PROCEEDINGS-BASIC-2016_1.pdf

by

Submission date: 13-Apr-2023 02:41PM (UTC+0700)
Submission ID: 2063303511
File name: PROCEEDINGS-BASIC-2016_1.pdf (458.38K)
Word count: 1523
Character count: 7713

Proceeding of the 6th Annual Basic Science International Conference
Published online, on June 7, 2016.

Basic Nutrient Content Characterization of Uwi Banggai (*Dioscorea alata*)

Ayu Puspitasari*, Wisnu Istanto, Nurcholis

Department of Health Analysis, Polytehnique of Health, Ministry of Health, Karangmenjangan 18A Surabaya, Indonesia
*Corresponding author: [ayu_depkes@yahoo.com]

Abstract – On this research, scientific information about basic proximate contents of Uwi Banggai's tuber and flour were summarized. The parameters examined were water, starch, protein, fat and total carbohydrate contents. Flour was produced from tuber of Uwi Banggai by cutting, drying under the sun, and grinding it. Water content analysis used air oven method, starch content analysis used Luff Schoorl method, protein content analysis used Kjedahl method, fat content analysis used Soxhlet method, and total carbohydrate analysis used DNS method. The variety of Uwi Banggai examined was white (Butun) and purple (Banggai). The result of this research showed that white Uwi Banggai's tuber had 69.18% of water, 21.14% of starch, 2.7% of protein, 0.57% of fat, and 21.53% of total carbohydrate, while the purple one had 68.48% of water, 27.91% of starch, 1.25% of protein, 0.30% of fat, and 28.43% of total carbohydrate. Then, white Uwi Banggai's flour contained 8.53% of water, 61.41% of starch, 4.45% of protein, 0.61% of fat, and 62.58% of total carbohydrate, whereas the purple one had 8.31% of water, 68.94% of starch, 5.15% of protein, 0.41% of fat, and 70.21% of total carbohydrate.

1. INTRODUCTION

According to BPS (Badan Pusat Statistika) projection, Indonesia's population in 2015 reaches approximately 216 billion with growth rate 1.4%/year. To fulfill food requirement of human and meet the food sustainability program of Indonesian government, available food for consumption should be sufficient in quantities and nutritional value. The world condition nowadays shows the increasing of biggest food demand come from developing countries (around 85%), while the increasing of the production of food in the world are from developed countries (around 60%) [1]. One of potential tuber to be developed as carbohydrate source and also possess good compound for health is Uwi (*Dioscorea alata L.*). Nevertheless, the cultivation of Uwi in Indonesia have not yet maximized due to the lack of information of Uwi's nutritional value. Uwi Banggai (*Dioscorea alata*) as one of many types of Uwi, has been cultivated, consumed and became one of main food for people in Banggai Kepulauan, Sulawesi Tengah. It was discovered that uwi Banggai had high variety diversity [2]. Uwi Banggai is consumed in the terms of tuber and flour, but its nutrient content has not been explored extensively. The aim of this research was to gain basic nutrient content information of two varieties of Uwi Banggai.

2. METHODS

2.1 Chemicals

The reagent used in this research were sodium thiosulfate, amylum, potassium iodate, copper sulfate, sodium carbonate, citric acid, sulfuric acid, chloride acid, DNS reagent, ether, boric acid, sodium hydroxide, and selenium mix.

2.2 Procedures

The objects of this research consist of two types of uwi Banggai, namely white uwi Banggai and purple uwi Banggai, in the terms of its tuber and flour. Flour was made by traditional method. The tubers were cut; total cleaned, got thin slices, and dried under the sun light for 2 – 3 days. The dry thin tubers then were grilled to produce fine flour. The moisture content analysis was conducted based on AOAC (2000), which was air oven method. The temperature used was 105 °C; the objects were dried until its weight reached constant number. The weight difference before and after drying was considered as the water content lost. Starch content was performed by Luff Schrool method. The samples were hydrolysed to breakdown polysaccharide chain. The solution obtained was then titrated using Iodometry method to gain the value of starch content. The protein

content analysis of the objects was conducted following Kjehdahl methods. The objects were having distraction to release nitrogen. The nitrogen then was distillated and titrated. The fat content was examined with Soxhlet method. Fat was extracted from the objects using Soxhlet apparatus, and the fat solution was dried in the air oven until its weight was constant. The total carbohydrate was explored using DNS method [3]. This method requires specific equipment, spectrophotometer UV-VIS. The objects and glucose standard with several concentrations were added with DNS reagent and boiled. The absorbent of the results were measured utilizing spectrophotometer UV-VIS. Standard curve was then calculated, and the absorbent of the objects was plotted toward the standard curve to obtain total carbohydrate content.

