Direct RESEARCH JOURNALS

Effects of processed fluted pumpkin vegetables leaves (ugu) on certain meals in Kontagora, Nigeria

Direct Research Journal of Agriculture and Food Science (DRJAFS)
Vol.3 (6), pp. 138-142, June, 2015
Available online at directresearchpublisher.org/drjafs
ISSN 2354-4147 ©2015 Direct Research Journals Publisher

Research Paper

[1*]OGORI A. F., [2]JOEGULUBA O., [3]ALEX ONYOCHA O. U., [4]TANKO .S., [5]APEH M. E. and [6]ABIGAIL Y.

[1,2,4,6]Federal College of Education School of Vocational Education P.M.B 39 Niger State, Nigeria.
[3]Dorben Polytechnic, Department of Hospitality Management Bwari Abuja, Nigeria.
[5]Federal College of Education, Department of Chemistry F.C.E Zuba –Abuja, Nigeria.

*Corresponding Author E-mail: ogoriakamafriday@gmail.com

Accepted 30 May, 2015

Telfairia occidentalis is a tropical vine grown in West Africa as a leaf vegetable and for its edible seeds. Common names for the plant include fluted gourd, fluted pumpkin, and ugu. T. *occidentalis* is a member of the Curcurbitaceae family and is indigenous to southern Nigeria. The instrument used in carrying out this research, gathering of information from the respondents was questionnaire. The result revealed that 79% of the respondent generally accepted the taste, appearance and aroma of fresh *T. occidentalis* ugu vegetable in term of cooking, heating of its foods. Soup and sauce foods from fresh ugu vegetable were most acceptable while the remaining 21% of the respondent extremely liked dried ugu for it vegetable taste, appearance, and aroma .Based on the finding of this research, the researcher recommends *T. occidentalis* fresh ugu vegetable in cooking and in preparing soup and sauce, hence the families should not deprive themselves from eating fresh ugu vegetable because of it nutrient availability and Phyto-nutrient addition.

Key words: Processed ugu, dried, fresh, soup, sauce, jellof rice.

INTRODUCTION

Telfairia occidentalis Hook f. is a tropical vine grown in West Africa as a leaf vegetable and for its edible seeds. Common names for the plant include fluted gourd, fluted pumpkin, and *ugu.* Locally it is called 'ugu' by Ibos in Eastern part of Nigeria, Yoruba, 'egusi iroko' and Benin, 'uwmenkhen'. The plant is dioecious, perennial, and drought-tolerant. It is usually grown trellised. The young shoots and leaves of the female plant are the main ingredient of Nigerian *edikang ikong* soup (Badifu et al., 1995). It is a creeping vegetative shrub that spreads low across the ground with large lobed leaves, and long twisting tendrils (Horsfall and Spiff, 2005). It thrives in humid climate and well drained soils and is usually cultivated in garden and family farms around homes. *Telfairia occidentalis* belongs to the family Curcubitaceae and has a simple, dark green veined leaf that is as wide as 18 cm and long as 35 cm. The Curcubitaceae are reported to have been associated with man since 12,000 BC (Esquinas-Alcazar and Gulick, 1983). The leaves are rich in iron and play a key role in the cure of anemia. The leaves are also noted for lactating properties and are in high demand for nursing mothers. The leafy vegetable is

used mainly for soups, and salads to accompany main course (Hopkins, 2001; Agatemor, 2006).

Telfairia occidentalis is an important food vegetable for many people especially in the mid-western and eastern parts of Nigeria. The local names include “ugu” (Igbo) and “iroko” (Yoruba). The crop is a member of the cucurbitaceae family. Characteristically, the male plants produce leaves that are smaller than the females. A vast majority of individuals in the third world countries are not able to satisfy their nutritional requirements for growth and development. This leads to malnutrition, which is one of the major causes of death, particularly in infants and young children. Malnutrition can manifest as protein-energy malnutrition (PEM) and micronutrient deficiency. Micronutrients are involved in metabolism of energy nutrients and their deficiency may precipitate PEM as well as their specific deficiency diseases.

