

# INGREDIENTS AND PROCEDURE FOR PRODUCTION OF “IGBA”, A TRADITIONAL FOOD PRODUCT MADE FROM AFRICAN YAM BEAN SEEDS: A SURVEY OF AKAGBE UGWU COMMUNITY EXPERIENCE

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## ***Abstract***

*A survey on the ingredients and procedure for “Igba” production in Akagbe Ugwu Community was undertaken. The survey revealed the ingredients as roasted African yam seeds’ flour, water, palm oil, salt and ground pepper. Also, the recipe per 1 painter: 5L by volume of roasted AYB seeds’ flour was 1 painter: 5L water, 1 Lucozade: 1L palm oil, 2-3 teaspoons of salt and 2-3 teaspoons full of pepper flour, or small quantity of fresh pepper. The procedure for “Igba” production involved the additions of the ingredients by individualized sequence and the thorough mixing to produce a doughy paste with deep orange colour. The paste is then wrapped into units using Napoleona imperialis leaves, and cooked overnight. The final product is sold hot. The “Igba” needs scientific touch and standardization.*

**Keywords:** *Igba, Ingredients and procedure of production of Igba Food Product*

## **Introduction**

Enugu State, Nigeria, is blessed with many traditional legume based vended foods and snacks. The source legumes include cowpeas, bambara groundnuts and African yam bean among others. Among the said traditional food are “mai mai”, or “elele” in Igbo or, moin moin in Yoruba, and “akara”, from cowpea (*Vigna unguiculata*), then “Okpa”

food product and roasted bambara groundnut seeds' snacks from Bambara groundnut (BGN) seeds. "Mai-mai", "Okpa" and "Igba" are ready to eat (RTE) gelled foods, while akara is a deep oil fried product from cowpea. "Igba" is produced from roasted AYB, *Sphenostylis stenocarpa* Hochst Ex A Rich Harms, which belongs to *Leguminosae* family, and *Papilionoidae* sub family (Enwere *et al*, 1990; Irvine, 1979).

African yam bean is an underutilized tropical bean (Bhat & Karim, 2009), indigenous to Africa (Anya & Ozung, 2019), has the hard to cook (HTC) phenomenon (Enujiugha *et al*, 2012) in addition to the presence of some anti-nutritive substances such as tannins, which affects the bioavailability of nutrients. Its Nigerian local names include "giri giri" (wanke) in Hausa, "Okpa odudu", "Ijiriji", "Azam", "ofi", "Odudu", "Nzamiri" in Igbo; and "Sese" in Yoruba, (Ogbo, 2002 and Enwere, 1998). According to Ndidi *et al* (2014), AYB is called "Majinga" in Southern Kaduna, Northwestern Nigeria. AYB as a legume has the potential to fight against malnutrition on account of its high protein, carbohydrate and minerals' contents (Abioye *et al*, 2015; Adewale, 2010; Adebowale *et al*, 2009). AYB is a leguminous plant occurring throughout tropical African and is one of the legumes that contain several biologically active compounds that possess health-promoting attributes against several life style diseases (Maphosa & Jidani, 2017). It is reportedly rich in bio-actives such as polyphenols and flavonoids that are important and beneficial for consumers to keep and maintain good living (Soetan *et al*, 2018; Ade-Omowaye *et al*, 2015). Polyphenols and flavonoids are widely distributed in plants, seed, tissues, fruits, tree bark roots, and stems of most plants. These compounds are active in scavenging free radicals. AYB can thus be consumed as prophylactic foods against diseases like *cancer, diabetics, high blood pressure, cardiovascular diseases* among other life threatening diseases (Maphosa & Jidani, 2017). "Igba" receives high patronage from various classes of people including heavy duty labourers, traders and parents by virtue of its use for food entrepreneurship in many communities in Enugu State including the Obeaghu, Akagbe Ugwu community in Nkanu west, LGA which is situated within **6.332407** latitude and **7.468168** longitudes. Despite the nutritional potentials of this AYB crop, it has zero industrial utilities at

the present time. Also, there is scarce information in literature on its food products utilization patterns. However Idowu, (2012) has reported of the production of AYB-WF biscuit. This survey is on the utilization patterns of AYB in the production of “Igba” food product as it occurs in Obeaghu, Akagbe Ugwu, Enugu State. It is expected that the information from this work will benefit users and entrepreneurs on the “Igba” food product, as well as throw some light on possible ways for AYB’s use industrially.

