

Full Length Research Paper

Perception of food quality in yams among some Nigerian farmers

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Yam, a staple and ceremonial crop is intimately integrated into the socio-cultural, economic and religious customs of several West African communities. This study presents a qualitative investigation of the perception of food quality in yams by farmers. Food quality in the yam tuber is significant in determining its utilization (both at subsistence and industrial level) and acceptability of yam's food products by farmers, processors and consumers to ensure sustainable food security. Focus group discussion (FGD) was used to collect data from farmers in two major yam-growing ecological zones of Nigeria namely: Federal Capital Territory (FCT- Abuja) and Oyo North in Oyo State. Results showed that farmers do not have definite food quality indicators in the yam tubers that can determine or predict the quality of the product. Indigenous knowledge such as pattern of leaf foliage, smoothness and shape of the tubers are used to identify species and varieties rather than for predicting food quality. Farmers' perception of food quality in yams is mainly determined by the sustainable income derivable from cultivating particular species or varieties and also, on the sensorial quality of the yam product (textural quality). There is need for researchers to involve farmers in food quality studies as a form of holistic approach in achieving improved food quality.

Key words: Yam, food quality indicators, perception, culture, food security.

INTRODUCTION

Food quality is the combination of attributes or characteristics of a product that are significant in determining the degree of acceptability of the product to the user. These attributes include nutritional value (actual: Nutrients and anti-nutritional factors and non-actual: Those perceived by the consumer), microbiological safety, convenience, stability, cost and sensorial (texture, appearance, flavour and aroma) (Waldron et al., 2003).

Food quality in yam can be defined as those quality attributes such as physico-chemical composition (granule morphology, pasting properties, swelling, water binding capacity of yam starch), nutrient composition (proximate,

minerals, vitamins), and anti-nutritional factors (phytates, tannins, saponins and oxalates) in the yam tuber. These parameters are significant in determining utilization and acceptability of yam food product by all stakeholders (farmers, processors and consumers) to ensure sustainable food security. Although Nigeria is the largest producer of yam in the world (FAO, 2002) its utilization is still limited to subsistence level. In order to break out of this subsistence mode, it is important to characterize land races in Nigeria in terms of their industrial potential, food quality and end use suitability. This would require the inputs of both researchers and farmers. However, these two key players differ in their view on food quality of yam tubers since food quality often means different things to different stakeholders throughout the food chain. Farmers are the primary producers of yam, a very important component in the food chain. In order to promote breeding of yam for good food quality it is important to

