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Consumers Preferences to Sweet Potato Flakes (Spf) from Sweet Potato Pasta as A Raw Material, with Enrichment Mung Bean Flour as Source Protein

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***Abstract*—Sweet potato flakes as an alternative food and a source of carbohydrates as breakfast cereals food. To meet the nutritional needs of sweet potato flakes contained in the primarily source of protein. The purpose of the research was a source of enrichment of protein contained in sweet potato flakes (SPF) with the addition of mung bean flour. And to get an optimal result of consumer preferences with the addition of mung bean flour optimal still be accepted by consumers based on organoleptic test. This study consists of several stages, namely the stage of making sweet potato pasta base material, formulation, manufacture flakes and organoleptic product. Experimental design using a completely randomized design, 5 treatment composition of sweet potato pasta and mung bean flour were (95 : 5%), (90 : 10%),(85 : 15%),(80: 20%) and(75: 25%) with 3 replications. The best formula will be determined by organoleptic and physical and chemical analysis. Data were collected for chroma color, moisture content, proximat, crispness (texture) and resistance crisp during the presentation of the milk solution. Sweet potato flakes was getting a balanced nutritional content and better nutrional content after enrichment with mung bean flour protein content Sweet potato flakes which become water content 5.6713% - 6.2435%, ash content 2.7501% - 3.0858%, 4.4765% protein content up to 9,0908%, carbohydrate content of 80.2744% - 85.7119%. The level of enrichment of proteins by the addition of mung bean flour to sweet potato flakes most preferred and acceptable panelists as consumer to the addition of 10% mung bean flour.**

***Keywords*— sweet potato, flakes, mung bean flour, protein, consumers preferences**

I. INTRODUCTION

Currently, government programs to diversification local food sources needed support technology to produce highly nutritious, inexpensive and applicable. Diversification food not only serves to provide alternative processing of local resources as an alternative food but also add value to the commodity.

One form of alternative food and diversification sources of carbohydrates are the manufacture of cereal flakes. Flakes is one of food products in the form of thin sheets, round, brownish yellow, and is usually consumed with milk or use can also be consumed directly as a snack for breakfast in the morning [5]. Making materials generally are flakes of rice, wheat and corn, but can also be made on the development of source tubers such as sweet potato.

Sweet potato (Ipomoea batatas L) is a good source of food because it contains enough carbohydrates, beta-carotene (provitamin A) and fiber [6]. Utilization of sweet potato in the manufacture of sweet potato flakes into flakes (SPF) has been performed in several studies. Several studies in the manufacture of sweet potato flakes that have been made in the study of which determines the formulation Flakes made from sweet potato flour, soybean sprouts, wheat germ as a functional breakfast products for children, Research Tamtarini [5] addition of koro komak 20% yield of sweet potato flakes are most preferred by the panelists.

In a previous study for the manufacture of sweet potato flakes use of raw materials in the form of sweet potato flour . Flakes made from sweet potato flour to go through lengthy processing of raw materials to be fresh sweet potato to make sweet potato flour. To provide an alternative treatment process of making flakes and efficiency in the processing, manufacture of sweet potato flakes in this study based sweet potato pasta. Pasta made from sweet potato is more effective when the process whereby after the steaming process and

then milling process using multi maker formed while the sweet potato pasta until flour is shaped through several processing stages and need more time.

According Khomsan [3], the activities are often overlooked breakfast nutritional content, and often missed because of the time, especially by children. Though breakfast is very important role in supplying blood sugar and other nutrients to the body in the morning so it can increase one's productivity, especially children, so as to support achievement in school. Therefore, the product must breakfast that contains complete and balanced nutrition.

Sweet potatoes, as well as other bulbs, has a relatively low protein content, so as to manufacture flake should be added other materials to increase the protein content. To meet the nutritional needs of sweet potato flakes contained in the primarily source of protein can be enhanced by protein enrichment through the addition of mung bean flour. Green beans (Phaseolus radiates) is a plant food that contains 20-25% protein.

Enrichment in food refer to the addition of vitamins, minerals and/or protein to raise it nutrient composition. This is usually done in food industry to replace losses that occur during manufacture, storage and handling food (restoration); to ensure nutritional equivalence in imitation or substitute foods; to compensate for naturally occuring variations in nutrient levels (standardization); toprovidelevels higher than those normally found in a food fortification; and to provide balance intake to micronutrients [1].

