ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 11, Issue, 03, pp.2512-2514, March, 2019
DOI: https://doi.org/10.24941/ijcr.34806.03.2019

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

DEVELOPMENT AND QUALITY EVALUATION OF READY-TO-USE COCONUT FLOUR

***Ramya, H. and Neeta Pattan**

Smt. VHD Central Institute of Home Science, Bangalore, Karnataka, India

ARTICLE INFO

Article History:
Received 26th December, 2018
Received in revised form
20th January, 2019
Accepted 08th February, 2019
Published online 31st March, 2019

Key Words:

Coconut flour, Functional food, Nutritional composition.

Corresponding author:* **Ramya, H.

ABSTRACT

Coconut flour is a by – product prepared from coconut residue obtained after the extraction of coconut milk. Utilization of food by – products and wastes receive more attention in the food industry. Coconut flour is believed as a "functional food" because it provides many health benefits beyond its nutritional content. Hence a study has been undertaken to develop standardized procedure for the extraction of coconut flour from fresh coconuts and to analyze the nutritional composition of coconut flour. Nutritional composition of standardized coconut flour was determined by conducting proximate chemical analysis using standard methods (IS 7874, IS 1656 and Physio chemical method). The physical characteristics of coconut flour were observed for colour, odour, taste, particle size and high water absorption capacity. The physical characteristics of coconut flour were found as off-white colour, nutty odour, bland taste, fine to medium particle size with high water absorption capacity. Proximate composition of coconut flour revealed that 32.13 per cent of carbohydrates, 3.88 per cent of protein, 25.41 per cent of fibre, 33.56 per cent of fat content and 411.3 kcal content per 100 grams.

Citation: Ramya, H. and Neeta Pattan, **2019.** "Development and quality evaluation of ready-to-use coconut flour", *International Journal of Current Research*, 11, (03), 2512-2514.

INTRODUCTION

In the past two decades, there has been a tremendous demand for functional foods among the consumer due to their potential for providing health benefits. Coconut is the most important versatile crop, which provides all required amenities for human life. The coconut provides a nutritious source of meat, juice, milk, and oil that has fed and nourished populations around the world for generations. Coconut is rich in fiber, vitamins, and minerals. It is believed as a "functional food" because it provides many health benefits beyond its nutritional content. Coconut is naturally low in digestible carbohydrate, contains no gluten, is cheaper than most other nuts, and is loaded with health promoting fiber and important nutrients. Coconut flour is a by – product prepared from coconut residue obtained after the extraction of coconut milk. Coconut flour is extremely high in fiber with almost double the amount found in wheat bran. Coconut flour can improve digestion, help regulate blood sugar, protect against diabetes, help prevent heart disease and cancer, and aid in weight loss. Hence a study has been undertaken to develop standardized procedure for the extraction of coconut flour from fresh coconuts and to analyze the nutritional composition of coconut flour.

MATERIALS AND METHODS

The research design of standardization of coconut flour extraction and analysis of its nutrient composition was depicted in plate 1. The experiment was carried out at the Department of Food and Nutrition, Smt. VHD Central Institute of Home Science and Research Centre, Bangalore. Fresh coconuts were procured from a local market in Bangalore. Coconut flour was extracted by using fresh coconuts and subjecting it to processes like manual paring, soaking, grinding, dry roasting etc. to obtain smooth and ready to use coconut flour. Nutritional composition of standardized coconut flour was determined by conducting proximate chemical analysis (Moisture content, Carbohydrate, Ash, Fibre, Fat, Protein, and Energy) using different methods (IS 7874, IS 1656 and Physio chemical method). This was conducted at Ramaiah Advanced Testing Laboratory, Bangalore.

RESULTS AND DISCUSSION

Fig.1. Depicts the flow chart of the standardized procedure for the extraction of coconut flour. The fresh coconuts were subjected to deshelling and manual paring (removal of the brown layer of coconut). Approximately sliced to 10mm of thickness and soaked in boiled water. After 10 minutes, the sliced pieces were ground with hot water in a mixer grinder. Once ground, milk is extracted from the residue with the help of a strainer. The remaining portion after milk extraction is the coconut residue which is then dry roasted on a low flame for 30 minutes to remove the moisture. The product obtained thereafter is the coconut flour. Researches on procedures of extraction of coconut flour by different authors revealed results. According to Hossain *et al*., (2016), coconut flour was processed after de-husking and splitting the coconut, water was drained. Then the kernel (meat) was collected and removed milk by crushing with hand crusher and dried by mechanical

dryer for 6 hours at 60oC. The dried coconut was grinded to produce flour. The coconut flour was packed in a high density polyethylene, sealed and stored.

