

## Acceptance of Aerial Yam (*Dioscorea bulbifera* L.) for Food in Biu Emirate Council, Borno State, Nigeria

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### Abstract

Aerial yam is a semi-wild food that grows on vines climbing onto poles and trees. The bulb is eaten on peeling off the hard back after cooking. Questionnaire was administered to investigate its acceptance for food in Biu environ as well as its taste. Proximate analysis was carried out to determine its nutritive value. About 85% of the respondents eat aerial yam as a supplement to their major food or meals. The result shows that elderly people of 36 years and above (58.83% of respondents) eat aerial yam being a common resource and cheap in the dry season. The taste varied with individuals as 58.82% stated that it is tasteless; 17.66%, bitter and 11.76%, indefinite. The samples analysed gave an average of 32% DM; 3.61%, CP; 3.06%, EE or fat; 8.65%, CF; 1.33%, ash and 83.56%, NFE. The integration of aerial yam in cropping system is therefore recommended as it has such a nutritional profile and ease of production.

**Keywords:** Aerial yam, Consumption, Taste, Nutritive value.

### INTRODUCTION

The aerial yam is a bulb that grows on vines climbing onto poles and trees of fence lines of compounds in rural areas. It is a semi-wild food because it has never been “domesticated” or cultivated. The bulb has a hard back which is peeled off after cooking and the content eaten. Commercial development of aerial yam is virtually nil probably because the plant is only known in remote, normally poverty-stricken areas.

Even though there are limitations on the quantities of aerial yam which could be produced (for instance, the plants do not yield copiously) they can be relatively easily grown through “wild” propagation-without ploughing. An advantage is that the bulbs have long shelf life as they can be kept almost indefinitely for a later

use. The objective of this research is to understand the nutritive value of aerial yam for the awareness of its consumers to stimulate its full domestication, cultivation and commercialization as well as integration into cropping system.

## MATERIALS AND METHODS

### Study Area

Biu Emirate Council is situated in the southern part of Borno State, Nigeria. It comprises of five local government areas namely Bayo, Biu, Hawul, Kwaya Kusar and Shani. The climate of the area is characterized by wet and dry season. The rainy season is normally from May to October with mean annual rainfall of about 1,500mm with relative humidity of 42-49%(BOSG,2012). The area has a minimum temperature range of 15-20°C and maximum temperature range of 35-45°C (BOSG,2012).

The major soil types of the area are clay, clay-loam and loamy soils which is due to the parent materials and topography of the area (Kwari, 2005). The fertility of the land makes agricultural activities the major occupation of the people. The vegetation of the area is typical of the sudan savanna with fire tolerant trees such as *Parkia biglobosa*, *Butyrospermum paradoxon*, *Combretum* spp., *Sterculia* spp., *Diospyros mespilliformis*, *Adonsonia digitata* among others. Perennial grasses such as *Andropogon gayanus*, *Hyperhemia rufa* and *Panicum maximum* are common. Annual grasses include *Pennisetum pedicellatum*, *Setaria pallidifusca*, *Eragrostis ciliaris*, *Cymbopogon giganteus* and *Aristida* spp.

