

## **Traditional Preparations and Uses of Maize in Nigeria**

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### **ABSTRACT**

Maize is a cereal plant that produces grains that can be cooked, roasted, fried, ground, pounded or crushed to prepare various food items like pap, 'tuwo', 'gwate', 'donkunu' and host of others. All these food types are readily available in various parts of Nigeria among different ethnic groups, notably among which are Yorubas, Hausas, Ibos, Ibiras, Ishas, Binis, Efiks, Yalas etc. Preparations and uses of the maize grains varied from group to group, though at time with some similarities. Apart from food, maize is also useful as medicines and as raw materials for industries. About 28 food items or dishes and 6 medicinal values of maize are discussed with aim of making available the divergent methods of preparations of maize from various ethnic groups.

### **INTRODUCTION**

Maize (*Zea mays* L., Poaceae) is the most important cereal in the world after wheat and rice with regard to cultivation areas and total production (Purseglove, 1992; Osagie and Eka, 1998). The name maize is derived from the South American Indian Arawak-Carib word *mahiz*. It is also known as Indian corn or corn in America (Kochhar, 1986; Purseglove, 1992). It was introduced into Nigeria probably in the 16<sup>th</sup> century by the Portuguese (Osagie and Eka, 1998). In Nigeria, maize is known and called by different vernacular names depending on locality like 'agbado', 'igbado' or 'yangan' (Yoruba); 'masara' or 'dawar masara' (Hausa); 'ogbado' or 'oka' (Ibo); 'apaapa' (Ibira); 'oka' (Bini and Isha); 'ibokpot' or 'ibokpot union' (Efik) and 'igumapa' (Yala).

The global production of maize is estimated to about 300 million tones per year. 145million (or about 50 per cent) are produced in USA alone (Ihelarouye and Ngoddy, 1965; Kochhar, 1986; Purseglove, 1992). In Nigeria, its production is quite common in all parts of the country, from the north to the south, with an annual production of about 5.6million tones (Central Bank of Nigeria, 1992). The country's maize crop covers about 1million hectare out of 9million hectares it occupied in Africa (Hartmans, 1985).

Maize is prepared and consumed in a multitude of ways which vary from region to region or from one ethnic group to the other. For instance, maize grains are prepared by boiling or roasting as paste ('eko'), 'abado', and 'elekute' in Nigeria and 'kenke' in Ghana, or as popcorn which is eaten all

over West Africa. Traditional methods of preparations uses of maize are restricted to definite localities or ethnic groups. This trend was also noted in the traditional preparation and uses of cassava (*Manihot esculenta* Crantz, Euphorbiaceae) by Etejere and Bhat (1985). The current investigations on the traditional preparations and uses of maize by various ethnic groups in Nigeria is to make available differ methods of preparations and uses to all people.

## **METHODOLOGY**

Three methods were used in collection and collation of data. These include oral interview of local people of different ethnic backgrounds, field trips to some areas where maize is used in making porridges or dishes, and consultation of relevant literatures.

### **Preparations and uses as food**

Maize is an all-important crop which provides an avenue for making various types of foods. It also has some medicinal values and serves as raw-materials for many industries. Grain is the most important part of maize crop. It is put to many uses.

#### **Pap**

There are two popular paps in Nigeria; hot-pap and cold-pap. Hot-pap is known as 'eko-gbona' or 'ogi' (Yoruba), 'akamu' (Ibo and Yala), 'kamun' (Ibira) while cold-pap is 'eko-tutu' (Yoruba), 'kamu' (Isha), 'agidi' (Ibo and Yala), 'kafa' (Hausa).

To prepare paps generally, the maize grains are soaked in cold water inside earthen pot or clay pot ('koko') for 2 to 3 days. Then the grains are washed with clean water severally and later ground to paste. Water is added and leave for days with change of water at interval. At this stage, amount desire may be taken, stirred and poured inside boiling water and stirred until a semi-liquid porridge (hot pap) is obtained. In some cases, little grains of guinea corn (*Sorghum bicolor* (L.) Moench, Poaceae) are mixed with grains of maize, or guinea corn alone or millet (*Pennisetum americanum* K. Schum, Poaceae) alone may be used to prepare hot-pap (Banigo and Muller, 1972) just as described above. New improved processing system of manufacturing or preparing 'ogi' was discussed by Banigo et al. (1974). 'Ogi' is synonymous to tea among the indigenous Nigerians. 'Koko' is another thin porridge similar to 'ogi' except that it contains tiny lumps of flour to add texture.