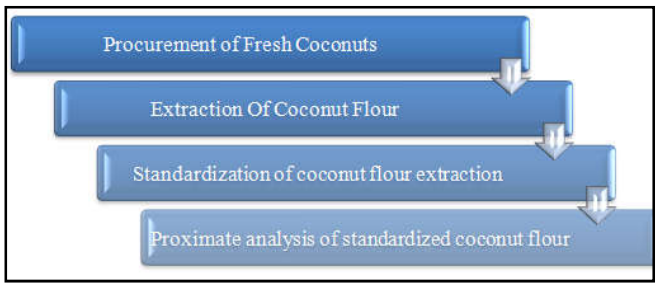

Plate 1. Research Design

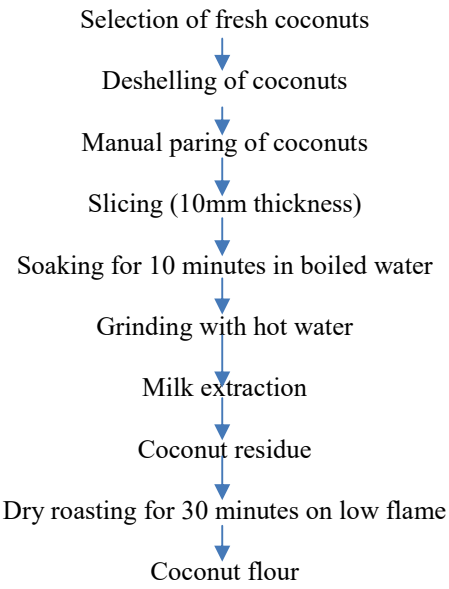

Fig. 1. Flow chart of the standardized procedure for the extraction of coconut flour

Table 1. Depicts the physical characteristics of coconut flour after its extraction. Parameters colour, odour, taste, particle size, water absorption capacity and Swelling capacity were observed. The results showed indicated that the coconut flour had off-white colour, nutty odour, bland taste, fine to medium particle size and it has 476.3±2.76 per cent water absorption capacity. The swelling capacity of coconut flour was found to be 828.8±1.96 per cent. Water absorption capacity may vary with coconut flour with different range of particle size. With increase in size of coconut flour, water absorption capacity (WAC) and swelling capacity (SC) values increased; whereas, OBC value decreased. Maximum value of water retention capacity (WRC) was observed at 0.20–0.25 mm of particle size (Lai Quoc and Vo Thi, 2017). Data from Table 2 unfolds the nutritional composition of the standardized coconut flour. Carbohydrate content was found to be 32.13g whereas the protein and fat content was 3.88g and 33.56g respectively per 100 grams of the coconut flour. The coconut flour was found to be with 25.41 grams of fibre in 100 grams. Calories contribution was found to be 411.3 kcal from 100 grams of coconut flour.

According to Philippine Coconut Authority (2006), coconut flour contained 12.6 % proteins, 13.0 % fibers, 9.2 % fat, 13.7 % sugars, 8.2 % ash and 4.2 % moisture.Anon., 2014 chemical composition of coconut flour revealed that the moisture as 50.0 percent, Ash content as 4.0-6.0 percent, Protein 10.0-19.0 percent, Fat 10.0-12.0 percent and Total Dietary Fiber 40.0-60.0 percentper 100 grams. Inanother study, Lai Quoc and Vo Thi (2017) reported that coconut flour contains 6.1 % moisture, 1.15 % ash, 5.8 % protein, 29.8 % fat, 37.3% carbohydrate and 19.8 % crude fiber. According to Trinidad *et al*. (2006), coconut flour contains about 60 g dietary fiber/100 g, of which 56 percent is insoluble dietary fiber while 4 percent is soluble dietary fiber. This was found to be almost double that of wheat bran and 4 times that of oat bran (Ramaswamy, 2014). Trinidad et al. (2006) reported that the dietary fibre content of coconut flour was 60.0 +/- 1.0g/100g sample, 56% insoluble and 4% soluble. Dhankhar 2013 revealed that Coconut powder contained 3.43±0.81% moisture content, 5.1 % ash, 13.4% fat, 7.13±0.32% protein and 13.54±0.64% fiber. Yelgam and Chavan revealed that Coconut powder contained 3.7% moisture content, 2.03±0.02% ash, 64.10±0.75% fat, 21.8% protein and 9.3% fiber. The variations in the nutrient composition may be attributed to method of coconut flour extraction.