3. RESULTS AND DISCUSSION

The basic nutrient content of white and purple uwi Banggai are presented in table 1. White uwi Banggai tuber has moisture content bigger than the purple one, as the white uwi Banggai flour also had bigger moisture content than the purple variety. The drying process for 2 – 3 days in the making of uwi Banggai flour had given moisture content suitable with moisture content standard for flour which was less than 14%. The amount of free water contained in the food would be used by microorganism to activity and was declared with water activity (Aw) [4]. Thereby, moisture content in food was limited.

Table 1 Basic Nutrient Content of White and Purple Uwi Banggai

NO	Variety	CONTENT (%)				
		WATER	STARCH	PROTEIN	FAT	TOTAL CARBOHYDRATE
1.	White tuber	69.18	21.14	2.7	0.57	21.53
2.	Purple tuber	68.48	27.91	1.25	0.30	28.43
3.	White flour	8.53	61.41	4.45	0.61	62.58
4.	Purple flour	8.31	68.94	5.15	0.41	70.21

The starch and carbohydrate total contents of white and purple uwi Banggai tuber and flour, as seen in Table 1 were quite different. The white variety of uwi Banggai has less starch content than the white one, as it also applies for the flour. To be compared with others variety of uwi, starch content of uwi Banggai has equal potential, considered uwi is one of carbohydrate source. Starch content of ubi kayu is 21.73 % [5], while starch content of orange ubi Jalar, white ubi Jalar, and purple ubi are 15.18%, 28.79%, 12.64% [6]. Uwi Banggai flour which made by traditional method also has the potential to compete with other variety of uwi flour, such as uwi flour from Ghana with 60.3% –74.4% [7], and uwi flour of Ganyong, Suweg, Ubi Kelapa, Gembili with 55,32%, 45,75%, 63,31%, dan 51,34%, of starch content [8]. Quality standard of flour requires minimum starch content of 55%. Economically, flour from uwi has been consumed widely in Asia, Africa, and Oceania. Thereby, uwi Banggai should be subsumed as alternative carbohydrate source of food along with rice.

To overview protein content of uwi Banggai, its result is quite bigger to be compared with protein content from other variety of uwi usually consumed in Indonesia. Flour of white, yellow, purple of ubi Jalar each has protein content as much as 2,11%, 4,42%, dan 2,79% [9]. The quite large protein contained in flour of uwi Banggai has become value added in fulfilling the need of sufficient nutrient for those who consume it. Moreover, with its quite high protein content, it is not necessary needed substituent for protein.

Fat content of uwi has been expected to be low. Fat could interfere to gelatination process due to its ability to attach with amylose [8]. From the research, it is known that the fat content of uwi Banggai in terms of tuber and flour are quite low, compared with others variety of uwi. The flour of Ganyong, Suweg, Ubi Kelapa, and Gembili each has fat content of 1,22%, 1,64%, 0,09%, dan 0,89% [9]. From its low fat content, it can be seen that flour of uwi Banggai has meet the good standard to be consumed, for health.

4. CONCLUSION

It was concluded that the tuber and flour of uwi Banggai had the equal potential basic nutrient content with others type of uwi (yam), which has main function as carbohydrate source. Uwi Banggai is advised to be consumed widely in the daily meet of body macro nutrition need.

5. REFERENCES

1. Krisnamurti, B. 2003. *Rencana Strategis dan Program Kerja Pemantapan Ketahanan Pangan 2001-2004*.
2. Yalindua, A. 2014. *Potensi Genetik Klon Tanaman Uwi (Dioscorea alata L.) asal Banggai Kepulauan Sebagai Sumber Pangan Dalam Menunjang Ketahanan Pangan*. Disertasi. IPB.
3. Miller, G.L. 1959. *Analytical Chemistry*. 31: 426-428
4. Estiasih, T., and Ahmadi, K. 2009. *Teknologi Pengolahan Pangan*. PT. Bumi Aksara.
5. Nurdjanah, S., Susilawati, Sabatini, M.R. 2007. *Jurnal Teknologi dan Industri Hasil Pertanian*. Vol. 12 No 2.
6. Dewi, E. 2007. *Studi Analisis β-Karoten, Kadar Fenol dan Aktifitas Antioksidan Beberapa Klon Ubi Jalar Kuning dan Oranye*. Skripsi. Universitas Brawijaya.
7. Baah, F.D., Maziya-Dixon, B., Asiedu, R., Oduro, I. and Ellis, W.O. 2009. *Journal of Food, Agricultural & Environment*. 7 (2): 373-378
8. Richana, N., and Sunarti, T.C. 2004. *Jurnal Pascapanen*. 1(1): 29-37
9. Ambarsari, I., Sarjana, and Choliq, A. (2009). *Rekomendasi dalam Penetapan Standar Mutu Tepung Ubi Jalar*. BPTP.

PROCEEDINGS-BASIC-2016_1.pdf

ORIGINALITY REPORT

1%	1%	1%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	iopscience.iop.org Internet Source	1%

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		