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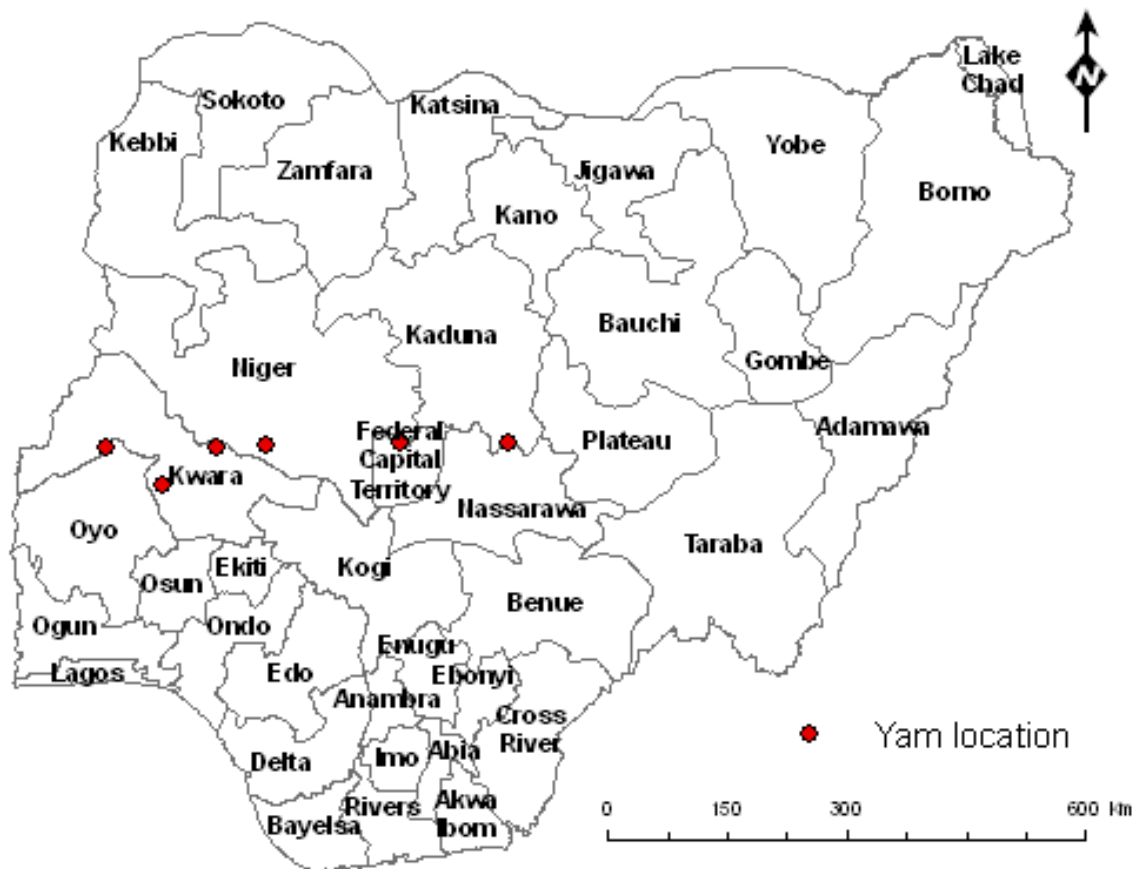


Figure 1. A map of Nigeria showing the sites of yam production and data collection.

know how and what farmers regard as food quality in yam. This will enable researchers carry out effective selection of varieties with variable food qualities and industrial potentials, expand the utilization of yam product, improve its market value and increase income for all the key players (farmers, processors and consumer). This study was therefore designed to assess the farmers' perception of food quality in yams to provide baseline information on which yam germplasm that was needed for characterization of yam land races in terms of their food quality and end use suitability in Nigeria was selected.

METHODOLOGY

Survey area

The study was carried out at two major yam producing communities in Nigeria: FCT, Abuja (Paikokore- Latitude 8°59'N long 7°2'E and Dobi- Latitude 9°4'N longitude 6°53'E) and Kishi (Budo Gawe and Budo Sanni - Latitude 7°40'N longitude 4°11'E) representing transition between forest and savannah ecological zones. These two areas were selected based on their widespread yam farming and marketing activities. The two areas also have different cultural backgrounds. The villages where survey was carried out are shown in Figure 1.

Survey method

Focus group discussion (FGD)

Focus group discussion (FGD) and key informants were used to collect focused and consistent qualitative information for the study (Rubin and Rubin, 1995). According to Morgan (1996) focus groups are used when there is a difference in perspective between researchers and those who they need to work with (e.g. farmers) on a topic of interest to the researcher and also used to obtain several perspectives about the same topic. FGD provides insight into what the group thinks about an issue, about the range of opinions and ideas. It also explores people's beliefs, attitude and options. For this study, the groups were constituted through contact farmers who helped to inform the farmers about the study and got their consent to participate in the discussion. These contact farmers acted as the key informants which enabled the researcher to get pre-existing groups. The participants in the FGDS were homogeneous in that they shared common characteristics, understanding and were related in social and cultural background. Discussions dwelt on issues of farmer's attitudes, beliefs and perception about food quality in yams. A total of 40 respondents participated in the FGDs in the two study areas. They were mainly male farmers and marketers. The main purpose of FGDs in this study was to draw upon farmer's attitude, feelings, beliefs and perception on food quality in yams.

