

UTILIZATION OF SORGHUM FLOUR SUBSTITUTION IN CHICKEN RENDANG GYOZA SKIN

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ABSTRACT

Excess sorghum as food, feed, and the industry is rich in functional food component. The diversity of antioxidants, mineral elements, especially Fe, fiber, oligosaccharides, and b-glucan including carbohydrate component nonstarch polysakarida (NSP) contained in grain sorghum making potential as a source of functional food. The uniqueness of the sorghum is the presence of tannins and phytic acid which raised controversy negative and positive impact on health. Tannins higher antioxidant properties than vitamins E and C, as well as sorghum more stable anthocyanin antioxidants. This is the main attraction. The purpose of this study was to find a recipe substitution of sorghum flour with wheat flour for rendang chicken gyoza skin and determine the level of public acceptance of rendang chicken gyoza dish of these materials. The method used is a type of Research and Development with the concept of 4D. Dianalsis data obtained were analyzed by three methods: qualitative descriptive analysis, the chart data and percentages. Based on the research society acceptance level of the color, flavor, aroma and texture of the product gyogum (gyoza sorghum rendang chicken) was excellent.

Keywords: Sorghum, analysis, wheat flour,

INTRODUCTION

Indonesia is an agricultural country. A wide variety of plants can flourish in the land of Indonesia, such as grains and nuts. Each region has its basic foodstuffs respectively, so that many emerging grain crops in the ground in Indonesia. Grains also provide the primary energy source for humans and animals.

However, the use of grains is not maximized. Though the benefits of very large grains for human health.

Sorghum (*Sorghum bicolor* L. Moench) is an important food crop fifth after rice, wheat, corn, and barley, and become the main food of more than 750 million people in the semi-arid tropical regions in Africa, Asia, and Latin America (FSD 2003, Reddy et al., 2007). In Africa, grain sorghum is consumed in the form of processed bread, porridge, drinks, popcorn, and chips (Dicko et al. 2006a). In Indonesia the sorghum is

food cereal crops to three after rice and maize. Although the potential of sorghum in Indonesia is quite large with diverse varieties, either local or introduction, but its development is not easy. Many of the problems faced by including social, cultural, and psychological where rice is a prestigious food (superior food) being less prestigious sorghum (inferior food), while wheat is imported food which is very prestigious. Sorghum is a food companion of rice that have a comparative advantage over other cereals such as maize, wheat, and rice.

The use of sorghum as a mixture in the manufacture of food in Indonesia has not been done. To improve the usability of sorghum as a food source, please note the maximum limit of the addition of sorghum flour into the dough, so that they can produce refined products with good quality (Mudjisihono 1994; Suarni and Zakir 2000; Suarni and Patong 2002).

Japanese and Korean food trend started demanding children, one of whom is gyoza. Gyoza is a kind of dimsum hakau served with dipping sauce, have tended to salty savory flavors that appeal to kids (Kesuma et al., 2015). In addition, the gyoza a healthy snack because it contains protein, vitamins, and minerals contained in the stuffing, as well as energy and carbohydrates on the skin of gyoza (Permatasari, 2017). On the other side of gyoza are also easily innovated, by substituting the base material gyoza with local food that has a high nutritional value but is rarely used for processed food ingredients. Parents can be creative to make children's food from the local food of the area around the residence and preferably contains high nutritional value that is processed into ready-to-eat foods (Regulation 2011). Local food that could potentially be a substitute material gyoza among which the sorghum flour.

In order to facilitate one of the problems that exist in Indonesia, the purpose of the research manufacture Product Innovation Boga is to create foods that contain nutrients derived from cereals, this proposal took the initiative to innovate on food gyoza chicken rendang are made from sorghum and has a stuffing poultry seasoning rendang.

Sorghum basic nutrients not much different from other cereals. In general, the higher the protein content of corn sorghum, brown rice, and millet, but lower than wheat. Sorghum fat content higher than brown rice, wheat, barley, and lower than corn. The nutritional content of sorghum compared with other cereals are presented in Table 1.

Table 1. Composition of nutrients sorghum and other cereals (per 100 g).

commodities	Ash (G)	Fat (G)	protein (G)
buckwheat	1.6	3.1	10.4
broken rice skin	1.3	2.7	7.9
Corn	1.2	4.6	9.2
Wheat	1.6	2.0	11.6
Millet	2.6	1.5	7.7

commodities	Karbo hydrate (G)	Fiber rude (G)	Energy (Kcal)
buckwheat	70.7	2.0	329
broken rice skin	76.0	1.0	362
Corn	73.0	2.8	358
Wheat	71.0	2.0	342
Millet	72.6	3.6	336

Source: Directorate of Nutrition, Dep. Kes. RI (1992)

In general, higher protein than corn sorghum, rice and millet but still under wheat. Sorghum contains 3.1% fat, while 2% wheat, brown rice, 2.7%, 4.6% and corn. Sorghum fat consists of three fractions, namely fraction of neutral (86.2%), glycolipids (3.1, and phospholipids (0.7%). Some of the varieties and strains of sorghum was evaluated the nutritional composition and levels of taninnya served basis (Table 2).

