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Porang Tubers

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ABSTRACTS

Porang tubers are plants that have many benefits and are rich sources of vitamins and protein as well as many uses for both food and as flour/main ingredient in the manufacture of foods such as cakes and noodles. However, it is unfortunate that there is still a lack of utilization of porang tubers flour as a food source. Therefore, the author made a kastangel cake with the addition of porang tuber flour to further develop the use of porang bulbs flour as a cake base and to find out the interest of the surrounding community towards the preference for products made with porang tuber ingredients. This study uses a questionnaire method with a preference test from the panelists, then the authors look for information on a good formulation to be applied to the kastangel cake before being tested on the panelists. Which later the author will record the answers of respondents from the results of the questionnaire. The author finds out the results of the study by looking for the mean, median, mode, and standard deviation data. The results are obtained by taking the average value of 4 (four) aspects, namely color, aroma, texture, taste in kastangel cake. (30% porang tuber flour 70% wheat flour) with an overall value of 38.68 consumer panelists with an average of 3.22 and for expert panelists to like kastangel cakes with formulations (30% porang tuber flour and 70% wheat flour) with the total score is 41.2 with an average of 3.22. The results of this study indicate that the use of porang tuber flour in making kastangel cake can be said to be successful with the results of the preference test which are dominated by liking.

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1. INTRODUCTION

Cookies or pastries are foods that are in great demand by the public. According to SNI 01-2973-1992, cookies are a type of biscuit made from soft dough, high in fat content, relatively crunchy when broken and solid textured. According to O'Brien (2003), the fat in cookies serves as a shortening and will affect the texture, flavor, softness, and mouthfeel. Based on the standards of the USDA (2009), cookies have a high fat content (about 20-40% of 100 g cookies). Excessive consumption of fat can cause various diseases and obesity. Obesity in various countries has had a significant impact, namely increasing mortality rates. This problem encourages efforts to make low-fat cookies by reducing the use of margarine. The basic ingredients for making cookies consist of flour with moderate levels of protein, fat, and sugar. The flour that is commonly used in making cookies is wheat. Wheat is a processed wheat product that has the largest component of starch and has gliadin and glutenin proteins that can form gluten. The gluten formed only serves to form the desired characteristics of cookies, this shows that the role of gluten in the manufacture of cookies is very small, so that substitution of wheat flour with non-wheat flour can be developed. One of the flours that can be used to replace wheat is flour based on local food. However, there are relatively few people who have no choice but to appreciate this treat, and there are even some who don't even know what sweet is. Especially sweets from Indonesia, they can't tell the difference between rolls, puddings, baked goods, chocolate, and various other types of cakes, even these cakes can't be enjoyed by everyone, because the ingredients of the food are extraordinary, but for this situation there is no strong reason to emphasize because the more the event develops, the more progress in the field of cuisine, especially this food (Mill operator, Kostogriz, and Gearon, 2009: 182). Several innovations have been carried out, of course, in terms of making desserts, from the use of flour types, sugar content and even those without sugar and of course there are also those who replace sugar with sweeteners which certainly do not have a bad impact on health, an innovation that people rarely find. is the use of flour in particular, because they believe that if some flour is accepted right, they will continue to use flour and even formulate it for centuries. Even though there is still a lot of flour that can be used or made as a food supplement, for example flour from tubers that we rarely find to make Kostogriz cakes (Mill operator, Kostogriz, and Gearon, 2009:82).

Flour is solid particles such as fine or fine grains depending on the use. Usually used for testing, and current raw materials. Djoni Wibowo (2012:34) Flour can be obtained from vegetable ingredients, such as wheat flour from wheat, starch from cassava, corn from corn or animals, such as bone supper and fish supper. Wheat flour can be used as an ingredient of choice to replace staple food sources because it has extraordinary dietary benefits, especially its sugar content. The Culinary Foundation of America (2011:11) Good quality flour has rules, specifically a slightly fine or yellowish white color, no stale odor, unpredictable, not dry when processed, no lice. As noted by (Repulse, 2010:21) Flour with insects or crawlies can be used but must be sifted first and the properties of the flour are also reduced. Low quality flour has the opposite standards, especially terrible aroma, lumps, dryness during preparation and yields when cooked in unacceptable mixtures or food varieties, for example not soft.

