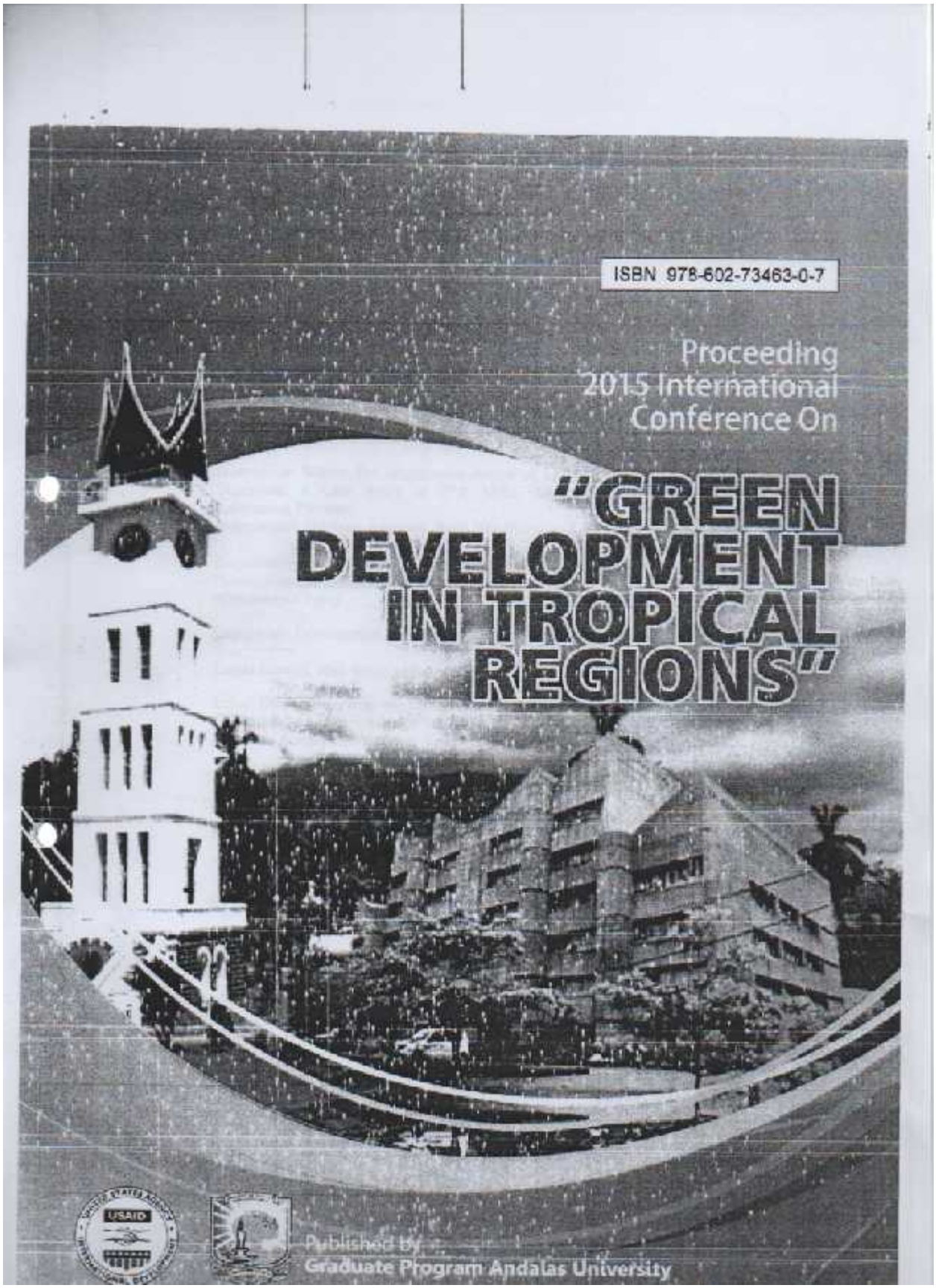
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APPLICATION OF SAGO (*METROXYLON SAGO ROTTB*) AS SUBSTITUTION MATERIALS OF WHEAT FLOUR IN THE MAKING OF NOODLE