Despite the approaches on the past geared towards combating micronutrient deficiencies through supplementation in form of drugs, fortification of some food products and other measures, the problem still exists. This is because most people do not routinely take their supplements as they view it as drug and others abuse it as prescribed. Most of our fortified food products are costly and the poor in the rural communities and the low socio-economic groups cannot afford to purchase them. They depend on their cheaper and low micronutrient familiar unfortified products. The National Demographic and Health Survey (DHS) from 2008 indicates high levels of moderate to severe stunting in children under five years of age (41%) and moderate to severe wasting (14%). (USAID, 2011). Nigeria ranked 8th in the world in the prevalence of mortality rates of under-fives, with a staggering figure of 189/1000 in 2008 (WHO, 2007).

The World Health Organization estimates that approximately 150 million children younger than 5 years in developing countries are underweight and an additional 200 million children are stunted. Malnutrition contributes to Nigeria’s current health problems (morbidity and mortality) in several ways. Under nutrition remains a devastating problem in many developing countries affecting over 815 million people causing more than one half of child death (Ruel, 2003; Ukegbu, 2007, WHO, 2003). Vegetable are officially defined as edible roots stems, leaves and flowers. Vegetables are very important food and highly beneficial for the maintenance of good health and prevention of diseases (Odiaka et al., 2008). the healthiest foods, they are brimming with vitamins, minerals and other substance for body need and for optimum performance and robust immunity. Although, WHO, UNICEF and Nigeria’s National breastfeeding policy recommended that infants be exclusively breastfed from birth to 6 months and continue breastfeeding to 24 months and beyond for optimal survival, growth development unfortunately only 17% of infants under six months of age are exclusively breastfeeding Nigeria (FMOH, 2007). The poor breastfeeding and inadequate complementary feeding explained the protein energy malnutrition level in children as they grow older. Based on the diverse effects of vitamin A deficiency, it is important that preventive measures capable of combating these deficiencies be adopted, especially diversification of diets at the reach of the low income groups.

The inherent problem of micronutrient deficiency is very difficult to combat because as hidden hunger, it is not easily detected. An estimated 250,000 to 500,000 vitamin A deficient children get blind every year (Hussein et al., 2000). Half of them die within 12 months of loosing their sight. Nearly 600,000 women die from childbirth-related causes each year, the vast majority of them from complication which could be reduced through better nutrition, including provision of vitamin A supplements. Vitamin A deficiency (VAD) is the leading causes of malnutrition. Health and life seems to flow from the vegetable itself as water is the source of both life and health, freshness means being full of life. But when it comes to drying the freshness is all gone, transforming the iconic health food into a wrinkly, leathery and sometimes bone-dry substance, from carrying the signs of life. A vegetable is considered fresh only when it still retains its water Ndukwe, (2009), so fresh vegetable cannot be stored for a long period of time as the dried vegetables.

We call a vegetable fresh when its connection with life is actually just severed, when they have been recently picked from their branches. Once picked, time mercilessly flows to erode the freshness of a vegetable, making it slowly go bad. When this life line with the soil is cut, decay is imminent. are of mere advantageous than the fresh vegetables, because drying vegetable is a secret way to a second life for vegetable from the fresh product of vegetable that end it life. But a dried vegetable is not dead yet, drying is the start of a second life to vegetable. The tradition may have start from necessity to keeping vegetables for long winters, but now it is more of preference because of the intensified flavor and distinctive texture that can only be achieved by the drying process. The perfect time for drying is when the weather is hot and dry. So drying vegetables do not contain any chemical additives of processed foods, drying allows us to enjoy them longer without consuming the energy required for refrigeration or freezing.

As a result of these life threatening effects of vitamin A deficiencies, there is a need to adopt an intervention programme that would be within the reach of the low socioeconomic groups who are mostly affected. Dietary diversification using locally available foods within the communities appears to be a more feasible approach in rural communities than other approaches. The leaf of this crop can dry well, rehydrate easily and can be stored for long periods of time without being blanched e.g. Ugu leaf, Moringa leaf, cucumber, onions peppers, tomatoes,

potatoes and cocoyam leaf.