In addition to the high carbohydrate, sorghum also contain other nutrients sufficient as a food ingredient. Superior local varieties of South Sulawesi among others Tojeng Spell Batara, Batara Tojeng Bae, Local Jeneponto, and Manggarai / Selayar. Kawali and Numbu specifically for food is a product of superior varieties of Agricultural Research. Tannin levels relatively high compared to local varieties of varieties / lines more in the range of 3.67 to 10.60%, while the varieties Kawali and Numbu each only 1.08 and 0.95%.

METHOD

In the present study, the researchers developed a product with utilization of sorghum into rendang chicken gyoza product quality. To achieve the study required a good development methods, models of research and product development (Research & Development). The research model 4D is an abbreviation of the fourth stage of the research that is Define, Design, development and Dissemination.

Product research process of the testing process recipe development, repair and create the final product is done in the laboratory of the Department of Education Boga Boga and Clothing Engineering, Faculty of Engineering, University of Yogyakarta. The process of making the product of the testing process recipe development, repair and create the final product is done within 4 months from January 2019 until May 2019.

Data collection methods used in this study is the product acceptance test methods to consumers. Acceptance test is intended to determine the level of consumer acceptance of a product that has been tested to the consumer. The admission test to the students tested PTBB catering department by providing sample of the product and give accreditation forms to the product acceptance test panelists to be filled according to the comments of each panelist to the product with a new formula that uses local food sorghum flour as an ingredient used in the study. Criteria assessed panelists namely aroma, flavor, texture, color and appearance. Products tested

ie reception implemented with the main objective of FT UNY students PTBB Hospitality Programs and test as many as 30-40 people

reception held during the exhibition of the final project with the target as many as 80 people.

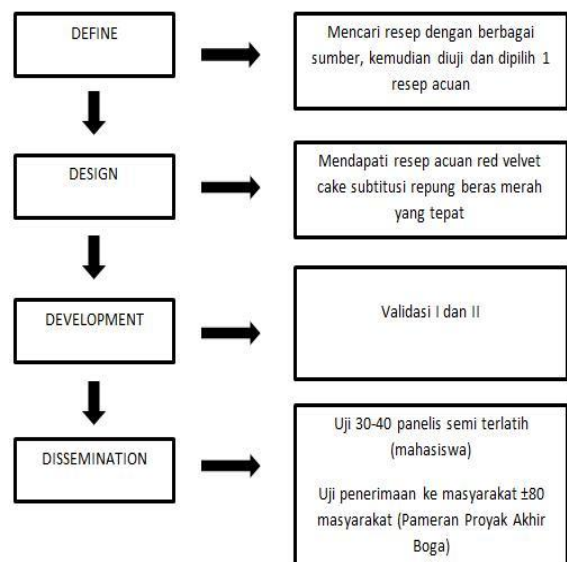


Figure 1. Flow Chart Types of Research

The technique used to analyze the data using descriptive research shows the level of explanation is to ask an independent variable (not linked and compared). Berikur is the source of the data used. In this study, researchers used beberapa panelist as a data source. Panelists provide an assessment of the color, aroma, flavor, texture and preference for rendang chicken gyoza products. Source of the data presented in Table 4.

Table 2. Data Sources

The research phase	Data source	total
Product trials to-1 (Validation I)	Expert	2 persons
Product trials to-2 (Validation II)	Expert	2 persons
test A	panelists semi trained	minimal 30 people
Disseminate: exhibition	visitor exhibition	minimal 60 people

Instrument testing in this study using 3 accreditation forms, the first is borang experiments where researchers choose one recipe benchmark of 3 prescriptions in ujicobakan to the expert. Both borang validation I and II. The third is a test borang trained panelists and the public reception at the exhibition.

RESULTS AND DISCUSSION

RESULTS

stages *define* or defining.

In keeping with the development of product quality in order to remain in accordance with the characteristics of standard products, the development of product formula should still use a standard recipe acan as controls. In gyogum product processing (gyoza sorghum chicken rendang) is used recipes from sources that have been studied, and compared with other formulas to determine the standard formula.