(Koswara, 2013:8) one option that can be used as another advance in the manufacture of desserts, especially for cake making or what we usually call kastangel is porang flour or plant flour obtained from porang tubers (Amorphophallus muelleri Blume) which contains the power of high solubility. food fiber. Its design and capacity are like gelatin, otherwise known as glucomannan. The use of porang flour in the manufacture of sans gluten has not been done much so that in this study the use of porang flour as an ingredient for making sans gluten

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chestnuts will be carried out. Porang flour is flour obtained from porang tubers (Amorphophallus muelleri Blume). Porang tubers are one type of iles-iles plant that grows wild in the forest (Rokhmah and Supriadi, 2015:13). Porang tubers enjoy the benefits due to their high fiber content, especially solvent fiber which is 64% of the dry weight so that porang tubers can meet individual needs for quality food sources with high fiber. Glucomannan substances in porang tubers can also hold water and form a gel structure in the dough (Panjaitan et al., 2017:34). Porang tubers are not good for direct consumption because they contain oxalic acid which if consumed will cause itching on the tongue. In addition, oxalic acid can also bind 3 calcium so that calcium is difficult to be absorbed by the body and causes the unavailability of calcium in the body. At high doses, oxalic acid can cause kidney stones in humans. Therefore, it is necessary to have a processing process in the manufacture of porang flour in order to reduce the levels of oxalic acid in porang tubers (Sitompul et al., 2018: 67). According to research on substitution of wheat flour with porang flour on kastangel conducted by Mahirdini and Afifah (2016: 3), the more use of porang flour will cause the chestnut texture to become not crispy and hard so that it is necessary to add other flour sources that can help improve the chestnut texture so as to produce crunchy texture. The content of glucomannan contained in porang tubers is very large, as much as 67%, so far, porang tubers are classified as foodstuffs that are relatively new, even rarely used as ingredients for making pastries, because people themselves are also lazy to use ingredients other than wheat flour or wheat flour. commonly known as wheat flour. Maybe the use of porang tubers in Indonesia itself is very rarely used and is only limited to consumption by steaming or boiling the same thing with other tubers. But as the innovation progresses, porang tubers are made into flour and even used as food ingredients, and as an alternative to wheat flour and even other flours.

Seeing this situation, the author is interested in making processed foods that use the basic ingredients of porang flour, namely making pastries (kastangel) with a mixture of porang flour and wheat flour. Porang plant can be used as an alternative flour because it contains a lot of glucomannan. In addition, konyaku porang does not contain carbohydrates and gluten, making it suitable for owners of gluten allergies, diabetics, and people who are on a low-calorie diet. There are also several advantages of this research, if successful, the results will increase the usefulness of porang tubers and porang flour, as well as introduce people who are still unfamiliar with desserts or desserts. If this product is successful, it will reduce the use of flour, prevent various diseases, and provide health impacts for the audience. Starting from the interest above, the author makes it with the title: "Substitution of Porang Flour in Making Kastengel".

1.1 **Definition of Substitution**

Substitution is grammatical cohesion. Substitution is a process Substitution is a linguistic unit. Replacement is a way to replace the initial component with a different component to convey a distinctive component or to clarify certain components (Kridalaksana, 2001: 204). Substitution has the same primary capacity as what it replaces and can be replaced by things that are understood. Substitution is a syntactic relationship and is even more a word and meaning relationship (Junaiyah and Arifin, 2010: 37).

1. 2. Definition of Kastangel

Kastangel is one type of tidbit that is popular among the general public. Kastangel is known by many people, both teenagers, teenagers and adults, who live in provincial and metropolitan areas. Kastangel is a cake that is produced using wheat flour which is mostly produced using wheat flour, cheddar, chicken eggs, margarine, cornstarch, and instant milk

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powder. The chestnut surface has a crispy surface and does not crumble as effectively as whole baked goods. The color of this chestnut is also slightly yellowish due to the influence of instant milk powder and choice of margarine (Mutmainna, 2013:10). According to SNI 01-2973-1992, kastangel is a kind of bread roll made by using a soft dough, high fat content, generally crunchy when broken and the cross section has a thick surface (BSN, 1992). Kastangel with the use of non-wheat flour is usually remembered for its short bunch mix. Kastangel then must meet the quality requirements that have been set so that it can be used as a whole, Kastangel quality requirements in Indonesia depend on the Indonesian General Norms (SNI 01-2975-1992). Kastangel can be burned at any time and is often referred to as a bite or tidbit. The principle elements of making kastangel consist of wheat flour, sugar and fat (Millah et al., 2013:33). 23 Kastangel is a cake like a small or small sweet cake. Given the important ingredients used, many chestnut mixes use a cookie cutter, but there are differences, particularly in the lesser amounts of eggs, milk and liquid. This condition works by mixing and can achieve the ideal dough thickness. Kastangel is not difficult to form and simple to put on a heating sheet (Siti Hamidah and Sutriati Purwanti, 2009: 87).

