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Analysis of the Nutritional Value of Seaweed (*Eucheuma Cottonii*) Mocav Noodles

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Abstract

Mocaf Flour (Modified Cassava Flour) is a flour product of yams dioses using the principle of modifying cassava cells by fermentation. This study aimed to determine the influence of seaweed and CMC additions on the organoleptic assessment of Mocaf noodles. The research design used is a Complete Randomized Design (RAL) with 6 treatments that are a combination of proportions between Mocaf flour, seaweed and CMC (Mocaf flour: wheat: seaweed: CMC) R1= 50%: 47% : 2% : 1%, R2= 50% : 45% : 4% : 1%, R3 = 50% : 43% : 6% : 1%, R4 = 50% : 41% : 8% : 1% , R5 = 60% : 29% : 10% : 1%, R6= 98% : 2%. Based on the research results, the overall nutritional value of mocav noodles is in accordance with nutritional value standards and can be industrialized.

Keywords: Mocaf; Seaweed; Nutrisional; Wet Noodles

Introduction

Instant noodles are one of the food products that are favored by the community. Generally, instant noodles on the market are processed products from wheat flour derived from wheat seeds. However, Indonesia is not a wheat-producing country. To minimize the use of wheat flour can be replaced by using MOCAF. An alternative to reduce dependence on wheat imports is to replace the role of wheat flour as the primary raw material of noodles by utilizing local cassava food (Manihot esculenta) into functional food products.

The tendencies and lifestyles of modern society demand ready meals. Food ingredients commonly consumed by the public as ready-to-eat food substitutes for rice is noodles. Noodles are generally made from wheat flour derived from wheat, and their existence still has to be imported from abroad.

Cassava (Minihot esculenta) is one of the sources of foods rich in carbohydrates. In addition, there is nutritional cardigan such as protein, vitamin C, calcium, iron, and vitamin B1, so cassava is suitable for consumption by the community. MOCAF is cassava flour that has been modified with the principle of fermentation by Lactic Acid Bacteria(BAL) [2]. Bal can produce enzymes that hydrolyze starch into sugar and convert it into organic acids, especially lactic acid. This causes a change in the characteristics of the flour produced in rising viscosity, glass ability, rehydration power, and ease of dissolving. In addition, the taste of MOCAF becomes neutral as it covers the image of cassava flavor up to 70% [3][4].

Wet noodles made from Mocaf flour with the best results are noodles with a ratio of raw materials 70% wheat flour and 30% Mocaf flour [5]. However, there are still shortcomings in the product, namely the texture of wet noodles that are still fragile, so it needs to be given other additives and increased the proportion of mocaf flour usage to 50%, which was previously only 30%. Therefore, it is necessary to use alternative foodstuffs as ingredients that can improve the texture of wet noodles with the addition of seaweed and CMC.

Seaweed (Eucheuma cottonii) is a low-level plant that has a content that plays a role in the improvement of texture is carrageenan [6][7]. With seaweed in the mixture of a wet noodle, the dough is expected to increase the fiber content in wet noodles. The coarse fibers present in seaweed in mixing noodles greatly influence the texture of noodles.

Carboxymethyl cellulose is a linear cellulose polymer ether and anion compound, biodegradable, colorless, odorless, non-toxic.

Carboxymethyl cellulose is derived from wood cellulose and cotton obtained from cellulose and monochloroacetic acid, with catalysts in alkaline compounds. Carboxymethyl cellulose is also a versatile compound that has important properties such as solubility, rheology, and adsorption on the surface. In addition to these properties, viscosity and degree of substitution are two of the most important factors of cellulose carboxymethyl, and cellulose carboxymethyl is used as a stabilizer, thickener, adhesive, and emulsifier. Based on the description, it is necessary to study the addition of seaweed and CMC to improve the texture of Mocaf noodles so that noodles are expected to be obtained from local mocaf foodstuffs that have a better texture than before and are beneficial for health.