In Nigeria cooking, vegetables are used as accompaniment to stable food. They may be cooked along with in source, soup or stew and seasoning mix, vegetable can be added to them in dried or fresh form. Vegetable are of various kinds, this includes leaf vegetable fruit vegetable, root vegetable, miscellaneous vegetables and bulb. Common cabbage, uha, plant leaves as pumpkin or ugu leaves, spinach, lettuce, and okra. Fluted pumpkin, *Telfaria occidentalis belongs* to the family *Cucurbitaceae*. It is a creeping vegetative that spreads low across the ground with large lobed leaves, and long twisting tendrils (Horsfall and Spiff, 2005). It is usually supported with trellis during growth to protect the pod. It is of commercial importance in the lowland humid topics of West Africa (Nkang et al., 2003) and grown mainly for its leaves which are used as vegetable (Gupta and Prakash, 2009). The leaves are rich in protein, oil, vitamins and minerals, folic acid, calcium, zinc, potassium, cobalt, copper, iron, vitamins A, C and K but low in crude fibre (Ladeji et al., 1995). They are also rich in iron and have been reported to be useful in the treatment of anaemia (Alada, 2000). Chemically *T. occidentalis* leaf extract contains 18.76-21.31% crude protein, 2.50-6.41% crude fibre, 5.50 ether extract, 10.92% ash, total carbohydate 51.27%, β-carotene (41.09-47.3 µg g^{-1}, ascorbate 28 mg $100g^{-1}$ and 3121ME (kcal/kg) (Nworgu, 2007; Ifeoma, 2014). Aqueous extracts of *T.occidentalis* leaves have been tested in broiler starter feeds and the anti-nutrients present in the plants include phytic acid, tannin and saponin (Onu, 2012).

Ugu is a leafy vegetable which is used in Nigeria for both culinary and medicinal purposes. It is rich in minerals such as calcium, potassium, magnesium, iron and folic acid which makes it highly nutritious. It is also a good source of vitamins A, C and, k and lots of minerals. Researchers also found out that eating meals rich in fluted pumpkin leaves and seeds helps prevent Cancer, Improves blood count, Beats diabetes, reduce blood glucose and Cholesterol levels (Lucas, 1988). It is used for soups like Efo Riro, as accomplishment to Nigeria meals especially the fresh Ugu vegetable. Ugu vegetable can be cooked along with soup, sauce and seasoning mix. Ugu vegetable can be used in dried or fresh form and ugu vegetable can help to improve taste, appearance and aroma of food in cooking and it also help to build the body.

In seasoning, fresh vegetable product can be found enough in the garden and even in the market especially in the raining season. Making use of vegetable in season is very important. Vegetable grown in a fertile soil that is well drained. Sandy, loams are good as they are low in sulphur, which helps in management especially sweet onions crop. Elimination of this harmful environment element can be possible by vaporizing the excess water or drying fruits and freshly prepared ugu (pumpkin-*Telfaira occidentalis*) mixture containing ugu (pumpkin) fluid, raw content of egg and peak evaporated unsweetened milk administered orally is a popular haematinic regimen used to compact anemia in pregnant women in mission hospitals in Nigeria (Olaniyan and Adeleke, 2005).Similarly, the aqueous extract of *Telfairia occidentalis* has been shown to be hepatoprotective against garlicinduced oxidative stress (Olorunfemi et al., 2005) while its ethanolic extract have demonstrated hypoglycaemic properties both in normoglycaemic and alloxan-induced diabetic rats (Nwozo et al., 2004).

MATERIALS AND METHODS

Fluted pumpkin (Telfairia occidentalis) used for the study were purchased from kontagora market. Fluted pumpkin leaves were picked to remove stems, flowers, unwanted particles, washed in clean deionized water and divided into two equal portions. One portion was used fresh which served as control. The other portion was dried. The fresh and dried leaves was used to produce meals, such as soups, sauce and seasoning mix.

