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Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorpjn@gmail.com

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Proximate and Mineral Composition of Roasted and Defatted Cashew Nut (*Anarcadium occidentale*) Flour

Omosuli Segun Vincent[1], Ibrahim Tesleem Adewale[1]*, Oloye Dare[1],
Agbaje Rachael[1] and Jude-Ojei Bolanle[2]
[1]Department of Food Science and Technology, [2]Department of Nutrition and Dietetics,
Rufus Giwa Polytechnic, P.M.B 1019, Owo, Ondo State, Nigeria

Abstract: Cashew nut (*Anarcadium occidentale*) was roasted, defatted and processed into flour. The flour was evaluated for its physicochemical characteristics (Proximate and Minerals). The proximate composition (%) was as follows: moisture (5.52±0.2) ash (4.41±0.1), crude fat (34.95±0.2), crude protein (27.31±0.0) crude fibre (1.42±0.2) carbohydrate (by difference) 25.39 and energy (Kcal) (534.35). The result of the mineral composition (mg/100 g) showed that roasted and defatted cashew nut flour contains calcium (21.4±0.23) potassium (38.5±0.1) magnesium (36.4±0.3) Iron (0.8±0.1) Zinc (0.9±0.1), Sodium (22.6±0.2) Copper (0.4±0.1). It is obvious that the flour is a good source of energy, protein and minerals.

Key words: Roasted, defatted, physicochemical, protein, ash

INTRODUCTION

Many plant protein usually in the form of protein extracts or seed flours are being investigated and tested for new products such as low cost fabricated foods, which are nutritious attractive and acceptable to consumers just like conventional foods from meat, fish and dairy products. Cashew nut (*Anarcadium occidentale*) is a heart like shaped fruit widely grown in Africa and West Indies. The cashew tree is a native of Brazil and the lower Amazons. The cashew has been introduced and is a valuable cash crop in the Americans, West Indies, Madagascar, India and Malaysia (Frankel, 1991). The major producing countries of cashew are Tanzania, India, Mozambique Sri Lanka, Kenya, Madagascar, Thailand, Malaysia, Nigeria, Malawi and Angola World bank data estimates that 97% of production is from wild trees and only 3% is from established plantation (Rosengarten, 1984). In Nigeria about 5000-7000 tones are produced annually mainly as an export crop (Aremu *et al*., 2006).

Africa is the third largest global source of cashew nut and produces about 100,000 tones per year (Spore, 1997). According to Fetuga *et al*. (1974), only about 60-65% of the total cashew production in Africa is utilized while the rest are discarded. There are limited information in the nutritional, utilization and physicochemical properties of roasted and defatted cashew nut flours. This study was aimed, at investigating the proximate and mineral composition of roasted and defatted cashew nut flour as such results may expand the knowledge on the utilization and nutritional qualities of the cashew nut flour.

MATERIALS AND METHODS

Collection of cashew nuts: The cashew samples were collected from Ebira farms near Rufus Giwa Polytechnic, Owo, Ondo State. The nuts were thoroughly screened to remove the bad ones.

Preparation of cashew nuts flour: The Cashew nuts were cut into halves using the manual cashew kernel cutter. After cutting; the nuts were pulled out and roasted in oven at 100°C for 2 h. The covering testa were removed by squeezing and then winnowed to obtain cream colour nuts. The nuts were then broken into smaller pieces and defatted using hexane solvent. Defatted nuts were milled using Kenwood blender into flour. The cashew nut flour was allowed to pass through a sieve with mesh size 0.5 mm and packaged in polytene bag for further analysis.

Proximate composition determination: The recommended methods of Association of Official Analytical Chemist (AOAC, 1990) were employed in determining the moisture ,ash, crude fibre, crude fat and crude protein contents. Energy value was obtained using the method of Osborne and Voogt (1978) and carbohydrate content was determined by difference.

Mineral determination: The minerals: calcium, magnesium, iron, zinc, copper were determined by Atomic Absorption Spectrophotometry (Agte *et al*., 1995) while sodium and potassium were determined using flame photometry (Chapman and Pralt, 1961).