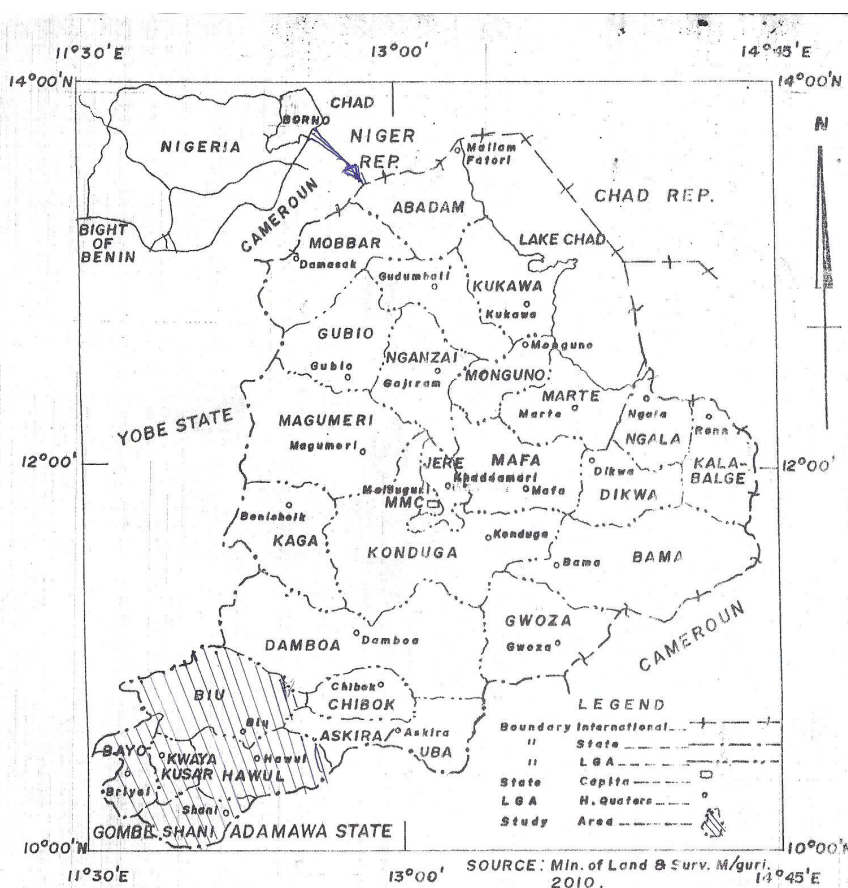


Fig. 1: MAP OF BORNO STATE SHOWING LOCAL GOVT. AREAS AND THE STUDY AREA

### Data Collection

Data on consumption of aerial yam was obtained through administration of questionnaire and in depth discussion as used by Nwangu (2003). One hundred (100) questionnaire were administered in Biu environ of Borno State, Nigeria. Questions asked were whether respondents eat aerial yam and their opinions on its taste.

Samples for proximate analysis were obtained in two localities (A-Residential Area and B- Abandoned Farmland).. The moisture content and dry matter were determined on a dry weight basis as described by Praveena *et al* (2001). Chemical compositions were assessed by performing chemical analysis to determine the crude protein (CP), ether extract (EE) or fat, crude fibre (CF) and ash using the AOAC (2002) method. The amount of nitrogen free extract (NFE) was calculated by difference.

### Data analysis

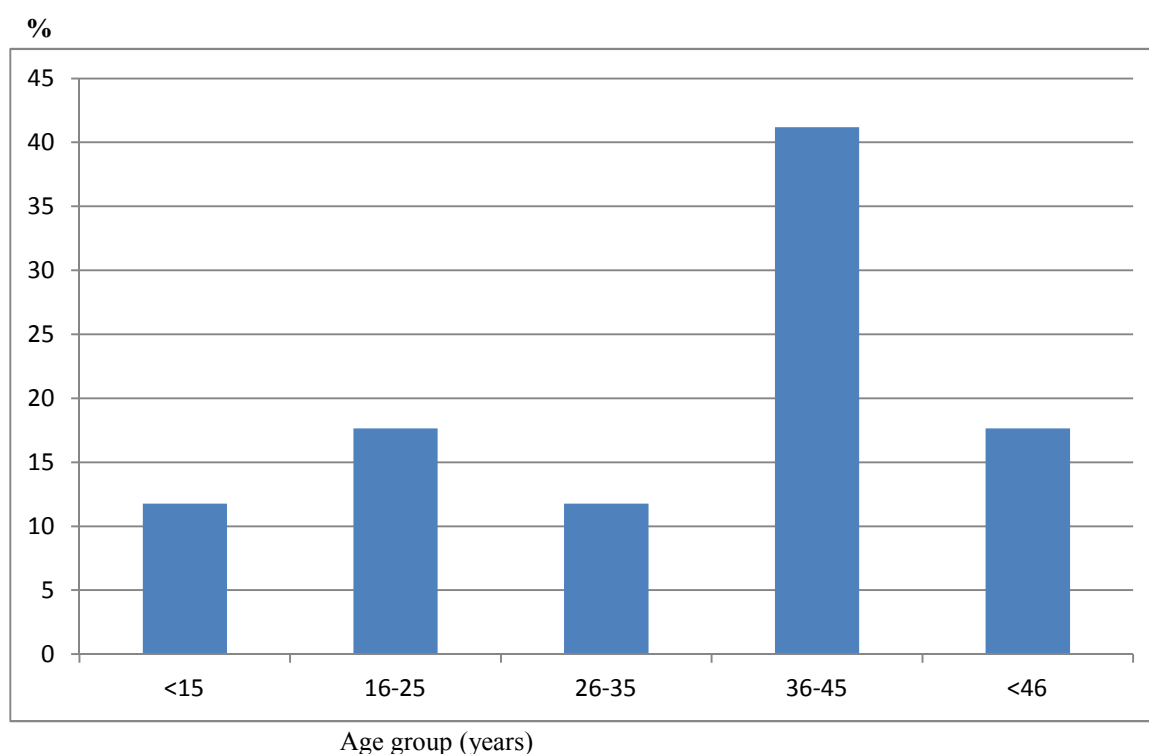
The data obtained were analysed using descriptive statistics in the form of percentages, charts and tables.