FGD was used to probe the following issues of interest:

1. The various species and varieties of yam that are being

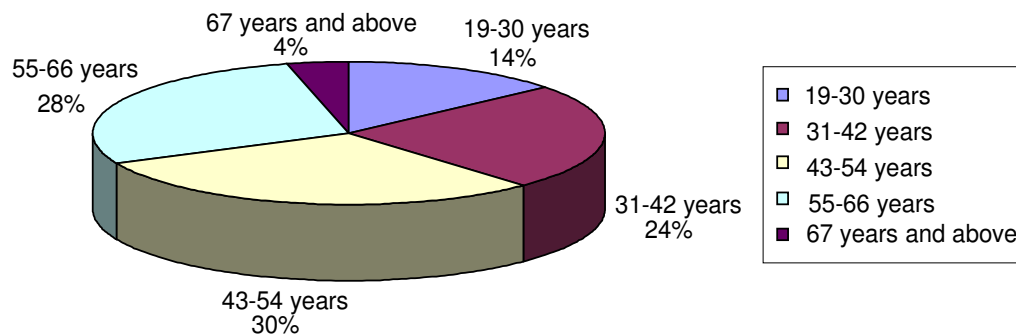


Figure 2. Age distribution of the farmers.

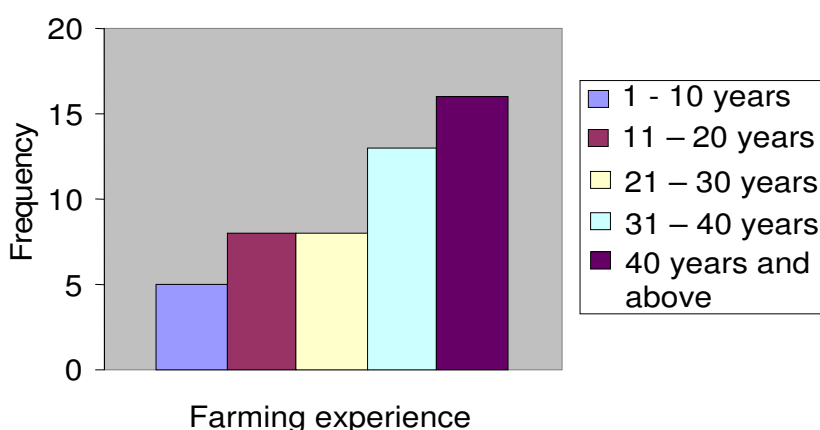


Figure 3. Farming experience of the farmers.

cultivated in the area and why they are being cultivated.

2. What are the food products that they produce from these species?

3. Why are they using particular specie for a particular product (that is, reason for their preference for the species and the product)?

4. What is their perception of food quality in yams?

5. What is the most important food quality attribute in yam food products?

6. How do they identify food quality in the yam tuber?

7. Do they look for a particular property or attribute in the fresh yam tuber in other to prepare the product, example skin color, shape, smoothness or roughness of the skin, surface of the tuber, and tubers with strands, in order to predict its food quality?

A total of four (4) focus group discussion sessions were held in the study areas. Two were held at Painkonkore and Dobi in Gwagwalada Local government area of FCT, while the remaining two were held in Budo Gawe and Budo Sanni, Kishi in Irepodun Local government area of Oyo State. The number of participants in each session of the FGDs was restricted to between eight and ten to ensure copious discussion of the issues and matters arising from them (Macintosh, 1993; Gross and Lembach, 1996). FGD in Paikokonre and Dobi were held at the central marketer's yam barn while those of Kisi and Budo Bani were held at a popular farmer's relaxation joint in the evening time and the village square respectively.

The discussions were held in Hausa and "pidgin", the common languages in the FCT area. This was translated to the researcher in

English language by an interpreter. The discussion in Kisi was held in Yoruba language while that of Budo bani was into Tiv language and interpreted in Yoruba to the researcher. These languages were used in order to make the discussion appealing, interesting and to gather as many useful information as possible. Each session lasted between 30 and 45 min. Participants were assured of confidentiality of their views and the data were also anonymised. The discussion was moderated by extension workers while the researcher took note and recorded electronically. The recorded discussions were played, transcribed, analysed, thematic approach was used to analyse and report the qualitative information.