Materials and Methods

Mocaf Flour Making

Peel the cassava skin clean the mucus on the surface of the cassava with water, and rub it into thin pieces cassava with a knife or chopping tool until shaped like chips or chips. Soak in clean water for three days. Change water every 24 hours. Remove the soak, drain. Dry the chips, moisture content 10-12%. Mash or grind dry chips. Sift with a sieve the size of mesh granules 60 or 80 [11].

Seaweed Porridge Making

Preparation of seaweed samples, based on method [12] Dried seaweed used obtained from The Village Mambulu Sampolawa Subdistrict. The preparation stage of seaweed samples conducted [12]. It starts with choosing good quality dried seaweed, then washed. Seaweed is cut into small pieces with a size of 3-5 cm. Then seaweed soaked for 10 hours to clean the dirt on seaweed, then done rinsing with

running water and slicing, then seaweed soaking with betel lime 10 g for 5 hours and drained again, for 5-6 minutes (while stirring). Then the seaweed is blended and cooked (while stirring) until the seaweed becomes porridge. Seaweed porridge must be ensured to be really smooth in order to facilitate the process of kneading and make the dough smooth.

Noodle Making

The method of making noodles refers to [13] The stages of making wet noodles consist of the mixing stage, roll press (sheet formation), steaming, noodle formation, cooling to packaging. In the first stage mocaf flour, wheat flour, seaweed pulp and CMCs are mixed then added water 25 ml, salt 1 g, and eggs 10 g. After the dough is smoothed, made a thin sheet then steamed. The sheets are then put in a noodle printer roller. The noodle strands are then boiled for 3 minutes then drained.

Research Design

The experimental design used in this study is a Complete RandomIzed Design (RAL) with 6 treatments that are a combination of proportions between Mocaf flour, seaweed porridge and CMC with a total amount of noodle dough as much as 100 grams and each treatment repeated 4 times so that 24 experimental units were obtained. The treatment is as follows: R1= Mocaf flour 50 g: wheat flour 47 g: seaweed porridge 2 g: CMC 1 g, R2= Mocaf flour 50g: wheat flour 45 g : seaweed porridge 4 g : CMC 1 g, R3 = Mocaf flour 50 g : wheat flour 43 g : seaweed porridge 6 g : CMC 1 g, R4= Mocaf flour 60 g : wheat flour 41 g : seaweed porridge 8 g : CMC 1 g, R5= Mocaf flour 50 g: wheat flour 39 g: seaweed porridge 10g: CMC 1g and R6= wheat flour 98 g: seaweed porridge 2 g.

Data Processing

The data obtained in this study was analyzed using SPSS 2016 One Way Anova to assess the panelist's acceptance of organoleptics and Mocaf noodles covering color, texture, taste and aroma, obtained organoleptic assessment that has a very real effect on observation variables then continued with Duncan's Multiple Range Test (DMRT) at a confidence level of 95% (α=0.05).