### Results

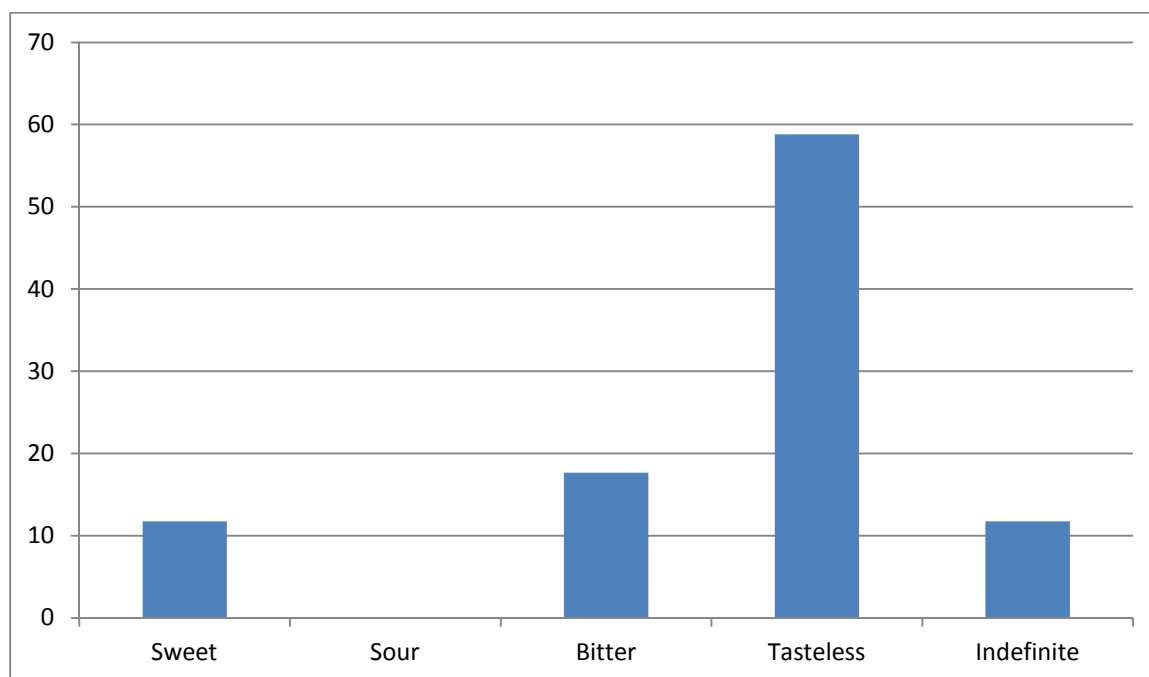
Aerial yam is eaten by 85% of the respondents as a supplement especially in the afternoon. Fig.2 shows that 41.18% of those that eat aerial yam in the area are of the age class of 36-45 years; 17.65% equally of those between 16-25 and above 46 years and 11.76% equally of those less than 15 and 26-35 years. The result shows that elderly people of 36 years and above made up 58.85% of aerial yam consumers in the area.