RESULTS AND DISCUSSION

Socio-demographic data

All the farmers were males and 90% were married. Their age range is shown in Figure 2. About 60% had no formal education, 24% primary, 6% secondary, 2% tertiary education, and 20% went to Arabic school.

Their farming experience varied: 32% had been cultivating yams for 40 years and above, 26% for about 31 - 40 years, 16% for 11 - 30 years and 10% for less than 10 years (Figure 3). Farmers in both areas reported

that the source of capital for their farm is from personal savings. There was a general consensus that the size of their farm depends on the amount of capital they had, this in turn determined the quantity of species and varieties of yam that they cultivated. All the farmers cultivated other crops such as rice, maize, cassava and sorghum in addition to yam. Generally, the farmers classified the size of their farm in terms of the number of heaps they made from the land. In Oyo North, the size is classified in terms of financial yield from the crops. They used local terms such as: "Igba" (200 heaps) "Ofa" (1,200 heaps), "Sile" (4,000 heaps) and "Naira" (40,000 heaps). From the FGD discussion, it was found that the farmer's farming experience in yam cultivation affected the perception of food quality in yams. This was because most of the farmers determined the food quality in yam food product based on the years of experience they have had with planting or cultivating the specie or variety.

Types of species and varieties of yam being cultivated

The species, varieties and characteristics of the yams collected in the two areas are described in Tables 1 and 2. In FCT area, the major species is *Dioscorea rotundata* and *Dioscorea alata* to a small extent, but in Oyo North *D. rotundata* and *D. alata*, *Dioscorea dumentorum* and *Dioscorea bulbifera* are cultivated. In the two areas, what determined the type of yam farmers cultivate were: Commercial value and yield, suitability of the variety for the best yam food product, the agronomic yield of the variety.

Farmers' perception of food quality

All the farmers groups were unanimous in what they believed as food quality in yams. They believed that, if the varieties within the species are suitable to produce the chief food product from the yam, then it is of good food quality. It was the general consensus of the FGD participants that the chief product from yam is pounded yam, and that if the yam can be made to produce pounded yam of good textural quality (Smoothness, stretchability, and cohesiveness, moderately adhesive and moderately soft) then it has good food quality. The colour of the pounded yam was secondary to them in that it will only make the pounded yam to be appealing. The farmers from Oyo North generally believed that if a variety of yam is not good for pounded yam, it should be good for yam flour (elubo), If it does not fit into any of these products then it does not have good food quality.

The farmers believed the yam is of good food quality if varieties within the species have good commercial value, that is, it can generate sustainable derivable income to them since the demand for that particular variety will be

very high and hence it will generate more income if the yam is good for the best food product derived from it. This is seen in Tables 1 and 2 where the farmers described the characteristics of the yam that they plant and they rated these yams in terms of their food quality based on this.

Yam tubers are stored principally to ensure availability during the hunger period of the year (November to June) and to provide seed for the next planting season. The farmers reported that stored yam tubers usually command higher price in the market than the fresh ones. In addition, most consumers of pounded yam usually prefer it to be made from stored yam tubers on the basis of textural quality rather than that made from fresh yam tubers. Thus, if they cannot store the yams for a long time, the income derived will not be as high and profitable as the one from another variety that has good storability, hence they rate such yam to be of low food quality.

The farmers in Oyo North where varieties of yam species are planted apart from *D. rotundata* believed that for *D. alata* to have good food quality, it should be a good substitute to *D. rotundata*; hence it should be good to eat as boiled or, pounded yam after storage as well as for yam flour (elubo) thus sustaining them during the hunger period of the year.

A very interesting discovery from this study was that even if the yam has a high agronomical yield, the farmers do not regard it as a good food quality index once it has low commercial value. For instance in FCT area, "Lagos" is a variety of *D. rotundata* that has high agronomical yield but is not good for pounded yam, hence it is poorly rated in terms of its food quality because it does not have high commercial value.

The farmers also reported that they could not predict food quality of the yam variety before harvest. They only base their prediction on farming experience they had over the years with a particular variety. They unanimously agreed that factors like skin color depend on the soil on which the yam is planted and cannot predict food quality. Shape, hair strands, smoothness or roughness of the tuber, design and shape of the leaves are only used to identify a particular variety while canopy cover can only indicate the agronomical yield of the yam and not food quality.

