Based on the amount of data obtained 4 table 55. Thus, scores of white bread with a mixture of 30% overall bran flour = 55: 80 = 0.6875 or 68.75% of the expected criteria. When seen scores of white bread with a mixture of 30% rice bran flour based texture = 15: 20 = 0.75 or 75% of the expected criteria. Furthermore, when viewed from the aspect of color = 14: 20 = 0.7 or 70% of the expected criteria. When viewed from the aspect sense = 11: 20 = 0.55 or 55% of the expected criteria. And when viewed from the aspect aroma = 15: 20 = 0.75 or 75% of the expected criteria. So a score of bread with a blend of 30% at the lowest bran flour taste aspects, namely 55% of the expected.

Comparison of bread without flour mixture of bran and bread with a mixture of 10%, 20%, 30% bran flour are shown in table 4.5 below:

Table 5
Comparison of Bread Without Flour Mixture of Bran and Bread With a Mixture Of 10%, 20%, 30% Rice Bran Flour

P0	Parameter	P1	P2	P3
95%	Texture	95%	70%	75%
95%	Color	100%	70%	70%
100%	Taste	75%	60%	55%
100%	Aroma	90%	65%	75%
98%	Average	90%	66%	69%

Description :

P0 = fresh bread without flour mixture bran

P1 = fresh bread with a mixture of 10% rice bran flour

P2 = fresh bread with a mixture of 20% rice bran flour

P3 = fresh bread with a mixture of 30% rice bran flour

Based on Table 5 can be seen that between 3 trial manufacture of bread with bran flour mixture, can result in that bread with a mixture of 10% rice bran flour obtained the highest score. In conclusion bread with the best bran flour mixture is a mixture of 10% of the total flour used. It can be concluded that the right formula in the utilization of bran flour as an ingredient of making bread is bread with bran flour mixture with a percentage of 10% of the total flour used in terms of aspects of taste, color, aroma and texture.