Table 1. Physical Characteristics of Coconut flour

Parameters	Characteristic of Coconut Flour
Color	off-white
Odor	slightly nutty odor
Taste	bland taste
Particle Size	fine to medium
Water absorption capacity (%)	476.3±2.76
Swelling capacity(%)	828.8±1.96

Table 2. Proximate Analysis of Standardized Coconut Flour

Parameters	Results
Energy, kcal/100g	411.30
Carbohydrates %	32.13
Protein %	3.88
Fat %	33.56
Fibre %	25.41

Conclusion

The coconut flour contained more calorie free fiber than other wheat alternatives. Coconut flour also provides a good source of protein. Trinidad *et al.* 2001 reported that coconut flour can provide not only value added income to the industry, but also a nutritious and healthy source of dietary fibre. It is not just a convenient food which is easy to use but is also high in fibre and protein, and contains no added sugar which provides health benefits. This can also provide commercial opportunities for coconut farmers as well as small scale food processing industries.

REFERENCES

Anon, 2014. Coconut Processing Technologies, Philippine Coconut Authority, FPDD guide no. 4

Daniela, S. 2016. Researches regarding the influence of coconut flour addition on the nutritional value of gluten-free cookies. *Journal of Agro-alimentary processes and technologies,* 2, 22(4): 292-300

Dhankhar, P. 2013. A Study on Development of Coconut Based Gluten Free Cookies. *International Journal of Engineering Science Invention,* 2 (12) :10-19.

Hossain, S., Shishir, M R I., Md. Saifullah., Kayshar, M., Tonmoy, S W., Rahman, A. and Md. Shams-Ud-Din, 2016. Incorporation of Coconut Flour in Plain Cake and Investigation of the Effect of Sugar and Baking Powder on

Its Baking Quality. *International Journal of Nutrition and Food Sciences,* 5(1) : 31-38.

Lai Quoc, D. and VO Thi, H. P. 2017. Functional properties and influence of coconut flour on texture of dough and cookies. *Vietnam Journal of Science and Technology*, 55 (5A): 100- 107.

PCA, 2006. Production of coconut flour and virgin coconut oil. Philippine Coconut Authority. Retrieved (http://www.pca.da.gov.ph/pdf/techno/flour_vco.pdf).

Trinidad, P. T., Faridah, C. A., Joan, C. C., Rosario, L. R. and Dina, B. M. 2004. The cholesterol lowering effect of coconut flakes in humans with moderately raised serum cholesterol. *Journal of Medical Foods,* 7(2):136–40.

Trinidad, P.T., Divinagracia, H.V., Aida, C.M., Faaridah, C.A., Angelica, S.M., Modesto, T.C., Askali, C.A., Loyola, A.S. and Masa, D.B. 2001. "Coconut flour from residue: A good source of dietary fibre", *Indian Coconut Journal,* 32 (6):.9–13.

Trinidad, P.T., Mallillin, A.C., Valdez, D.H., Loyola, A.S., Castillo, J.C., Encabo, R.R., Masa, D.B., Maglaya, A.S. and Chua, M.T. 2006. " Dietary fiber from coconut flour", A functional food. *Innovative Food Science and Emerging Technologies*, 7: 309-317.

Yalegama, L. L. W. C., Karunaratne, D. N., Sivakanesan, R. and Jayasekara C. 2013. Chemical and functional properties of fibre concentrates obtained from by-products of coconut kernel. *Journal of Food Chemistry*, 141: 124 – 130.

Yelgam and Chavan, 2006. Studies on coconut flour as a source of cell wall polysaccharide. *Tropical Agriculture Research,* Vol 18: 126-134.

****