1. 3. History of Kastangel

Kastengel whose real name is kastengel, comes from Dutch, from the words kaas (cheese) and stengels (bars). So, etymologically kastengel means cheesecake bars. This cake dough consists of flour, eggs, margarine, and grated cheese. Kastengels can also be interpreted as cheese fingers which comes from the words kaas (cheese) and tengels (finger). The latter cake is shaped more like spring rolls or pastry. This cake was served in the homes of Dutch officials and employees who married native women or Dutch ladies who followed their husbands to serve in the Dutch East Indies. They are the source of acculturation of Dutch food traditions with natives. Kastengel is usually served on various holidays, from Christmas, Eid al-Fitr, to Chinese New Year. This cake is sold in cake shops, bakeries, and supermarkets in plastic jars (Indonesian chef association, 2019:1)

1. 4. Porang tubers

Porang tubers are root crops with the Latin name Amorphophallus muelleri. In certain spaces in Java, this plant is known as iles-iles. Porang is generally used to be processed into flour which is used as a modern raw material for beauty, thickeners, sticks, ramen noodles, and food mixes.

1. 5. History of Porang tubers

Porang tubers (Amorphophallus oncophyllus Prain) is a type of tuber plant. This plant is a herbaceous plant (spice) that can be found filling the tropics and subtropics (Dewanto and Purnomo, 2009:32). It has not been developed in general and is found filling wild in forests, under bamboo bunches, on riverbanks and on mountain slopes (in damp places). Porang can grow in the shade, so it is suitable to be made as an interplant between types of woody plants or trees made with an agroforestry framework. Porang development is an effort to increase food ingredients and provide modern raw materials that can increase the value of goods prices in Indonesia. Chunks of porang tubers are low in calories, so they tend to be valuable as part of a healthy eating routine. The porang tubers that are currently being circulated are still obtained from local community cultivation by collecting tubers that grow wild in plantations and forests. Currently porang tubers are used as chips as raw material so that they have a low selling value. This shows that porang tubers cannot be processed into different goods and the processing innovation has not yet developed. This paper discusses the possibility of developing porang tubers and their handling. The porang plant (Amorphophallus oncophyllus Prain) is synonymous with Amorphophallus muelleri Blume and Amorphophallus

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blumei Scott (Sumarwoto, 2005:10-14). Porang is known by several local names, depending on the area of origin such as acung or acoan oray (Sunda), kajrong (Nganjuk) (Dewanto and Purnomo, 2009:22).

1. 6 Nutritional Content of Porang tubers

Porang is a nutritious plant because it contains 45% Glucomannan, 9.7% protein, 16 types of amino acids up to 7.8%, 7 essential amino acids up to 2.5%, contains minerals, such as calcium, phosphorus, iron, zinc, manganese , copper, high in fiber, and low in calories. Porang can stimulate the absorption and digestion of protein and other substances so that the intestines remain clean and help bowel movements. This is what makes porang also known as one of the "miracle food" or "healthy food". Every 100 grams of porang tubers has the following nutritional content:

Table 1
Nutritional Content of Porang tubers

100 grams nutrition of porang tubers	
Nama	**Jumlah**
Glucomannan	50 grams
Carbohydrate	0,0004 grams
Glucose, fructose, sucrose	0,0004 grams
Phospor	57 mg
Iron	4,06 mg
Manganese	0,2 mg
Protein	1,64 grams
Fat	0,004 grams
Copper	0,08 grams

Source: Google,2021

2. METHODS

The methodology used by the author in this study is an experiment with a Completely Randomized Design (CRD) consisting of 3 treatments, through a series of trials to find a standard recipe for making kastengel using porang flour. The trial of making kastengel using porang flour was carried out repeatedly to produce a standard Kastengel recipe that looks perfect, has a good taste.

The research time is from July 2021 to September 2021. The author will conduct research in the researcher's own kitchen as a place to conduct experiments or an innovation from pre-research to research completion, where the research takes place is located at Graha Arradea Housing No.1 Rt.5 Rw.12 Jl. Ciherang people, Dramaga Kab. Bogor

3. RESULT AND DISCUSSION

The following are the conclusions from the results of the calculation of the substitution product for porang flour in making kastangel cakes.

In the manufacture of kastengel cake products with additional ingredients of porang tuber flour, conclusions were obtained in the form of questionnaire data to non-expert panelists totaling 30 panelists in the expert panelist category, using four aspects, including: color, aroma, texture, taste in 3 experimental formulations. For the color aspect, a score of 3.54 with the conclusion tends to like, the total for the aroma aspect in the 3 experimental formulations gets a score of 3.31 with the conclusion tends to like, the total aspect in the 3 experimental formulations with the texture aspect gets a score of 3 with the conclusion tends to like, the total the taste aspect in the 3 experimental formulations got a score of 3.06 with the conclusion like.

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Table 2
The conclusion of the questionnaire results of the teoung porang substitution product on the making of kastengel cake, the panelists were not experts.