Respondents indicated that aerial yam is a common resource and cheap during the dry season (November-April). It is purchased in the rural markets and taken to urban centres by retailers. About 58.82% of respondents stated that aerial yam is tasteless; 17.66%, bitter; while 11.76% equally indicated that it is sweet and indefinite in taste (Fig. 3).

Table 1 shows the chemical composition of aerial yam obtained in two localities (A and B). There were moisture content of 68.54% and 67.46% in samples B and A respectively with a mean dry matter of 32.00%. there was an average of 3.61% crude protein (CP), 3.06% ether extract (EE) or fat, 8.65% crude fibre (CF) and 1.33% ash. Nitrogen free extract (NFE) or soluble carbohydrate is higher in sample B (83.88%) than in sample A (83.24%) giving a mean of 83.56% (Table 1)



**Fig.2: Percentage of respondents who eat Aerial Yam by age class.**



**Fig.3: Percentage of Consumers of Aerial yam on their views to its Taste.**

**Table 1: Chemical Composition of Aerial Yam(%)**

Sample	Dry matter	Moisture content	Crude protein	EE or Fat	Crude Fibre	Ash	NFE
A	32.54	67.46	3.76	3.00	9.00	1.00	83.24
B	31.46	68.54	3.45	3.12	8.30	1.25	83.88
Mean	32.00	68.00	3.61	3.06	8.65	1.33	83.56

## DISCUSSION

The acceptance and consumption of aerial yam in the study area by 85% of the respondents agrees with the FAO (1999) report that about 80% of the population in developing countries use wild plants of non-wood forest products to meet nutrition and health needs. The majority of the people eating aerial yam are the elderly group which suggest that it might have formed part of the diet of the Bushmen and is still commonly eaten by traditional communities where it occur mainly as snack. The conventional yam; *Dioscorea alata* and *D. Esculenta* which are widely cultivated are tubers known to contain about 18-20% starch are consumed mainly as energy giving food eaten as fried, boiled or baked (Chadha, 2009)..Aerial yam has been found in this study to be a high energy food (83.56% NFE) but is not cultivated as food crop. The processing methods of the conventional yam may conform with the level of its production.

The sellers of aerial yam are always found alongside with non-timber forest products (NTFPs) such as fruits of *Balanites aegyptiaca*, *Adansonia digitata*, *Ziziphus spina-christi*, *Z.mauritiana* and the like. Women and children are the major participants in this trade as reported by FAO (1995). Thus, aerial yam and indigenous fruit trees help women and children in rural households of the study area to secure food for their families either directly or indirectly aiding in poverty alleviation.

## CONCLUSION AND RECOMMENDATIONS

Aerial yam serves as supplement to meals and household income towards poverty alleviation especially at crucial moments at the ending and beginning of a year. It is also very rich in biotic flora complex around homestead in rural communities. It is a vital resource to the sustenance of the rural people and provides substantial employment opportunities. Marketing of aerial yam is mostly by women and children usually placed alongside with non-timber forest products (NTFPs) either by hawking in motor parks or placed on the ground waiting for buyers along major high ways or mini markets. This agrees with FAO (1995) and Agbigbi *et al* (2008) reports that women and children are involved actively in the provision of food security and family welfare in most communities worldwide, as they are also the main participants in NTFPs marketing.

The nutritional value of aerial yam suggests that it can be fully incorporated into the cropping system by farmers in areas where it is found to be adapted. There is need for more research on its chemical properties for possible other commercial development.

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