The purpose of the research is a source of enrichment of protein contained in sweet potato flakes (SPF) with the addition of mung bean flour. Mung bean flour enrichment level in 5 (5%, 10%, 15%, 20% and 25%). And to get an optimal result of consumer preferences with the addition of mung bean flour optimal still be accepted by consumers based on organoleptic test. With the expected green bean flour enrichment of sweet potato flakes have a better source of nutrition, especially protein and can increase the level of consumption as a breakfast cereal in the morning. And expected product would be as sweet potato flakes food products more competitive and have the appropriate quality assurance standards for consumers.

II. Materials And Methods

A. Materials

The material used is sweet potato and green bean flour bought from Pasar Minggu Jakarta. Additional materials using tapioca flour, sugar and salt. The tools used consists of a multi maker, oven, Broefild texture analyzer, and a roller.

B. Methods

The study was conducted at the Laboratory BPTP Jakarta in 2012. Study consists of the processing stages of the basic ingredients of sweet potato pasta, formulation, processing sweet potato flakes and organoleptic test proximat product. Experimental design using a completely randomized design 5 treatment composition of sweet potato paste and flour jalejo with 3 replications.

The main raw material in the processing of raw materials Sweet potato flakes is sweet potato pasta and tapioca starch. The first stage in the processing of sweet potato flakes is that gelatinization through the pasta-making process of steaming for 30 minutes. Making pasta begins with stripping the sweet potatoes, then soaked in water to prevent browning process (browning). Subsequently destroyed with multi maker and pasta ready to be processed into Sweet potato flakes.

After the making of pasta and then the process of making the sweet potato flakes (SPF) with the addition of a protein source by using mung bean flour. Sweet potato flakes is the process of making sweet potato pasta with each composition according to treatment with the addition of mung bean flour. Then add additional ingredients tapioca flour, refined sugar and salt. After mixing all the ingredients flaking process is done with a roller. In the arrangement did rhombus shaped flakes into a roasting tray then performed. The concentration of mung bean flour used was 5%, 10%, 15%, 20% and 25%. Making the sweet potato flakes (SPF) with the addition of mung bean flour has obtained a formula as in Table 1.

TABLE I
FORMULA SWEET POTATO FLAKES(SPF) WITH ENRICHMENT MUNG BEAN FLOUR

Raw materials	Treatments				
	I	II	III	IV	V
Sweet potato pasta	90%	85%	80%	75%	70%
Mung bean flour	5%	10%	15%	20%	25%
Tapioca starch	5%	5%	5%	5%	5%
Refined sugar					
Salt	5%	5%	5%	5%	5%
	0,5%	0,5%	5%	0,5%	0,5%

Parameter observations consists of moisture content, ash content, protein content, lipid content and carbohydrate content. Meanwhile organoleptic test on SPF(sweet potato flakes) include color, taste, odor, cracks and cracks in milk.

Organoleptic tests carried out by semi – trained panelists with six scale hedonic, they were 6 (really like), 5 (like), 4 (somewhat like), 3 (normal), 2 (do no like), 1 (strongly dislike).

III. Results And Discussion

SPF (sweet potato flakes) was made through some steps which every step affected yield of sweet potato flake production. As can be seen in Table .2, yield of sweet potato flakes decreased after some process. Washing and peeling caused almost 10% losing, while steaming caused about 20% losing. So that the yield of sweet potato flakes production 63%.

TABLE II
YIELD OF THE PROCESS OF SWEET POTATO FLAKES PRODUCTION

Process stage	Result product	average (%)
Washing and peeling	Sweet potatoes before steaming	90,80
Steaming	Sweet potatoes after steaming	85,45
Roasting	Sweet Potatos Flakes	63,00

Meanwhile, the chemical properties of sweet potato flakes (SPF) from proximate analysis (Table.3) showed that average moisture contents of different sweet potato flakes products every addition of mung bean flour. Sweet potato flakes water content increased after the addition of green bean flour into a 5.6713% - 6.2435%. Increased water content is due to the addition of mung bean flour and process-scale household production. Unlike the standard breakfast cereals that are processed by extrusion with advanced extruder with stable heat. In contrast to the fluctuating temperature oven with the heat that sometimes is not optimal and uneven.