EGUSI VEGETABLE SOUP PREPARATION

Beef meat, ugu leaf (dried and fresh), dry egusi seed (melon seed)s 1 cup (milk tin) grounded, red pepper, onions, all other seasonings, palm oil 100ml, dry grounded Cray fish, bitter leaf, Water (H20).

PROCEDURE

Boil the beef meat with onions, salt, curry, thyme, magi cubes, water. A ground egusi seed with crayfish, which gives the soup a unique colour and flavor, ground until egusi seeds is smooth with the crayfish.
Wash the ugu and bitter leaf well in a clean, fresh water.
Blend the onions, tomatoes and pepper.
Add the dry grounded ingredients, pepper and fry in palm oil for five minutes.Add the water and cover the pot and cook for five minutes. Finally add all other ingredients and stir then leave for few minutes, and add the ugu, bitter leafy and allow to cook. Remove from heat and serve with pounded yam or eba
(www.allnigerianrecipes.com.hom/soups,stewsandsouces)

UGU SAUCE PREPARATION

Shredded ugu leaf, fresh pepper, tomatoes, onions, seasoning like magi, onga, vegetable oil, salt, curry.

PROCEDURE

Wash and cut tomatoes, onions and pepper, put

Table 1. Sensorial characteristic of fresh ugu and dried ugu leaves on selected prepared meals.

SAMPLE	TASTE	APPEARANCE	AROMA	GENERAL ACCEPTABILITY	SIMPLE MEAN
A1	2.53%	2.5%	2.6%	2.7%	40
A2	2.4%	2.4%	2.5%	2.6%	40
B1	2.65%	2.6%	2.73%	2.8%	40
B2	2.6%	2.5%	2.1%	2.43%	40
C1	2.93%	2.4%	2.7%	2.75%	40
C2	2.13%	2.4%	2.23%	2.4%	40

KEY:A1 – Fresh ugu vegetable soup, A2 – Dried ugu vegetable soup,B1 – Fresh ugu vegetable sauce,B2 – Dried ugu vegetable sauce,C1 – Fresh vegetable seasoning mix jellof rice,C2 – Normal jellof rice.

groundnut oil in a pot and not too much oil. Fry the blended pepper, tomatoes and onions for some time but do not allow it to dry, it must have a little sauce (water) inside. Add all seasoning. Add the thorough washed shredded ugu leaf. The tomatoes will not be much but the ugu leaf will be much. Stir and allow the cook for few minutes, then the sauce is ready to serve. By (http://www.allnigerianrecipes.com)

MIXED VEGETABLE JELLOF RICE PREPARATION

Rice 3 cups/750g, tomatoes carrot 5 medium sized, green beans, pepper to taste, salt to taste, onions 2 medium sized, seasonings, curry and thyme, vegetable oil.

PROCEDURE

Wash the rice in a cold water (optional) and boil for few minutes like 5 minutes.
Pure the rice content in a sieve in a bowl of cold water and allow the rice to drain out the water in a basket (sieve).
Rinse the rice and change the water if necessary and allow in the sieve to drain off all the water.
The preparation is also the same with jellof rice even the ingredient is also the same except carrot and green beans that are to be added.
When the water is almost dry, add the diced carrots, and cover the pot for few minutes.
When the water is completely dry, add the diced green beans vegetable and turn off the stove. Then turn the rice with a spoon and cover the pot for few minutes, by (http://busycook.about.com/library/recipes/b/spicemix.htm)

DATA ANALYSIS

The data was analyzed using simple meal count of likert scale. Total response of the respondent was calculated using simple mean of 40 respondents on liked-1, liked slightly-2, liked extremely -3 and disliked-4, disliked slightly-5, disliked extremely-6. The sample mean percentage was used to accept the research question:

$$\text{Sample mean percentage} = \frac{\text{sum of No of scale respondent on a characteristics} \times 100}{\text{Total No of respondents}}$$