Experiment	Dimensions	Total score	Mean	Median	Modus	Standard Deviation
P1	Color	3,47	3,47	3	3	0,51
	Scent	3,33	3,33	3	3	0,48
	Texture	3,63	3,63	4	3	0,49
	Flavor	3,6	3,6	4	4	0,49
P2	Color	3,63	3,63	4	4	0,49
	Scent	3,33	3,33	3	3	0,48
	Texture	3,03	3,03	3	4	0,59
	Flavor	2,9	2,9	3	3	0,30
P3	Color	3,53	3,53	4	4	0,51
	Scent	3,27	3,27	3	3	0,45
	Texture	2,26	2,26	2	2	0,52
	Flavor	2,7	2,7	3	3	0,45
Total		38,68	38,68	36	39	5,82
Average		3,22	3,22	3	3,25	0,48

Source: Data Processing Result,2021

Based on the results of the research on the kastangel cake questionnaire, the kastegel cake product with additional ingredients of porang tuber flour obtained a total of 3.2 results that were in the liking category, with the lowest indicators for the questionnaire questions being on the taste and texture aspects (P3) 2.48 while for the highest score is on the color aspect with a score of 3.53.

The results showed that the panelists were interested in the formulation of the kastangel cake by experimenting with a mixture of porang flour. Of the 3 experimental formulations in making kastangel cakes that were added with porang flour from the panelist data that had been taken, the panelists liked the product with the formulation, seen from the 3 aspects between P1, P2, P3 which were listed in the data table above.

Table 3
The conclusion of the questionnaire on the product of porang tuber flour substitution in the manufacture of kastangel cakes by expert panelists

Experiment	Dimensions	Total score	Mean	Median	Modus	Standard Deviation
P1	Color	3,8	3,8	4	4	0,45
	Scent	4	4	4	4	0
	Texture	3,8	3,8	4	4	0,44
	Flavor	4	4	4	4	0
P2	Color	3,6	3,6	4	4	0,55
	Scent	3,4	3,4	4	4	0,55
	Texture	3,4	3,4	3	3	0,55
	Flavor	3,2	3,2	3	3	0,84
P3	Color	3,6	3,6	4	4	0,55
	Scent	3,4	3,4	3	3	0,55
	Texture	2,6	2,6	3	3	0,5
	Flavor	2,4	2,4	2	2	0,55
Total		41,2	41,2	42	42	5,53
Average		3,43	3,43	3,5	3,5	0,46

Source: Data Processing Result,2021

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In the manufacture of kastengel cake products with additional ingredients of porang tuber flour, conclusions were obtained in the form of questionnaire data to non-expert panelists totaling 5 panelists in the expert panelist category, using four aspects, including: color, aroma, texture, taste in 3 experimental formulations. get a score of 3.6 with the color aspect with the conclusion tending to like, the total for the aroma aspect in the 3 experimental formulations getting a score of 3.6 with the conclusion tending to like, the total texture aspect in the 3 experimental formulations getting a score of 3.2 with the conclusion tending to like, the total aspect The taste in the 3 experimental formulations got a score of 3.2 with the conclusion like.

Based on the results of the research on the kastangel cake questionnaire, the kastegel cake product with additional ingredients of porang tuber flour obtained a total of 3.43 overall results that were in the like category, with the lowest indicators for the questionnaire questions being on the taste and texture aspects (P3) 2.5 while for the highest score is on the aspect of color and aroma with a score of 3.5.

The results showed that the panelists were interested in the formulation of the kastangel cake by experimenting with a mixture of porang flour. Of the 3 experimental formulations in making kastangel cakes that were added with porang flour from the panelist data that had been taken, the panelists liked the product with the formulation, seen from the 3 aspects between P1, P2, P3 which were listed in the data table above.

4. CONCLUSION

Based on the results of research conducted by the author with the title "Substitution of Porang Flour in Making Kastengel", the following results were obtained: The results of substitution of porang flour in making Kastengel can be used as additional ingredients. Based on the trial results of 3 formulations of making kastengel cake using porang tuber flour with different comparison scales, namely 30% porang flour and 70% wheat flour, 40% wheat flour and 60% porang flour, and 100% porang flour. It was concluded that the formulation used by the author in processing kastengel cakes made from porang flour got good results and the basic ingredients of porang flour had a lack of texture. Judging from the mean, median, mode and standard deviation values that have been obtained from the calculation results and the distribution of questionnaires to expert and non-expert panelists. For expert panelists, it can be concluded that the overall kastengel value is 41.2 with an average value of 3.43 and the most preferred is P1 (30% porang flour and 70% wheat flour) with a total score of 15.6 with an average of 3, 9. Meanwhile, for non-expert panelists, it can be concluded that the kastengel cake product has an overall value of 38.68 with an average value of 3.22 and the most preferred value is P1 (30% porang flour and 70% wheat flour) with a total value of 14, 03 with an average score of 3.5. That this product made from a mixture of porang flour is accepted with a value that is dominated by the likes category from the aspect of Color, Aroma, Texture, and Taste.

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