TABLE III
ANALYSIS PROXIMAT SWEET POTATO FLAKES (SPF) WITH THE ADDITION OF MUNG BEAN FLOUR

Parameter	Mung bean flour added (%)				
	5	10	15	20	25
Moisture content	5,67	5,77	5,95	6,21	6,24
Ash content	2,75	2,85	2,82	2,98	3,09
Protein content	4,48	5,94	6,99	7,96	9,09
Lipid content	1,39	1,43	1,51	1,48	1,31
Carbohidrat content	85,71	84,02	82,75	81,38	80,27

The results of the analysis indicate that the ash content ash content SPF already meet the standards both before and after the mung bean flour added. The addition of mung bean flour to the highest concentration (25%) still meet the quality standards of milk ash content of cereal, a maximum of 4%. Result proximate analysis to ash content was 2.6768% (Table. 4) and ash content after the addition of mung bean flour ranged 2.7501% - 3.0858%.

TABLE IV
ANALISA PROXIMAT SWEET POTATO FLAKES (SPF) CONTROL

Parameter	Value
Moisture content (%)	4,120
Ash content (%)	2,6768
Protein content (%)	2,9764
Lipid content (%)	0,7169
Carbohidrat content (%)	88,718

Sweet potato flakes is a protein content of 2.9763% or 0.7440 grams per 25 grams of SPF per presentation. When compared with the standard cereal milk protein content SPF not meet the standards. For that, the addition of protein from mung bean flour. Based on the analysis of the obtained proximat protein levels after addition of mung bean flour is equal to 4.4765% to 9.0908%. When compared to standard cereal milk (minimum 5%), the SPF has met quality standards.

Sweet potato flakes is the fat content of 0.7169% and a fat content SPF after addition of mung bean flour showed a slight increase in value, amounting to 1.3902% - 1.5114%. When compared with the standard of product quality SPF has a lower fat content. This means not meet the standard criteria for the fat content even after the addition of mung bean flour.

Sweet potato flakes is the carbohydrate content of 88.7180% and carbohydrate levels after addition of mung bean flour is equal to 80.2744% - 85.7119%. Based on SNI 01-4270-1996, carbohydrate content of cereal products should be more than 60%. This suggests that the addition of sweet potato flakes with mung bean flour has a higher carbohydrate content than standard and are in the range of eligible.

TABEL V
THE HEDONIC TEST THE ADDITION OF SWEET POTATO FLAKES (SPF) WITH MUNG BEAN FLOUR (MBF)

MBF concen Tration (%)	color	Taste	Odor	crispness (texture)	Crispness in milk
5	$5,2^{a}$	$5,4^{a}$	$5,4^{a}$	$4,8^{d}$	$4,9^{a}$
10	$5,2^{a}$	$4,7^{ab}$	$4,9^{a}$	$4,9^{d}$	$5,1^{a}$
15	$3,4^{b}$	$4,2^{bc}$	$4,0^{bd}$	$3,2^{a}$	$3,7^{b}$
20	$1,3^{c}$	$2,1^{c}$	$2,5^{c}$	$1,5^{b}$	$1,5^{c}$
25	$4,0^{d}$	$3,6^{d}$	$3,4^{d}$	$4,3^{cd}$	$2,8^{d}$

Remarks: Figures followed by different letters in a column differ significantly at the 95% level based on Duncan's test

Based on Table 5. Indicates that the acceptance of the panelists on the hedonic quality parameters showed different values to the addition of mung bean flour on the Sweet potato flakes. Based on the parameters of the hedonic test showed that the addition of the color mung bean flour by 10% gives the highest value, that is 5.2 and was statistically significantly different to the other formulas.

The results of this assessment indicate that the panelists to the addition of 10% mung bean flour cause discoloration of Sweet potato flakes becomes brighter. Where the characteristics of mung bean flour is bright yellow and has a distinctive odor when added to the dough so that the Sweet potato flakes will change the color and odor of the base ingredients. However, the higher concentration of mung bean flour is added it increasingly lower levels of panelist on the color of the product.

Similarly the parameters of taste, odor and overall appearance (overall) the highest value obtained on the addition of 10% mung bean flour. The addition of the mung bean flour to sweet potato flakes caused changes to the odor. The higher concentration of mung bean flour are used then the odor of sweet potatoes flakes on decreased and the odor of mung bean flour increasingly dominant.