RESULTS AND DISCUSSION

Telfairia occidentalis Hook f. (fluted pumpkin), is native to West Africa but occurs mostly in its cultivated form in various parts of southern Nigeria. It is a darkish green leafy vegetable popularly used in soup and folk medicine for the management of many diseases in Nigeria. The findings showed that the taste of fresh ugu vegetable is extremely accepted while (53%) of the respondents extremely liked the taste of fresh ugu vegetable, because when vegetables are used fresh, it still maintain the flavor which add a general taste to the soup, sauce and seasoning mix. This findings are in line with the findings of Shakuntala, (2001) and Anyankoha and Eluwa (1991), saying that when vegetable are used fresh it will ensure unique flavor of fresh ugu vegetable. Results showed from Table 1 samples that using ugu vegetable in meal cooking, the taste can help an individual's to have perceived sensation by the tongue on contact with the ugu vegetable in soup, sauce and seasoning mix.

The result of the findings also showed that the appearance of the ugu vegetable in soup, sauce and seasoning mix gives an impression and makes the food look very attractive to eat and the appearance of ugu vegetable can also help to stimulate the appetite of an individual. 26% of the respondents liked the appearance of ugu vegetable and also 26% of the respondents also liked the taste of dry ugu vegetable because it increase in quantity and it also has a good appearance.

According to Dennis and Robert (2005), sees aroma of vegetable product as a delicious smell obtained from the ugu vegetable whether fresh or in a dried form. The findings detected that most of the people liked the aroma of fresh ugu vegetable in cooking of the soup, sauce and seasoning mix jellof rice, and the dried ugu vegetable aroma is also preferable to some of the respondent,

where (2.1%) of the respond liked the aroma of dried ugu vegetable in soups and sauce and also seasoning mix.

Generally the result obtained from the analysis detected that ugu vegetable is well accepted especially the fresh ugu vegetable in times of soup, sauce and seasoning mix jellof rice.

Conclusion

The research found out that most people randomly accept the use of fresh ugu vegetable in preparing their meals at home more than the dry ugu vegetable due to the good taste, appearance and aroma added to the food by fresh ugu vegetables. From the finding, people should be using both forms of ugu vegetable in cooking of their dishes at home, especially when cooking soup, sauce and seasoning mix jellof rice. Families and eatries should not be depriving themselves, population from eating ugu vegetable because ugu vegetables are among the healthiest foods. They can be used as accompaniment when cooking food. Such as stable food or soup, sauce and seasoning mix.

REFERENCE

Anyankoha E, Eluwa M (1991). Home Management For School And Colleges. African Feb. Publishers United. Pp.12-34.

Alada A (2000). The haematological effect of Telfairia occidentalis diet preparation. Afric. J.Biomed. Res.3:185-186.

Agatemor C (2006). Studies of selected physicochemical properties of flutted pumpkin (Telfairia occidentalis Hook, F); Seed oil and Tropical Almond (Terminalia catappia L.) Seed oil. Pak. J.Nutr. 5(4):306-307.

Badifu GI, Akpapunan MA, Mgbemere VM (1995). The fate of betacarotene in processed leaves of fluted pumpkin, a popular vegetable in Nigerian diet plant foods. Hum. Nutri; 48: 141-147.

Dennis LJC, Robert S (2005). Food and Beverage service.printed Hodder Arnold. 6th edition.
pp. 120-121.

Esquinas-Alcazar JT, Gulick PJ (1983). Genetic resources of Curcubitaceae. Int. Board of Plant Genet. Resources. Rome. 4:67-70.

Federal Ministry of Health, (FMOH) Nigeria (2007). Integrated Maternal, Newborn and Health Strategy. Republic of Nigeria.

Gupta S, Prakash J (2009). Studies on Indian green leafy vegetables for their antioxidant activity. Plant Food Human Nutrition, 64:39-45.

Hopkins AJ (2001). Importance of leafy vegetables. A very, Atlanta.125-137.

Horsfall M Jr, Spiff IA (2005). Equilibrium Sorption Study of Al, Co, and Ag in Aqueous solutions by fluted pumpkin (Telfairia Occidentalis Hook f). Waste Biomass. Acta Chim. Slov., 52:174-181.