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ABSTRACT

The increasing of wheat consumption is necessary to considerthe local food materials as substitution material. Sago is the potential local food that used as alternative material ana rich of carbohydrate. This material can be used as substitution material of wheat in the making of noodles. However, the right amount of sago as substitution material of wheat in the making of noodle is unknowns.The purpose of study was to obtain the right amount of sago flour as substitution material of wheat in the making of noodle. The study was conducted on 6 percentages of sagoflour as substitution of wheat (0%, 10%, 20%, 30%, 40% and 50% of sago flour). The best percentage was determined based on quality of noodle by using organoleptic test. The results show that addition 40% of sago flour was the best percentagean substitution material of wheat in the making of noodle. On this amount, the noodle had a good taste, color, aroma, and texture. From the proximate analysis, the noodles with 40% of sago also had a good value in water content, ash, protein, fat, carbohydrate, and less in micra-bacterial content.

Keywords: *noodle, substitution, sago, wheat*

INTRODUCTION

Noodles is one of the food products that have been popular and is favored by various circles of society. In Indonesia, noodles favored people as a substitute for rice because it tastes good, practical and cheap. Noodles made from wheat flour with the addition of additives each of has a different function and effect. Additional materials used are salt, water, baking soda or sodium carbonate (Astawan, 2003).

Noodle industry is an industry that quite a lot of utilizes of wheat flour. The needs of wheat flour in Indonesia are very high. At 2012 wheat imports has exceeded 6.3 million tons. From these data it is known that the use of wheat flour is quite an important role as an indicator to see the development of food consumption instead of rice. However, to reduce our dependence on wheat flour because wheat flour prices continuing rise and it is aggravating the country, so there needs to utilization of local resources.

One of the local food of potential to be developed is sago. Sago (*Metroxylon sago Rottb*) rich in carbohydrates with a high amount of starch content (85.76%) [2]. So far the utilization of sago flour still need to be developed so that its utilization in processed food products as a diversification of food, such as substitute material in the manufacture of noodles. To see a good level of substitution in making sago noodles, it is necessary to studies that can support the quality of sago noodles which qualified SNI.

MATERIALS AND METHODS

Materials and instruments

The materials used in this study were wheat flour, tapioca starch, sago flour, eggs, salt, water, cooking oil, selenium, sulfuric acid, NaOH 30%, conway indicator, sulfuric acid 0.025 N, cotton, petereleum benzene, filter, alcohol 80%, NaOH 45%, distilled water, HCl 25%, APDA and PCA.

The instruments used in this study were noodles processing tools, basin, stove, pot, scales, pan, test tubes, petridish, incubators, steamer, blender, mixer, burette, erlemeyer, pipette, beaker, water bath, measuring cups, spatulas, furnaces, flask, plates, cups and spoons, flask Kejldahl, distillation equipment, Soxchlet, oven and desiccator.

Work Methods

The method used is to find the best treatment by organoleptic test of sago noodles. Each treatment were as follows:

A. Without sago flour (control)
B. substitution of sago flour 10%
C. substitution of sago flour 20%
D. substitution of sago flour 30%
E. substitution of sago flour 40%
F. substitution of sago flour 50%

Research implementation

Preparation of materials

Table 1. The materials prepared and weighed according to the formulation

No.	Materials	Amount
1	High protein wheat flour (g)	700
2	Sago flour (g)	(moving according to treatment)
3	Tapioca flour (g)	appropriate treatment
4	Whiting (g)	100
5	Salt (g)	15
6	Baking soda (g)	10
7	Ashes water (ml)	15
8	Eggs	60
9	Cooking oil (ml)	2
10		100

Processing of sago noodles

The stages of processing sago noodles were mixing of the materials, dough sheeting, molding noodles, boiling, draining and lubrication with cooking oil

Packaging

Sago noodles was packaged in plastic packaging and then sealed by plastic sealer.

Quality assessment

Quality assessments of sagoo noodles were organoleptic test such as colour, aroma, flavour and textur of sago noodles. the best treatment will be carried proximate analysis (moisture content, protein content, fat content, ash content and carbohydrate) and microbiology to wet sago noodles and dry sago noodles.

