Chemical Characteristics of Motaf Sweet bread with Addition of Temulawak Starch

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Abstract. Bread is one of the processed foods from wheat which is widely consumed by the wider community which is used as a source of carbohydrates other than rice and noodles. In some countries, bread made from wheat flour is a staple food. Along with the development of the food industry made from wheat flour, the need for wheat flour is also increasing. So it is necessary to do efforts to find food sources other than wheat flour. In Indonesia, there are talipuk seeds which have the potential to be developed into a future source of carbohydrates and temulawak which contains quite a lot of starch. This study aims to analyze the chemical characteristics of sweet bread modified talipuk flour (motaf) with the addition of temulawak starch. This research was conducted using a completely randomized design method (CRD) which consisted of 5 treatments consisting of the ratio of wheat flour, motaf, and temulawak starch flour. The sweet bread of these 5 treatments was tested for moisture content, ash content, protein, fat, carbohydrate and crude fiber analysis. The data were analyzed using the effectiveness test. The results showed that the best treatment produced on sweet bread made from the addition of modified talipuk flour (motaf) and temulawak starch was treated with the addition of 0.01 g of temulawak starch flour. The resulting sweet bread has 19.96% moisture content, 1.01% ash content, 8.65% protein content, 13.62% fat content, 56.76% carbohydrate content, 35.19% fiber content and the value of effectiveness results. The highest is 0.39.

1. Introduction
Bread is one of the processed foods made from wheat which is widely consumed by the public which is used as a source of carbohydrates other than rice and noodles. In some countries bread is a staple food. The advantages of bread include that it is easy to consume anytime and anywhere, nutritious and can be enriched with other nutrients so that it is good for children to adults and is also available in a variety of flavors. Sweet bread is a food made from wheat flour that is fermented with yeast bread and baked. The main ingredient in making bread is using wheat flour with a high gluten or wheat protein content. Flour is the basic ingredient used in making bread in various countries including Indonesia.

Indonesia is a country that has very diverse biological resources, one of which has the potential to be used as a food source. However, Indonesia is not a wheat producing country [1], while the demand for wheat flour in Indonesia is very large every year, this imbalance between demand and availability makes Indonesia have to continue to import wheat flour. Various things have been done to reduce imports by exploring local commodity materials that can be substituted as an alternative to wheat flour, including using cassava to be processed into flour called mocaf flour [2], utilization of gadung tubers into flour [3] and utilization. seaweed into flour [4]. One of the local commodity
ingredients that can also be used as flour is from the cereal class, including lotus seeds which are called talipuk in the local language in one of the regions in Indonesia.

Talipuk is one of the plants used by the people of Hulu Sungai Utara, South Kalimantan, Indonesia as a source of food. One part that is used is talipuk seeds. Talipuk seeds can be converted into Modified Talipuk Flour (MOTAF) with high protein content and have met the Indonesian National Standard for wheat flour [5]. MOTAF can be used as a base for making various cakes, one of which is sweet bread. The research result states that MOTAF is able to substitute wheat flour by 5% in making sweet bread [1]. The sweet bread made in this research is not only from modified talipuk flour substitution (motaf) but also other ingredients added to increase the functional food value of the sweet bread, namely by adding temulawak starch flour.

Temulawak is a tuber plant that grows in tropical forest areas and has good health benefits. Temulawak also contains a large amount of starch so that it has the potential to be a commodity source of food to substitute for wheat flour, such as in the manufacture of sponge cakes that can substitute wheat flour up to 100% [6]. Based on these data, there has been no research that examines the substitution of motaf and temulawak starch in making this sweet bread and examines its chemical characteristics, it is necessary to conduct research on the chemical characteristics of sweet bread substituted for modified talipuk flour (motaf) and temulawak starch. This study aims to produce good chemical characteristics for motaf-based sweetbreads and curcuma starch so that it can be an alternative flour to substitute wheat flour from local Indonesian ingredients as a food source.

2. Method

Material

Materials used in this study were curcuma, modified Talipuk Flour (Motaf), wheat flour, chicken eggs, salt, sugar, yeast, breave improver, clean water, powdered milk, margarine.

Tools

Tools used in this study were a knife, grater, sieve, pan, scale, bowl, spoon, mixer, large basin, tray, measuring cup, brush, tongs.