### **Materials and Methods**

Fully answered questionnaires were gathered from 85 respondents who were also indigenous “Igba” processors and user, and, resident in Obeaghu, Akagbe Ugwu, Nkanu West LGA Enugu State. The content of the questionnaires was divided into parts A and B, and were randomly administered to processors of the 4-6 quarters of Obeaghu, Akagbe Ugwu. The respondent’s consent was obtained by explaining to them that the information obtained would be used for research purposes only. Part A of the questionnaires was for individual’s documentation including sex, age group and the age of the “Igba” production enterprise while section B covered such issues like AYB seeds’ variety, “Igba” processing main ingredients, recipe, spices and condiments, sequence of ingredients-addition during mixing, type of packaging materials, cooking duration, storage duration before inception of spoilage and other AYB utility issues.

### **Results and Discussion**

The results obtained from the survey were summarized on Table 1: AYB varieties and production procedure of “Igba” food product. The “Igba” enterprise has existed for upwards of forty (40) years; the 21-30yrs age group (young school leavers) amounted to 48.23% of the processors, 32.94% were of the 31-40yrs age group while 36.47% of the respondents were of the 41-50yrs age group. Below 20 years and above 50yrs age group were 2.35% each of the respondents. The local names of the AYB in Obeaghu locality included “Igba”, “Uzuaki”, “Ikpakpara”, “Azam”, “Ata aghumiri” “Odudu” and “Ata

agbarufuanya”. “Ata aghumiri” implies that the product demand additional water intake from its consumers than for other foods. 100% of the respondent agreed that four AYB seeds’ colours namely, brown, red, white and black seed coated variants were used for “Igba” production, however the brown coloured seeds were the first choice for all the respondents.

**Table 1: AYB varieties and production procedure of “igba” food product**

S/N	Parameters assayed	Results obtained							
1.	Age groups of processors	20yrs <20 =2/85	21-30 41/85	31-40 28/85	41-50 8/85	51-60y 2/85	>60y	>60y Age group Not stated	
2.	Age of “Igba” production enterprise	1-5yrs	6-10yrs	11-15	16-20	21-25	>50y		
3.	(i) Local names of AYB and colour assession of the AYB seeds colour mostly available	(i) Igba, Uzaki, Ikpakpara, Azam, Ata aghumiri, Odudu, Ata agbarufuanya, Azimu, Ohihi							
	(ii) Number of varieties by colour assession	(ii) Brown, White, Black and Red							
	(iii) Variety mostly used for Igba production	(iii) Brown – 80/85. However 3 respondents did not mention Brown at all							

Abioye *et al* (2015) and Adeyeye (1997) reported of the existence of 4-9 AYB variants. The major and optional ingredients and the recipe for “Igba” production are itemized (see Fig 1). Though 100% of the respondents agreed on the stated ingredients (Roasted African yam bean flour: 1 painter (3.2-.3.5kg), 1 painter of water (5L water), salt: 2-3 dessert spoonful (20g), pepper: 2 dessert spoonful (7-8g) and palm oil: 1 Lucozade bottle (1L) and recipe, variations existed on the amounts of some specific ingredients especially in the additions of palm oil, water and the common salt. 94.12% (80 persons) used 1L of palm oil per painter (5L by volume) AYB roasted flour for producing a batch of “Igba” while (4 persons), 4.71% and (1 person) 1.18% respectively used 2 bottles and 3 bottles of palm oil respectively, per