Hussein A, Odumeru JA, Ayanbadejo T, Faulkner H, McNab WB, Hager H, Szijarto L (2000) Effects of processing and packaging on vitamin c and b-carotene content of ready-to-use (RTU) vegetables. Food Res Int 33:131–136.

Ifeoma UO (2014). The effect of different processing methods on the proximate, β- carotene and ascorbate composition of fluted pumpkin (Telfairia occidentalis) leaves and its product, the leaf curd. Inter. J.Nutr, and Food Sci. 3(5):404-410.

Ladeji O, Okoye Z, Ojobe T (1995). Chemical evaluation of thrnutirive value of leave of fluted pumpkin (Telfairia occidentalis) Food Chemistry, 53(4):353-355.

Lucas EO (1988) The potential of leaf vegetables in Nigeria. Outlook on Agric 17:163–168.

Mensah JK, Okoli RI, Ohaju-Obodo JO, Elfediyi K (2008). Phytochemical, nutritional and medicinal properties of some leafy vegetables consumed by Edo people of Nigeria. Afr. J. Biotechnol. 7 (14) 2304-2309. Not cited in the body paper

Nwozo SO, Adaramoye OA, Ajaiyoba EO (2004). Antidiabetic and hypolipidemic studies of Telfairia occidentalis on alloxan – induced diabetic rats. Nig. J. Nat. Prod. Med. 8: 45-47.

Nworgu F, Ekemezie A, Ladele A, Akinrolabu B (2007). Performance of broiler chickens served heat-treated fluted pumpkin (Telfaria occidentalis) leaves extract supplement. African Journal of Biotechnology. 6:818-825.

Ndukwe MO (2009). Interpretation and recipe book on Home Management and Food and Nutrition.P.29.

Nkang A, Omokaro D, Egbe A, Amanke G (2003). Variations in fatty acid proportions during desiccation of Telfairiaoccidentalis seeds harvested at physiological and agronomic maturity. African Journal of Biotechnology. 2(2)33-39.

Onu P (2012). Effect of aqueous extract of Telfairia occidentalis leaf on the performance and haematological indices of starter broilers. ISRN Veterinary Science,P.4. doi:10.5402/2012/726515

Odiaka NI, Akoroda MO, Odiaka EC (2008). Diversity and production methods of fluted pumpkin (Telfairia occidentalis Hook F.); Experience with vegetable farmers in Makurdi, Nigeria. Afr. J. Biotechnol. 7(8):944-954.

Olaniyan MF, Adeleke A (2005). A study of the effect of pumpkin (Telfairia occidentalis) milk and raw egg mixture in the treatment of anaemic pregnant women in rural area Afr. J. Trad. CAM. 2(3):269 – 273.

Olorunfemi AE, Arnold CI, Emmanel O, Nkaima N, Akeem A (2005). Hypoglycaemic activity of Telfairia Occidentalis in rats. J . Pharm.Biores. 2:36-42.

Ukegbu E (2007). Exclusive breast feeding practices among caregivers in three selected LGA's of Gombe State, Nigeria. Proceeding of 41st Annual General Meeting and Scientific Conference of Nutrition Society of Nigeria, pp. 16.

USAID (2011) Formative assessment of infant and young child feeding practices federal capital territory, Nigeria; USAID's Infant & Young child nutrition project January 2011. Shakuntala MM, Shadaksharas WM (2001). Food facts and principles. By new age international publishers second edition. Pp. 76-77.

Ruel MT (2003).Progress in Developing Indicators to Measure Complementary Feeding Practices. In: SCN News. Meeting the Challenge to Improve Complementary Feeding, Moreira, A.D. (Ed.). United Nations System Standing Committee on Nutrition, Lavenhem Press, UK, pp: 20-22.

Tindal HD (1983). Vegetables in the tropics. McMillian Press. London.

WHO (2007). Indicator for assessing infant and young child feeding practices. Consensus meeting held in Washington D.C, USA Geneva.

WHO (2003). Global strategy for infant and young child feeding practices. Geneva: WHO.WHO/NHD/Verney and Nabarro (2003 int/nut/ida.htm.