RESULTS AND DISCUSSION

The proximate compositions (%) of the roasted and defatted cashew nut flour studied are shown in Table 1. From the data; it was observed that the flour contained moisture of (5.52±0.2), Ash (4.41±0.1) crude fat (34.95±0.2) crude protein (27.31±0.0) crude fibre (1.42±0.2) carbohydrate by difference (25.39) and Energy

Table 1: Proximate composition of roasted and defatted cashew nut flour

Composition	(%)
Moisture	5.52±0.2
Ash	4.41±0.1
Crude fat	34.95±0.2
Crude protein	27.31±0.0
Crude fibre	1.42±0.2
Carbohydrate by difference	25.39000
Energy (Keal)	534.35000

Mean value of triplicate result ± standard deviation

Table 2: Mineral composition of roasted and defatted cashew nut flour

Mineral	Composition (mg/100g)
Calcium (Ca)	21.4±0.1
Potassium (k)	38.5±0.0
Magnesium (mg)	36.4±0.2
+ Iron (fe)	0.8±0.1
+ Zinc (zn)	0.9±0.4
Sodium (Na)	22.6±0.2
+ Copper (Cu)	0.4±0.1

Mean value of triplicate result ± standard deviation

(Kcal) (534.35). The moisture mean value of the flour was low when compared to moisture content of most legumes usually between 7.0 and 11.0% as reported by Arkroyed and Doughty (1964). However, this result is in close agreement with those reported by Aremu *et al.* (2006), Ige *et al.* (1984) and Fagbemi and Oshodi (1991) for fluted pumpkins seed of 5.0 and 5.50%, respectively. The Ash content of the studied flour was 4.41±0.1%, which was nearly same with the findings of Aremu *et al.* (2006). It has been recommended by Pomeranz and Clifton (1981) that ash contents of nuts, seed and tubers should fall in the range of 1.5-2.5% in order to be suitable for animal feeds. The ash content of the flour does not fall within this range hence, it cannot be recommended for animal feeds. The crude fat with a value of 34.95±0.2% is low when compared to the values of pumpkin seed (47.01%) as reported by Fagbemi and Oshodi (1991), within the range of Aremu *et al.* (2006) but is high compared to Soybean seed which has only 23.5% fat as reported Paul and Southgate (1980). Fat is important in foods because it promotes fat soluble vitamin absorption (Bogert *et al.*, 1994); it is a high energy nutrient and does not add to the bulk of the diet.

The crude protein of the 27.31±0.0 is highly comparable to protein rich foods such as Soybeans, Cowpeas, Pigeon peas, Melon, Pumpkin and gourd seeds ranging between 23.1-33.0% (Olaofe *et al.*, 1994) and jack bean 30.8% (Anonymous, 1972). It can be evaluated from this study that the roasted and defatted cashew nut flour can supply the recommended daily intake of protein for children (23.0-36.0g) (NRC, 1989). The crude fibre content of the Cashew nut flour (1.42+0.3) was very low compared to legumes with mean values ranging between 5-6% (Aremu *et al.*, 2006). Crude fibre helps in the maintenance of normal peristaltic movement of the intestinal tract hence, diets containing low fibre could cause constipation and eventually lead to colon diseases (Okon, 1983). The value obtained for carbohydrate (by difference) 25.39% is in the same proportion to the result of Aremu *et al.* (2006) of 26.8% which are an acceptable range mean values of legumes, 20-60% of dry weight (Arkroyed and Doughty, 1964). This result thus, gave an indication that the cashew nut flour is a rich source of energy and capable of supplying the daily energy requirements of the body. This could be due to the high levels of crude fat and crude protein in the studied sample. The calculated metabolizable energy value (534.35 kcal) showed that cashew nut flour is a concentrated source of energy.

Table 2 presents the mineral content (mg/100 g) of the cashew nut flour. The most abundant of the minerals was potassium (38.5±0.0) followed by magnesium and calcium with values of 36.4±0.2 and 21.4±0.1, respectively. The least abundant were copper, iron and zinc. These results were in close agreement with the observation of Olaofe and Sanni (1988) and Aremu *et al.* (2006). Magnesium has been reported to be involved in maintaining the electrical potential in leaves and activation of some enzyme systems. (Ferro *et al.*, 1987). The calcium content is in agreement with Aremu *et al.* (2006). Calcium is responsible for bone formation in conjuction with phosphorous, magnesium, manganese, vitamin A, C and D; chlorine and protein (Akinhanmi *et al.*, 2008). Phosphorous and calcium occur together in the body to maintain body blood. Low Ca/ p ratio facilitates calcinations of calcium in the bone (Nieman *et al.*, 1992) the ratio of sodium to potassium (Na/k) in the body is a great concern for prevention of high blood pressure. Na/k ratio <1 is recommended (Nieman *et al.*, 1992). The Na/k ratio in this study (0.59) is an indication that consumption of the roasted and defatted cashew nut flour would probably reduce high blood pressure disease.

Conclusion: The studied flour (roasted and defatted cashew nut flour) is rich in important food nutrients compared to some other foods. The presence of high protein content in the flour showed it's usefulness as a good source of amino acids for children and adults. Also, the presence of good level of elemental minerals showed its reliability in correcting nutritional disorders.

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