painter of roasted AYB flour for “Igba” production. It may be safe to conclude that generally, the processors used 1L of palm oil per painter of roasted AYB flour. Anything more than 1 Lucozade bottle of palm oil was not economical for the processor since cost of production would be higher and so the size of the unit “Igba” food products would be smaller, per unit price which could attract consumers’ complaints and unwillingness to buy the products. Due to poor estimation skills, some processors agreed to have used 1 painter of water when there would be unquantified remnant water in the 5L container. The story is the same for common salt. The respondents also reported that “modernization” mostly due to customers’ desire had led some processor into the use of some optional ingredients originally foreign to the process. Indicted ingredients included scent leaves, *Ocimum gratisimum*, “ugu” leaves, *Telferia occidentalis*, onions, *Allium cepa*, maggi cubes, and crayfish *Astacus fluriatilis*, designated SL, UL, On, Mc and Cr respectively. 25.88% (23) of the respondents stuck tightly to the core traditional recipe while 62 respondents, 74.12% used traditional recipe with a brush of modernization. These 74.12% respondents added singly or combination of SL, UL, On, Mc and Cr. The mostly used optional ingredient was Mc by 68.24%, while 63.5% of respondents used onions. 54.12% and 2.35% of the respondents used scent leaves and “ugu” leaves respectively. Also 2.35% of the respondents used crayfish, (animal product). All these will bring about variation in the chemical quality of “Igba”, an evidence of non-standardization of the “Igba” food product.

***Major ingredients and recipe:***

Roasted AYB flour – 1 painter 3.2kg -3.5kg

Water – 1 painter (5L water)

Salt – 2-3 spoons = 20g

Pepper – 2 spoons = 7g

Palm oil – 1 lucozode full bottle = 1L

***Optional ingredients:***

Scent leaves

“Ugu” leaves  
Onions  
Crayfish

**Figure 1: Major and Optional ingredients**

**Sequence of addition of the ingredients**

- Option 1: To Igba flour, add palm oil and mix. Then add water and mix. Lastly add the pepper and salt, then mix/stir thoroughly. Wrap the mixture and cook.
- Option 2: To Igba flour, add water and mix, then, add palm oil and mix thoroughly. Lastly add the pepper, salt and mix thoroughly. Then wrap the mixture.
- Option 3: Mix pepper and salt with water, then add the Igba flour and finally mix with palm oil, then wrap the mixture and cook.

Option 1 was used by 3.53% of the respondents (frequency: 3/85). Option 2 was used by 54.12% of the respondents (frequency: 46/85). Option 3 was used by 42.35% of respondents (frequency: 36/85). The doughy deep orange coloured paste produced from the mixing stage is then wrapped into small units, and cooked. 100% of the respondents used natural leaves: “ukpodu”, *Napoleona imperialis* to wrap and the wrap was tied with palm frond leaves or twine. Cooking was done in a pot containing adequate volume of potable water and fueled with firewood and palm kernel husks. No respondent used kerosene stove or gas cooker. 100% of the respondents agreed that the cooking was done overnight. However 24.7%, 45.88% and 5.88% of the respondents agreed that the effective cooking time were 3h, 2h and 1h respectively. 20 respondents (23.53%) could not estimate the effective time. On the question on how to confirm that “Igba” unit had been properly cooked, 67.06% of the respondents agreed that the processor would pick wraps from the boiling pot, cut open the hot “Igba” and confirm that the centre of the product had gelled. 14.11% of the respondents agreed that the processor would dip clean dry kitchen knife through the wrap into the “Igba” and if the knife came out clean without pasty covering, then the product was considered properly cooked. However 7.06% of the respondents agreed that the peculiar aroma of cooked “Igba” and possible

dark cooking stock in the pot were the signs for properly cooked “Igba” while 11.76% left that question unanswered. End of cooking process to obtain properly cooked “Igba” was achieved through experience. The processors who were also the respondents sold the freshly cooked “Igba” soon after production. Unsold products were either re-heated daily, or stored on the chimney or refrigerated. 9.41% of the respondents preserved the “Igba” left-over products by re-heating, while 64.70% of the respondents preserved by refrigeration and 4.70% of the respondents stored the left over “Igba” products on top of their kitchen chimneys. However 21.18% (frequency: 18) of the respondents did not state their method of preserving the un-sold “Igba” product.