Preparation of cold-pap is differs a little. After the grinding of the grains, the ground paste is filtered using clean, white cloth to get very smooth paste. The residue of filtration (called 'eri' by Yoruba) is used to feed animals. It may also be sun-dried to make 'pete' by Yoruba. This is poured in boiling water preparatory to making of 'amala' (a food prepared with yam flour (*Discorea* spp. like *D. rotundata* Poir, *D. cayenensis* Lam, *D. alata* L., Discoreaceae). Meanwhile, remaining fine paste after filtration is allowed to settle down at the bottom of pot with water on top. The top water which is called 'omi-eko' or 'omikan' or 'omidun' is removed while the paste is poured in boiling water and stirred to get a semi-solid porridge. This is then put inside banana leaves (*Musa* spp. L., Musaceae), or 'ewe-eko' as called by the local people which are arranged inside a small clay pot (kolobo) to give a characteristic doomed shape. Alternatively, it may be put inside polythene paper (nylon) – a recent phenomenon. The hot is allowed to cool down and solidified, and thus become thick porridge (i.e. cold-pap). 'Omadidi', which is popular among Isha people, is similar to 'eko' or 'eko'-tutu but more

solid than the latter. There is a slight difference in its ('omadidi') preparation. The half-cooked watery porridge is poured inside nylons at desire amount and re-cooked inside a pot containing hot water, this make it more solidified than eko.

Major difference between hot-pap and cold-pap lies in the states they are taken or served. While 'ogi' and 'koko' are served hot, eko and 'omadidi' are served cold. Generally, paps may be taken alone or with sugar or with bean cakes i.e. 'akara' or 'moin moin' (made from *Vigna unguiculata* (L.) Walp., Papilionaceae) or with vegetable stew (e.g. *Amaranthus cruentus* L., Amaranthaceae) or with ground nut cake, 'kulikuli' (made from *Arachis hypogaea* L., Papilionaceae). A bye product of pap called 'eha' or 'eha-koko' (this is burnt porridge at the bottom of the pot) is eaten by man and livestock.

### **'Tuwo'**

'Tuwo' (Yoruba), 'tuwo-masara' (Hausa), 'oka' (Egun), 'inioka' (Ibo), 'uka apaapa' (Ibira) is a very important and popular staple food among various ethnic groups in Nigeria. Its preparation seems to be similar among all groups though with minor differences. To prepare 'tuwo', testa of the grains is removed by grinding gently inside mortar with pestle. Small water is added to the grains to enhance testa removal. This is then sun-dried. In some localities, the testa is not removed. Dried grains are then ground with local grinding stone ('olo') or with grinding machine to obtain a smooth, whitish paste. Clay-pot containing water is put on a local stove-'aro' which made of three stones and fueled with firewood (e.g. *Vitellaria paradoxa* Gaertn. F., Sapotaceae). When water is hot enough, the paste is poured in it and stirred with stirring-stick ('orogun') to make a thick porridge food ('tuwo'). Tuwo is taken with bean soup ('gbegiri') or with 'luru' or with 'kubewa taushe' or with vegetable soups like sesame (*Sesamum indicum* L., Pedaliaceae), okra (*Abelmoschus esculentus* [L.] Moench., Malvaceae), celosia (*Celosia argentea* L., Amaranthaceae) etc.

### **'Donkunnu'**

'Donkunnu' is an exotic food to Nigeria. It was introduced to Nigeria from Ghana probably by the emigrant Ghanaians or by Nigerians lived in Ghana. The first option is more likely to be because at most joints of 'donkunnu', the Ghanaians are the sellers. It has become a popular food among middle aged Nigerians. To prepare 'donkunnu', maize grains are soaked for about two days in cold water. Soaked grains are then ground wet paste and leave in this state for about two days to ferment. The purpose of which is to bring out the characteristic sour taste of the finished product. A desire amount or quantity of fermented paste is put inside maize husk and cooked inside pot until thick, solid porridge ('donkunnu') is obtained. 'Donkunnu' is eaten with pepper stew (i.e. soup made up of mainly coarsely ground pepper- *Capsicum annum* L., Solanaceae and tomato- *Lycopersicon lycopersicum* Mill., Solanaceae) and fried fish.

### **'Maasa' and 'Wainna'**

'Maasa' and 'wainna' are similar thick porridges. While 'maasa' is small in size, 'wainna' is big. 'Maasa' is eaten with sugar sprinkled on it, 'wainna' is eaten with pumpkin soup (*Cucurbita pepo* L., *C. moschata* [Duch.ex Lam.] Duch. ex Poir, Cucurbitaceae) or with vegetable soups or with honey. Both are made with coarsely, wet-ground grains. Small piles of this are put separately into a frying-pan containing hot groundnut oil (or palm oil- *Elaeis guineensis* Jacq., Arecaceae, as commonly

used among Isha people) to 'maasa'. 'Wainna' on the other hand is prepared by putting some quantities of ground paste inside saucer plates (made of clay soil). The saucer plates are lubricated with groundnut oil initially to enhance easy removal of 'wainna' after heating or cooking. 'Wainna' cakes can also be made with mixture of cassava flour (*Manihot esculenta* Crantz, Euphorbiaceae) and millet flour (Lancaster et al., 1982; Etejere and Bhat, 1985).

#### **'Cous cous'**

Grain testa is removed before the grains are ground into powdery flour which can be preserved inside bag, and stored in a dry place until time to use it. At intervals, a required quantity can be measured out and mixed with ingredients like sliced tomato, pepper and onion (*Allium cepa*, L. Alliaceae). All these are cooked together. After sufficient cooking, the mixture (i.e. 'cous cous') is solidified and ready for eating.