RESULT AND DISCUSSION

Organoleptic Test

Wet sago noodles organoleptic test was conducted on 20 panelists with hedonic method. Organoleptic mi sago generally preferred by consumers especially 40% substitution of sago flour. Based on the results of organoleptic tests, sago noodles have beige color, characteristic aroma and the texture quite chewy. The organoleptic test results of wet sago noodles are shown in Table 2.

Table 2. The organoleptic test of the best treatment (40% substitution of sago flour)

Parameter	Value
Colour	3.75
Flavor	3.55
Aroma	3.85
Texture	3.75

Description: 1 = very unpreferred, 2 = unpreferred, 3 = ordinary, 4 = preferred, 5 = very preferred

Proximate Analysis sago noodles

Noodles with the best treatment will be proximate analysis includes the analysis of water content, protein content, fat content, ash content, and the calculation of carbohydrates. proximate analysis conducted on wet sago noodles and dry sago noodles. the result of proximate analysis wet sago noodles were shown in Table 3 and the results of proximate analysis dried sago noodles were shown in Table 3.

Table 3. Proximate analysis sago noodles

Analysis	Wet sago noodles	Dried sago noodles
Moisture content (%)	58.83	7.79
protein content (%)	10.44	11.22
fat content (%)	0.30	1.65
Ash content (%)	1.17	2.97
Carbohydrates (%)	32.48	77.15

The moisture content of dried sago noodles obtained 7.79%. The moisture content of dried sago noodles complies with the requirements of Standar Nasional Indonesia (SNI). The quality requirements of dried noodles according to SNI 01-2974-1992 for moisture content quality I was maximum 8%. As compared with the sago wet noodle, moisture content of dried sago noodle was much smaller, it is caused the drying process by using thermal energy. With this small moisture content, dried sago noodle can be stored for a long time because microbes can not be grown.

Protein content of wet sago noodles obtained 10.44%. Protein content of wet sago noodles complies with the requirements of SNI. Quality requirements according to SNI 01-2987-1992 for protein content of wet noodle at least 3%. As compared to dried sago noodles, protein content of dried sago noodles sago noodles obtained 11.22%. The protein content of dried sago noodles also complies with the requirements of SNI. The quality requirements of dried noodles according to SNI 01-2974-1992 for protein content of quality I minimum 11%. This is caused a reduction in the moisture content by the heat during the drying process. fat content of wet sago noodles obtained 0.3% and fat content of dried sago noodles obtained 1.65%. This is caused a reduction in the moisture content by the heat during the drying process.Ash content of wet sago noodles abtained 1.17% and ash content of dried sago noodles obtained 2.97%. Ash content shows mineral content of materials.The carbohydrate content of sago noodles was calculated based on the Carbohydrate by Different method. Carbohydrate content of wet sago noodles obtained 32.48% and the carbohydrate content of dried sago noodles obtainained 77.15%.

Microbiology Test

The result of microbiologi test sago noodles were shown in Table 4.

Table 4. Microbiology test of sago noodles

Sago Noodles	Total Plate Count Koloni/g	Total of Fungi and Yeast Koloni/g
Wet sago noodles	1.16×10^5	5.1×10^4
Dried sago noodles	$<3.0 \times 10^4$ (2.3×10^3)	0

The results of total plate count wet sago noodles obtained 1.16×10^5 koloni/g and total fungi and yeast 5.1×10^4. The results of total plate count dried

sago noodles obtained <3,0 x 10^4 (2,3x10^6) koloni/g and and there was no fungi and yeasts are grown. The result of microbiology sago noodles complies with the requirements of SNI Quality requirements according to SNI 01-2987-1992 and SNI 01-2974-1992 for Total Plate Count maximum 1.0 x 10^6

CONCLUSION

Sago can be used as substitution material of wheat flour in the making of noodles. The noodles with 40% of sago flour was the best percentagest substitution material of wheat in the making of noodle. wet sago noodles and dried sago noodles have good characteristics and accordance with the requirements of the Standar Nasional Indonesia (SNI).

REFERENCES

Astawan, M. 2003. Membuat Mie dan Bihun. Penerbit Swadaya. Jakarta.
Safii. I. 2005. Pembuatan Tepung Sagu. Institut Pertanian Bogor, Bogor.