Results and Discussion

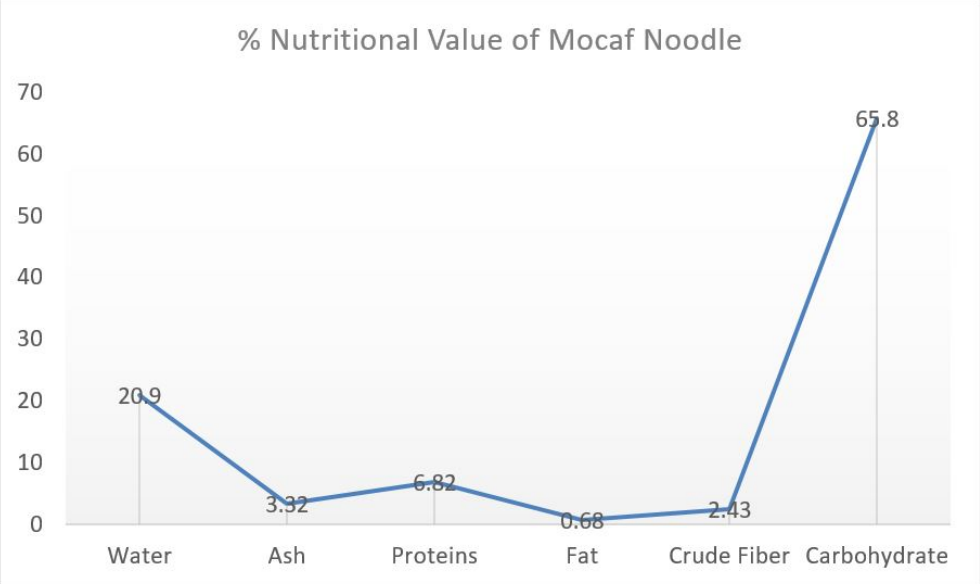

Figure 1: Nutriotion Value of Mocaf Noodle

Discussion

The water content in the Mocaf noodle product added seaweed porridge R4 = 50%: 41%: 8%: 1% by 20.90%. The water content of Mocaf noodle products with the addition of seaweed pulp is in accordance with the Indonesian National Standard (SNI). The National Standardization Agency (1992), showed that dry noodles made from 100% wheat flour had a water content of 23.10%. With a moisture content of 20.90 mocav noodles, the quality of the noodles produced is good and it is suspected that they will last longer. This is supported by Winarno (2004), which states that water loss or increased water content is an important factor in determining the shelf life of food products.

The ash content in Mocaf noodle products by adding seaweed slurry R4 = 50%: 41%: 8%: 1% yields 3.32%. The ash content of the resulting noodle products still meets the SNI criteria, namely a maximum of 3% wb. Based on Wirdayanti's research (2013), it shows that the ash content of purple sweet potato noodles made from 55% wheat flour with steamed sweet potatoes has an ash content of 1.18%, while 100% wheat noodles has an ash content of 1.04%. Ash is an inorganic substance from the combustion of an organic material.

According to Winarno (2004), protein is an important food substance for the human body, because it functions as fuel in the body and also as a building material and regulator. The protein content in Mocaf noodle products by adding seaweed porridge R4 = 50%: 41%: 8%: 1% is 6.82%. The decrease in noodle protein is due to the low mocaf protein, but the high-temperature heating process causes damage to the protein structure, so that there is little intact protein (Pratama, et., Al 2002).

The fat content in Mocaf noodle products by adding seaweed porridge R4 = 50%: 41%: 8%: 1% is 0.68%. The noodles produced in this study had a soft texture and the panelists liked the taste. Like carbohydrates, fat is a source of energy for the body which can provide a greater energy value than carbohydrates and protein, namely 9 kcal/g (Kurtzweil, 2006).

Based on Wirdayanti's research (2013), showed that the fat content of sweet potato noodles with a ratio of wheat flour and steamed sweet potatoes had a fat content of 2.82 (%bb), while the control wet noodles from wheat flour had a fat content of 3.62 (%bb)). Fat serves as a source of flavor and gives the product a soft texture. The fat content in the resulting wet noodle product is obtained from oil and egg yolks.

The results of research on the crude fiber of Mocaf noodle products added seaweed porridge R4 = 50%: 41%: 8%: 1% by 2.43% in accordance with the Indonesian National Standard (SNI). This is because mocaf has a higher crude fiber content than wheat flour. Based on Wirdayanti's research (2013), showed that the crude fiber from purple sweet potato noodles with a ratio of wheat flour and steamed sweet potatoes had a crude fiber of 1.10 (%bb), while the control wet noodles from wheat flour had a crude fiber of 1.01 (% bb).

Carbohydrate content in the Mocaf noodle product with the addition of seaweed porridge R4 = 50%: 41%: 8%: 1% is 65.8%. Likewise, purple yam has high anti-oxidants. Apart from vitamins A, C and E, mocaf also contains vitamin B6 (pyridoxine) which plays an important role in supporting the body's immunity. Mocaf has an amylose content of 34.75%, while wheat has an amylose content of 29.78%. In addition, mocaf has a high amylopectin content compared to wheat, which is 39.55% and wheat flour is 33.74%. so that the swelling power of mocaf is higher than wheat.

Conclusion

Based on the results of the study can be concluded that the addition of seaweed porridge and CMC has a very real effect on the nutrition assessment of the texture of mocaf wet noodle products and selected formulations on the R4 treatment.

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