In terms of storage and microbial stability of the Igba food product 37, 6 and 5 of the respondents being 43.53%, 7.06% and 5.88% respectively, agreed that the cooked products would grow slimy between one day and 2 days storage. This calls for research. In terms of the major sensory attribute that made “Igba” acceptable, 8.24% of the respondents agreed that the deep palm oil colour of the inner part of the “Igba” influenced the consumer acceptance of the “Igba” food product while 15.29% agreed that flavor from scent leaves influenced acceptance of the “Igba” product. Surprisingly 61.18% of the respondents accepted the product based on instincts or other unstated attributes. Definitely this local product is asking after standardization. Concerning the question on the dark colour of the “Igba” product all the respondents agreed that roasting was responsible for the superficial dark colour. Responding to the *challenges that the processors/respondents experienced on the “Igba” production, their responses were:*

- (i.) Too much stress. The process consumed very long times from start to finish
- (ii.) Challenge of “ukpodu” leaves scarcity implying that there's need for sourcing other packaging material.
- (iii.) Small profit: 58.18% (frequency: 49), i.e., poor profit was obtainable
- (iv.) Customers’ complaints on size. Customers desired larger “Igba” product for the price they paid.

(v.) 10.59% left the question unanswered

The frequency of “Igba” production per week ranged between once weekly to four times weekly. 1.18%, 28.23%, 31.76% and 8.23% produced “Igba” once weekly, twice weekly, thrice weekly and for 4 days per week respectively. 20% of the respondent did not state the frequency of their productions per week. When asked to suggest ways of improving the “Igba” product, 15.29% of the respondents agreed that “Igba” could be made better through some processing techniques; however 77.65% of the respondents agreed that no better ways for change was needed especially because of the claims of nourishment and medicinal benefits from “Igba”. All the same 7.06% of the respondents did not answer the question. 5.49% of the respondents agreed that *cancer* was prevented or-controlled through the “Igba” consumption. *Liver problem, diarrhea* and *stomach problem* on the one side, as well as *malaria* and fever on another side were cured or controlled to which 9.89% and 25.27% respectively agreed to. Through personal communication, the cooked AYB stock was credited with curing Hepatitis (jaundice in adults) within six weeks of daily consumption of the cooked AYB stock. In terms of the claims of lowering or curing *high blood pressure*, 64.83% of the respondents credited the good effects of “Igba” while 80.22% of the respondents credited “Igba” as able to lower blood sugar and cure diabetes. Generally, “Igba” food product was good for nourishment. AYB has been reported to be of importance in the management of chronic diseases like Diabetes hypertension and cardiovascular diseases because of its high dietary fibre, (Abioye *et al*, 2015). Furthermore George, *et al*, (2020) reported that the starch of AYB is good for diabetic patients because of the slow digestion properties of the AYB starch. Additionally, the presence of no-starch polysaccharides in AYB e.g., cellulose, hemicelluloses and arabinose lowers the risk of cardiovascular diseases, cancers and coronary heart diseases

## **Conclusion**

The survey has shown that Igba food product is produced from roasted AYB seeds’ flour mixed with water, palm oil and spices. *Napoleona imperialis* natural leaves is used for wrapping the dough past resulting from the mixing and the wraps are boiled for up to two hours before the cooled Igba product can be eaten. The flour from roasted brown

AYB variety is the preferred variety for “Igba” production in Akagbe Ugwu Community. There are also claims to its nourishing and health benefits.

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