Table 3. Reference Recipes gyoza

material	total
Wheat flour	150 gr
tapioca starch	15 gr
Hot water	90 ml
Minced chicken	250 gr
Cooking oil	15 ml
Oyster sauce	10 ml
Sesame oil	8 ml
Cabbage	50 ounces
Salt	8 g

Source: doyanresep.com

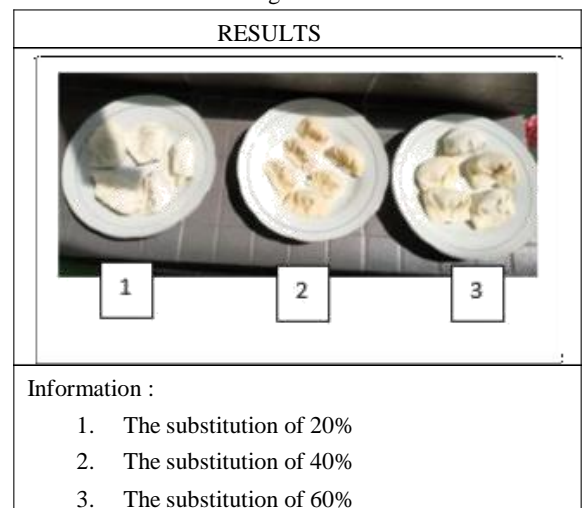
Selection 1 reference recipe is because the results of the tested produce characteristics in accordance with the wishes of consumers.

The first stage or define generating a reference recipe and then during the design phase. this stage develop a reference recipes with the substitution of sorghum flour. Recipe of reference will be substituted with a phased manner with the lowest percentage is then raised to obtain the percentage with a positive reception by the panelists. Panelists appointed supervisor is to vote on borang experiments that have been provided and then proceed with the follow-up responses from the panelists

Table 4. Recipe substitution gyoza

Bahan	Resep Acuan	Jumlah		
		Resep I (20%)	Resep II (40%)	Resep III (60%)
Tepung sorgum	-	30 gr	60 gr	90 gr
Tepung terigu	150 gr	120 gr	90 gr	60 gr
Daging ayam	250 gr	250 gr	250 gr	250 gr
Kelapa Parut	25 gr	25 gr	25 gr	25 gr
Minyak Goreng	10 gr	10 gr	10 gr	10 gr
Santan	25 lt	25 lt	25 lt	25 lt
Garam	5 gr	5 gr	5 gr	5 gr
Cengkeh	1 btr	1 btr	1 btr	1 btr
Kayu manis	½ cm	½ cm	½ cm	½ cm
Asam kandis	½ btr	½ btr	½ btr	½ btr
Bawang merah	3 btr	3 btr	3 btr	3 btr
Bawang putih	2 btr	2 btr	2 btr	2 btr
Cabai merah	5 buah	5 buah	5 buah	5 buah
Kemiri	1 buah	1 buah	1 buah	1 buah
Pala bubuk	3 gr	3 gr	3 gr	3 gr
Serai	1 btg	1 btg	1 btg	1 btg

Figure 2. Results of substitution of wheat flour and sorghum



Based on an existing table above, the discovery of the exact recipe starts from the lowest percentage, namely 20% proceed to the higher figure.

In this development activity is done by making products that have been developed and then tested to some semi-trained panelists as students who have been through the eye kuliat Food Quality Control as well as several experts or lecturers who are experts in the field of culinary criticism and suggestions are accommodated useful for improving recipes and improvements before the final step, namely dissemination. The results of this testing done in 2 stages of validation that I and Validation Validation II. The testing process

includes the manufacture of products, product testing by the two experts, the processing of the data analysis of test results, and then do the repair products. This activity is carried out by experts in the appropriate field with the product developed.

Table 5. Prescription substitution gyoza sorghum flour 20%

material	Recipe
sorghum	30 gr
Wheat flour	120 gr
Chicken meat	250 gr
Grated coconut	25 gr
Cooking oil	10 gr
Coconut milk	25 lt
Salt	5 g
Clove	1 Btr
Cinnamon	½ cm
acid kandis	½ Btr
Red onion	3 Btr
Garlic	2 Btr
Red chili pepper	5 pieces
Candlenut	1 piece
nutmeg	3 g
Serai	1 stalk

The next stage of development Development testing is also conducted product trials or activities performed on the target real objects. Development activities carried out by making products which have been substituted and through validation II then test them to the semi-trained panelist were 30 students who have taken the course of Food Quality Control as well as expert or lecturers are experts in the field of catering. Here is the documentation of test panelists atmosphere that has been done on the day Wednesday, March 27, 2019.