3. Research Design

This research was conducted using a completely randomized design method (CRD) which consisted of 5 treatments with 3 replications. The treatment consisted of the ratio of wheat flour, motaf, and temulawak starch as shown in.

Table 1. sweet bread Motaf Temulawak

| Formulasi                | A   | B   | C   | D   | E   |
|-------------------------|-----|-----|-----|-----|-----|
| Motaf (g)               | 0   | 5   | 5   | 5   | 5   |
| Wheat flour (g)         | 100 | 95  | 94,99 | 94,94 | 94,90 |
| Temulawak starch flour (g) | 0 | 0 | 0,01 | 0,05 | 0,1 |
| Milk powder (g)         | 9   | 9   | 9   | 9   | 9   |
| Yeast (g)               | 6,6 | 6,6 | 6,6 | 6,6 | 6,6 |
| Margarine (g)           | 60  | 60  | 60  | 60  | 60  |
| Sugar (g)               | 120 | 120 | 120 | 120 | 120 |
| Bread improver (g)      | 1   | 1   | 1   | 1   | 1   |
| Egg (butir)             | 1   | 1   | 1   | 1   | 1   |
| Water (ml)              | 150 | 150 | 150 | 150 | 150 |
| Fine salt (g)           | 5   | 5   | 5   | 5   | 5   |

Sweet bread from these 5 treatments was then tested for moisture content, ash content, protein, fat, carbohydrates and crude fiber analysis. Furthermore, the data were analyzed using de garmo analysis, namely the effectiveness test.
3.1. Making of Temulawak Starch Flour
Temulawak peeled from the husk, washed thoroughly, grated then mixed with enough water and stirred until the water and grated temulawak are mixed. Then filtered using a tight sieve. Temulawak starch mixed with water is deposited, the starch that has settled is discharged and rinsed with new water while stirring to remove the sap included in the temulawak starch. Rinsing is done repeatedly until the rinse water looks clear and you get clean temulawak starch. Then discarded the last rinse water and dried the temulawak starch flour under the hot sun until dry [7].

3.2. Making Modified Talipuk Flour (Motaf)
Fermentation of talipuk seeds with the addition of tape yeast as much as 6% of the total number of talipuk seeds used. Talipuk seeds are fermented for 16 hours and covered. After the talipuk seeds have been fermented for 16 hours, the talipuk seeds are washed thoroughly. Then the talipuk seeds are dried in the sun for about 2 days until they dry out. Then the talipuk seeds are blended until smooth, then the flour is sieved using a sieve so that the resulting flour is soft and smooth. In order to produce flour that has the best quality, after sieving, the flour is dried under the sun for about 1 day [8].

3.3. Making Sweet Bread
Making bread products using the method [9] that is the first stage done by preparing starter materials such as milk, sugar, eggs and yeast. 150 ml of milk mixed with 120 grams of sugar then warmed, stirred until dissolved, and stopped heating. Put one egg in the mixture, stir until well blended, and make sure the liquid is cold, then add 6.6 grams of yeast and stir until evenly then let stand until the liquid thickens and becomes foamy (± 10 minutes). After the starter ingredients are ready, the starter is put in a 300 gram mixture of flour, motaf and temulawak starch (according to the combination of the treatment formula), 5 grams of salt and 1 gram of bread improver, then stir until well blended. margarine is 60 grams of added to the dough, then kneaded until smooth, and after being smooth, the dough is covered using plastic ureping for about 1 hour until the dough expands. The dough is then formed and left to stand in a pan that has been smeared with butter for ± 30 minutes so that the dough expands, then oven for 20 minutes at a temperature of 150 °C.

3.4. Chemical Characteristics Chemical
Test characteristics test in this study was carried out by using the proximate test, namely testing the water content [10 ], ash content [10 ], fat content [10 ], protein content [10 ], crude fiber [10 ], and analysis of carbohydrate content method by difference [11].