Acceptance of the parameters scent panelists give the highest value on the addition of mung bean starch 5%, that is 5.4 and statistically significantly different from the other treatments. The higher concentration of mung bean flour are used increasingly lower levels of panelist on the odor sweet potato flakes. Similarly, the parameters of taste panelists showed that the level of preference that the Sweet potato flakes with add mung bean flour as much as 10%. The higher the addition of mung bean flour then the lower the preference level of the sweet potato flakes panelists.

Thus the addition of mung bean flour affect taste of the sweet potato flakes. Seen that the panelists did not like the addition of mung bean flour which is higher than 10%. This needs to be a concern in formulating the sweet potato flakes with a source of protein for not reduce the level of consumer preferences towards product sweet potato flakes due to the effect caused by the protein source.

This is likely due to different production processes and content of compounds in different sweet potato with a standard breakfast cereals. However, in this study performed on the source of protein fortification on the sweet potato flakes with the addition of mung bean flour to meet the standards of cereal products. Data analysis results proximat sweet potato flakes based pasta with the addition of mung bean flour are presented in Table 5.

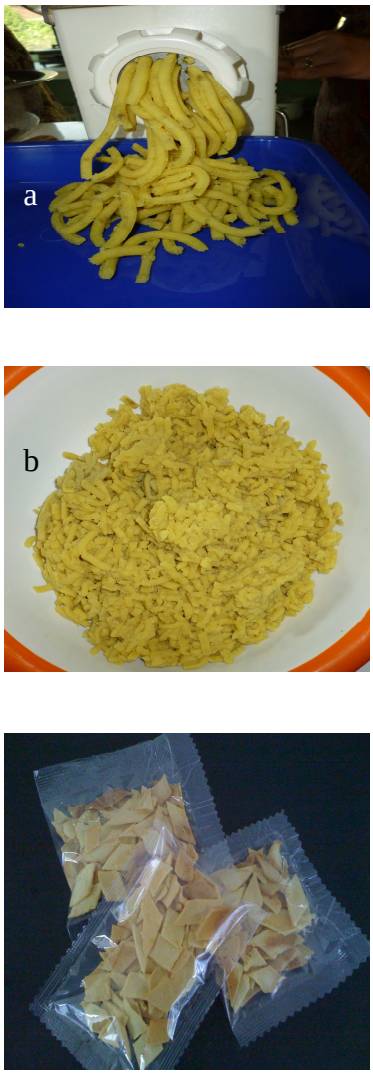

Fig. (a). Sweet potatos pasta ; (b). SPF (Sweet Potatos Flakes)

IV. Conclusions

Flakes made from sweet potatoes with the addition of mung bean flour fortification has the potential to be developed into an alternative food that contains complete and balanced nutrition for the community. With mung bean flour fortification in SPF (Sweet Potato Flakes) get an increase in protein content and carbohydrates in accordance with the requirements as a breakfast cereal. The level of enrichment of proteins by the addition of mung bean flour to sweet potato flakes most preferred and acceptable panelists to the addition of 10% mung bean flour on color, taste , odor and crispness of the sweet potato flakes. Sweet potato flakes (SPF) can replace breakfast cereals made from rice and wheat that has been widely consumed by the public.

References

[1] Codex Alimentarius Commission, 1987

[2] Horton, D., G. Prain, and P. Gregory.1989. High level invesment retuns for global sweet potato research and development Circular 17(3):1-11

[3] Khomsan, A, 2002. Pangan dan Gizi kesehatan. PT. Raja Grafindo Persada. Jakarta.

[4] Koeswara, S. 2003. Optimasi Teknologi Pengolahan Sweet Potatos Flakes. Laporan Akhir penelitian Rusnas Diversifikasi Pangan Pokok. Pusat Studi Pangan dan Gizi-IPB. Bogor.

[5] Tamtarini dan Sih Yuwanti. 2005. *Pengaruh Penambahan Koro-Koroan terhadap Sifat Fisik dan Sensorik Flake Ubi Jalar* dalam Jurnal Teknologi Pertanian Vol. 6, No.2, Agustus 2005 ISSN 1411-5131 Hal. 143-211.

[6] Nur Richana dan Widaningrum. 2009. Pengunaan Tepung dan Pasta dari Beberapa Varietas Ubi Jalar Sebagai Bahan Baku Mie. Jurnal