The summary of the test results semi-trained panelists who were 30 students can be seen in the following chart

Table 6. Test Results Semi Trained Panelist passions

characteristics	Control	Developm ent	P Value T test
Color	3.3	3.37	0.37
aroma	3.4	3.54	0.11
Texture	3.1	3.6	0.41
flavor	3.2	3.27	0.1
Whole	3.3	3.44	0.11

Based on the results of the above table, it can be seen that the level of acceptance on prodak gyoza chicken rendang with the substitution of sorghum flour can be received by the students for the control and development did not differ significantly and where the character color reaches 3:37, the fragrance reached 3:54, the texture reaches 3.6,

flavor reaches 3:27 and totaled 3:44 in comparison with the reference product. so it can be concluded that rendang chicken gyoza products from sorghum flour can be accepted by both the panelists because it is more than the value of 3 (three). Researchers can proceed to the next stage of the exhibition of products by fixing a few things on the advice of a semi-trained panelists were written on borang testing.

Next is the judging process carried out by three judges to assess characteristics such as flavor, taste, teksur, and color. The assessment is to get the value of the products that have been tried by a jury. Judging was held on Saturday, March 23, 2019 and located at 209 A and 209 B.

Dissemination is the last stage of this research model. This phase is often called the stage of dissemination or publication to test public acceptance. The test is performed simultaneously with the whole force in 2016 and Mechanical Engineering Education Boga Boga who held on Thursday, April 25, 2019 in the auditorium of UNY. Just as in the development stage, at this stage also be measured achievement of goals. Testing is done by spreading the accreditation forms for visitors who have tried the product.

Other dissemination is by making a booklet for distribution keada society. So that people more easily get a recipe that has been investigated. Organization of exhibitions as well as publications to introduce new products to the general public on the use of sorghum flour.

In the exhibition gyogum presented and packaged products as possible to attract the interest and attention of visitors. With organized exhibition of products, we can know the level of preference for product development

DISCUSSION

After testing the product A, the next stage is the exhibition. The products have been tested and have produced a recipe book and then exhibited to get assessment of the general public. Organization of exhibitions as well as publications to introduce new products to the general public on the use brown rice flour.

In the exhibition rendang chicken gyoza products are presented and packaged as possible to attract the interest and

attention of visitors. With organized exhibition of products, we can know the level of preference to product development. Exhibitors provide 80 samples of the products to be tasted by visitors. This is done to get a response from the public to the new product produced. Acceptance final assay results are presented in Table following products:

Table 7. Test Results Panelists passions Untrained

characteristics	mean Score	result
Color	3.8	be in demand
aroma	3.8	be in demand
Texture	3.8	Is preferable
flavor	3.9	Is preferable
Whole	3.9	Is preferable

Based on the above calculation, it can be seen that the level of acceptance in prodak rendang chicken gyoza with sorghum flour substitution has a color code result reached 3.8, aroma reaches 3.8, reaching 3.8 texture, flavor and overall reach 3.9 3.9. the majority of panelists like rendang chicken gyoza product substitution sorghum flour. It can be concluded that the substitution rendang chicken gyoza sorghum flour can be accepted by the public. The results of the final project exhibition dated 25 April 2019 was very good.

After the last stage of this research is to test the nutritional value of the information content. In this study goal primarily obtaining information related to the nutritional content of a product and are usually listed on the label on the packaging of a product. Testing of food nutrient content of a product is important to determine the percentage of a nutrient. testing womb nutrition using proximate analysis testing. Proximate analysis is a method of chemical analysis to identify the content of nutrients such as the amount of protein, carbohydrate, fat, ash and water. The results of the test content nutritional value of rendang chicken gyoza sorghum flour substitution is presented in the following table.

Table 8. Test Results nutrition facts

No.	Code sample	analysis	Deuterono	
			my I	repeat II
1.	gyoza	Water	36.7351%	36.5542%
	Chicken	Ash	1.0566%	1.1096%
	rendang	protein	13.3852%	13.8943%
	Substitution	Fat	13.1751%	13.0418%
	Flour	Crude fiber	11.0489%	11.2638%
	buckwheat	Carbohy drate	24.1316%	24.1361%
		Energy	271 918 cal / 100g	270.2811 cal / 100g

Based on the nutritional value information on the above it can be seen that the results of Deuteronomy I in Water reached 36.7351%, Abu 1.0566%, Protein 13.3852%, Fat 13.1751%, Crude Fiber 11.0489%, Carbohydrates 24.1316% and Energy 271 918 It can be concluded that the gyoza chicken rendang with sorghum flour substitution can be accepted by the public with the results of good nutrition so that no doubt for consumption by the public.

CONCLUSION

Based on observations, analysis and data obtained from the research manufacture of products gyoza chicken rendang with the substitution of sorghum flour, it can be concluded that the results of prescription gyoza chicken rendang with the substitution of sorghum flour that is 20% brown rice flour: 80% of wheat flour, Analysis of nutritional value information and public acceptance of the results of the acceptance test against rendang chicken gyoza with sorghum flour substitution which includes color, aroma, texture and taste was good or acceptable

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