4. Results and Discussion
The results of the proximate analysis are as shown in the table below.

| No | Treatment | Moisture content (%) | Ash content (%) | Protein content (%) | Fat content (%) | Carbohydrate content (%) |
|----|-----------|----------------------|----------------|--------------------|----------------|-------------------------|
| 1  | K1        | 19.58 ± 0.25         | 1.01 ± 0.00    | 10.14 ± 1.92       | 14.15 ± 0.78   | 55.12 ± 0.89            |
| 2  | K2        | 20.74 ± 0.37         | 1.02 ± 0.01    | 10.89 ± 0.72       | 13.57 ± 0.01   | 53.79 ± 1.09            |
| 3  | MT1       | 19.96 ± 0.23         | 1.01 ± 0.00    | 8.65 ± 0.34        | 13.62 ± 0.08   | 56.76 ± 0.48            |
| 4  | MT2       | 20.02 ± 0.65         | 1.02 ± 0.00    | 10.09 ± 0.33       | 13.34 ± 0.36   | 55.54 ± 1.34            |
4.1. **Moisture content**
Water is an important component in food ingredients that can affect the appearance, texture, taste of food and its nutritional value [12]. The results of the analysis of water content (Table 5) showed that the more temulawak flour was added, the water content was higher (MT3: 22.85). [13] stated that water content determines the durability of a food. Food that is high in water content will spoil faster than food with low water content.

4.2. **Ash content**
Content The ash content describes the amount of minerals that are not burned into volatile substances [14]. The results of the ash content analysis (Table 5) show that there is no significant difference in the ash content of the sweet bread for each treatment even with the addition of temulawak starch flour. According to [15], ash is an inorganic mineral that has a high enough resistance to cooking temperatures so that its presence in food can change, but tends to remain.

4.3. **Protein content**
Is a source of amino acids that contain elements of C, H, O, and N which are not owned by fat or carbohydrates. Protein is a food substance that is very important for the human body, because protein functions as a fuel in the body and is also a building and regulatory material. The results of the analysis showed that the treatment of adding temulawak starch flour had decreased protein content. The low protein content in sweet bread with the addition of temulawak starch is due to the temulawak starch flour that does not contain gluten. With a low gluten content in the substituted sweet bread substituted with curcuma starch, it is hoped that it can reduce allergy symptoms in people with gluten allergy (gluten intolerance).

4.4. **Fat content**
Is a food substance that can produce energy for the human body. Functional food products must have low levels of fat, because low levels of fat can increase the effectiveness of dietary fiber in reducing cholesterol in the blood. The results of the analysis (Table 5), show that the treatment with the addition of temulawak starch flour decreased fat content, where with 100% wheat teung it was 14.15%.

4.5. **Carbohydrate content**
CarbohydrateCarbohydrates are one of the organic macromolecules composed mainly of three elements, namely carbon (C), hydrogen (H), and oxygen (O) with the general formula (CH2O) n. Carbohydrates have an important role in determining the characteristics of food ingredients, such as color, taste, texture, and so on. The results of the analysis of carbohydrate content (Table 5) indicate that the carbohydrate content of bread with the addition of temulawak starch has increased compared to K2. The increase in carbohydrate content in TPT sweet bread was due to the addition of temulawak starch. Starch is the main source of carbohydrates in food.

4.6. **Fiber content**
(fiber) can be divided into(crude fibercrude fiber) and(dietary fiberdietary fiber).(Crude fibercrude fiber) is plant / plant fiber that is insoluble in acids (H2SO4 1.25%) and alkaline (NaOH 1.25%). Crude fiber value is lower than dietary fiber because H2SO4 and NaOH have a greater ability to hydrolyze food components compared to digestive enzymes.
### Table 3. Results of Crude Fiber Analysis of Sweet Breads MOTAF Temulawak

| No. | Treatment | Crude Fiber (%) |
|-----|-----------|-----------------|
| 1   | K1        | 17.64 ± 1.61    |
| 2   | K2        | 15.64 ± 1.20    |
| 3   | MT1       | 15.10 ± 0.36    |
| 4   | MT2       | 14.44 ± 0.92    |
| 5   | MT3Dietary| 15.32 ± 1.58    |

Fiber content ranges from 2-3 times crude fiber. The main components of crude fiber are composed of cellulose, gum, hemicellulose, pectin and lignin [16]. Crude fiber content in bread with MOTAF substitution and curcuma starch flour is lower than that of 100% wheat flour. This is probably due to the fiber content in MOTAF and low-fiber Temulawak Starch.

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