Conclusion

From the result of the survey, it was adduced that farmers do not have definite food quality indicators in the yam tubers that can determine or predict the quality of the product. Indigenous knowledge such as pattern of leaf foliage, smoothness and shape of the tubers are used to identify species and varieties rather than predicting food quality. Farmers do not place premium on nutritional value or potential industrial utilization of yam; they perceive food quality in terms of the commercial

Table 1. Species, varieties and *characteristics of yam cultivated in FCT area (Painkokonre and Dobi).

Species	Characteristics	Source	Best food product	Food quality rating
<i>D. rotundata</i>				
Danacha	High commercial yield because it is good for pounded yam	Paikonkore/Dobi	Pounded yam, boiled yam	Very good
Ameh	High yielding, high commercial yield, good for pounded yam when stored because it is waxy when freshly harvested	Paikonkore/Dobi	Boiled, pounded yam,	Good
Akwuki	Not high yielding	Paikonkore/Dobi	Pounded yam	Fair
Pepa	It is called paper because of the colour (According to the farmers 'it is white as paper') big tubers, high yielding, smooth body, mealy, when boiled but not good for pounded yam	Paikonkore/Dobi	Yam flour (Elubo) boiled yam, fried yam,	Fair
Gwari	High commercial value, good for pounded yam, colour white like pepa hence it is used for elubo	Paikonkore/Dobi-FCT	Pounded yam, yam flour (Elubo)	Good
Lagos	High yielding, not good for pounded yam (good for pounded yam only if the water used to cook it is used), not sweet, little commercial value, high yield	Paikonkore/Dobi	Pounded yam	Poor
Suba	Early maturing, high commercial value, hard tubers, very good for pounded yam	Paikonkore/Dobi	Pounded yam	Very good (rated 2 nd to Yangbede variety in terms of good food quality)
Yangbede	Early maturing, high commercial value, high yielding, excellent for pounded yam (in the farmers' word: 'The pounded yam swell well well'), hard tubers (low moisture content)	Paikonkore/Dobi	Pounded yam	Excellent (regarded as best yam for pounded yam in this area)
Godiya	High commercial value, good for pounded yam	Paikonkore/Dobi	Pounded yam	Good
Coach	High commercial value, good for pounded yam	Paikonkore/Dobi	Pounded yam	Good
Maillemu	Good for pounded yam, body of the tuber is very smooth that is why it is called 'Maillemu' (body smooth like orange) good market value	Paikonkore/Dobi	Pounded yam, boiled yam, fried yam	Very good

Table 1. Contd.

Meccakwsa	Very high commercial value, high yielding, big tubers (Meccakwsa means that your pilgrimage to Mecca is assured because you will have enough money to embark on the pilgrim through the sale of this variety) good for pounded yam	Paikonkore/Dobi	Pounded yam	Very good
Ogini	High commercial value, good for pounded yam (ogini means what is it?) originated from the Eastern part of Nigeria	Paikonkore/Dobi	Pounded yam	Good
Mumuyi	High commercial value, good for pounded yam	Paikonkore/Dobi	Pounded yam	Good
<i>D. alata</i>				
Sharma bulu	Big flat tubers, smooth, cream, good for boiled yam	Paikonkore/Dobi	Boiled yam	Good
Sharma gadagba	Big flat tubers with large fingers, smooth, cream, good for boiled yam	Paikonkore/Dobi	Boiled yam	Good

*The characteristics were described by the farmers.

Table 2. Species, varieties and *characteristics of yam cultivated in Oyo North area (Kisi: Budo Sani and Budo Gawe)

Species	Characteristics	Source	Best food product	Food quality rating
<i>D. rotundata</i>				
Early maturing		Kisi		
Ofegi	Extra-early maturing, the tubers are slim with cream colour.	Kisi	Pounded yam	Good
Kuna	Tuber is white in colour good for pounded yam	Kisi	Pounded yam	Good
Ajinlaja		Kisi	Pounded yam	Good

Table 2. Contd.

Lasinrin	High commercial value, high yielding, very good for pounded yam, colour is yellow	Kisi	Pounded yam	*Excellent (rated to have the best food quality among the early maturing yams)
Aro	High commercial value, high yielding, very good for pounded yam, colour is white	Kisi	Pounded yam	Good
Ehuru	High commercial value high yielding, very good for pounded yam, colour is white	Kisi	Pounded yam	Very good
Boki	High commercial value high yielding, very good for pounded yam, good storability.	Kisi	Pounded yam, boiled yam,	Good
Intermediate maturing yams		Kisi		
Ajelanwa	High commercial value	Kisi	Pounded yam, boiled yam, and fried yam.	Good
Kokuno	High commercial value	Kisi	Pounded yam, boiled yam, and fried yam.	Good
Agbawobe	Very big tubers , very high commercial value, high yielding, needs big heaps boiled tubers are very mealy	Kisi		*Very good (rated next to lasinrin to have the best food quality among the intermediate maturing yams)
Dariboko	High commercial value high yielding, very good for pounded yam, colour is white	Kisi		
Late maturing yams		Kisi		
Amula	Very high commercial value, high storability, white tubers	Kisi	Pounded yam	Excellent

Table 2. Contd.

Agunmoga	Big tubers, good commercial value	Kisi	Pounded yam	Good
Omi –efun	Good commercial value, cream coloured tubers	Kisi	Pounded yam, yam flour (Elubo)	Good
Gbebukari	Good commercial value,	Kisi	Pounded yam	Good
Danacha	Big tubers, very high commercial yield because it is good for pounded yam	Kisi	Pounded yam	Excellent
Zaria	Big tubers, high commercial yield because it is good for pounded yam	Kisi	Pounded yam	Very good
Jibo	Good commercial value, slim tubers	Kisi	Pounded yam	Very good
Gbongi	Big tubers, high commercial value, good storability	Kisi	Pounded yam boiled yam	Very good
Ihobia family: Kangan, Gbinra, Monrin, Korondo.	High commercial value, Multiple tubering, small size, very hard tubers than the varieties used for pounded yam	Kisi	Yam flour (excellent varieties for Elubo)	Very good
<i>D. alata</i>				
Ogun awatan	High yielding long tubers, colour is cream, late maturing yam, good commercial value	Kisi	Boiled yam, yam flour (elubo) pounded yam (after storage)	Good
Olesunle	Sweet mealy tubers, colour is cream, good commercial value	Kisi	Yam flour (elubo), boiled yam, pounded yam (after storage)	Fair
Emi	Hard tubers, good commercial value	Kisi	Yam flour (elubo)	Fair
Keso funfun and keso pupa	Hard tubers not good for eating	Kisi	Yam flour (elubo)	Fair
Babalaseje	Colour is cream	Kisi	Boiled yam	Fair
<i>D. cayenensis</i>		Kisi		

Table 2. Continued.

Alakisa	ellow tubers (alakisa means as dirty as a rag it is called alakisa because of the colour) good commercial value	Kisi	Pounded yam	Good
Saja		Kisi	Pounded yam	Good
Igangan	Hard tubers, yellow in colour, high commercial value very good for pounded yam	Kisi	Pounded yam	Very good
<i>D. dumentorum</i>		Kisi		
<i>Esuru pupa</i>	Brown tubers, multiple tubering	Kisi	Boiled yam	
<i>Esurufunfun</i>	White flesh tubers, multiple tubering	Kisi	Boiled yam	

*The characteristics were described by the farmers.

value, sustainable derivable income from cultivating a particular variety/species and suitability of yam for its best food product (pounded yam). The food culture and cultural belief of people about a particular specie or variety of yam largely influenced what they produce and market.

In view of this finding, agriculture extension services is needed in order to enlighten or encourage the farmers on what food quality is, and the need to gear their production towards planting for food quality (nutritional, commercial, industrial, and utilization) rather than for subsistence use only. There is need for researchers to involve farmers in food quality studies as a form of holistic approach in achieving improved food quality. This type of qualitative study can also be applied to different types of crops and food products globally.

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