#### **'Akple'**

The Ibo mix cassava flour with maize flour together with onion chips, chilies, and palm oil, and moulded into small balls that are deep in red palm oil. The balls are called 'akple' (Etejere and Bhat, 1985).

#### **'Ukejuka'**

This is cassava flour popular among the Ibirá people. It is a combination ('ejuka') and maize ('apaapa') flours. 'Ukejuka' is prepared like 'tuwo' by pouring the flour inside boiling water and stirred until it becomes semi-solid porridge. It is eaten with vegetable stew.

#### **'Gwate'**

'Gwate' is preparing like the 'cous cous'. While the 'cous cous' is solid, 'gwate' is semi-solid porridge. Unlike the 'cous cous', ingredients like pieces of soft-bones, meat, amaranth (*Amaranthus* spp. L., Amaranthaceae) or bitter leaf (*Vernonia amygdalina* Del., Asteraceae) and 'efirin' (*Ocimum* spp. L., Lamiaceae) are mixed with the flour and cooked to make 'gwate'.

#### **'Nakia'**

Moistened flour is moulded into small round objects which are fried with vegetable oil. 'Nakia' is eaten with honey or sugar.

#### **'Dambu alubosa'**

Grains are ground into dry, coarse particles that resemble 'gari' (a foodstuff prepare made from cassava tuber. The particles are mixed with oil and vegetable leaves e.g. *Amaranthus* spp.(like *A. cruentus* (L.) Sauer, Amaranthaceae) and cooked.

#### **'Abari'**

Fresh grains are washed with clean water to remove dirties. Onion and pepper are added to the grains and ground together with local grinding stone or with mortal and pestle or with grinding machine. Then palm oil and salt are added to it to turn red and to taste respectively. Desire quantities are measured out and put inside banana leaves or empty milk tins, and cooked with heat of hot water inside a covered pot to become solid porridge ('abari' 'iroo'[Yoruba], 'elili-oka'[Ibo], 'ekefi'[Isha]. 'Abari' may be eaten alone or with paps-hot and cold.

#### **'Egbo'**

Grains are cooked intensely until they become very soft and burst open (i.e. 'egbo'). It may be

eaten in this form or with cooked beans or cooked groundnut and/or coconut (*Cocos nucifera* L., Areaceae) and with little groundnut oil. 'Egbo' is called 'isoka' by the Isha people. The former is not as hard as the latter.

### **'Donkwa'**

This is a mixture of dried-ground groundnut and maize with or without addition of 'kakandoro' to prevent dysentery. The mixture is moulded into small ball shapes (i.e. 'donkwa' or 'dodonkwa'). It is known by the Isha as 'emumu'. The difference is that sugar and at time small pepper is added to the mixture of groundnut and maize flour to make 'emumu'.

### **Popcorn**

Locally, there are two types of popcorn- hard and soft. The former is simply called 'guguru' while the latter is 'guguru alakuko' by the Yorubas. Popcorn is made by putting maize grains inside a saucer-shaped earthen pot containing sand, and heated with firewood. The heat generated by the hot sand roasted and changed the colour of the whitish grains to brownish (i.e. 'guguru'). Further heating bursted the grains to reflect the internal whitish parts, this called 'guguru-alakuko'. The name is synonymous with the cock's comb (the cock is called 'akuko' by the Yorubas). Sometimes, honey or sugar may be added to 'guguru' to become 'guguru-oloyin' (honey or any sweet object is called 'oyin' by the Yorubas). Popcorns may be eaten alone or with roasted groundnut.

### **'Ajepasi'**

Maize grains are ground with water to moistened paste which is moulded into rippons, and fried with groundnut oil. Fried ribbons are maize cakes (i.e. 'ajepasi').

### **'Aadun'**

Grains are roasted and then ground into powdery particles. This is mixed with palm oil which make it to be solidified, or to clump together.

### **'Kokoro'**

'Kokoro' is also produced in a similar way like 'aadun' by roasting, kneading, spicing and frying. This method is described by Adegoke and Adebayo (1994).

### **'Elekute'**

Dried grains are roasted with hot-charcoal and ground into fine particles. Small amount of granulated sugar is added to it to become 'elekute'.

### **Cooked or boiled maize**

Whole freshly harvested maize fruit is cooked or boiled until the seeds are soft and eaten on the cob.

### **Roasted maize**

Whole freshly harvested maize fruit is roasted with hot-charcoal over a wire-gauze until the seeds become brown. It is eaten in this form on the cob.

## **MEDICINAL USES**

A crop which is highly edible and nutritious as maize, also has some medicinal uses among the local people. It is used to cure many diseases, which it had over the years proved to be very effective. These include:

1. Water filtered through charcoal obtained from maize stalk can be used as a treatment to cure gonorrhoea (AbdulRahaman, 1997).
2. An infusion obtained from stigma of maize inflorescence can be used for treatment of diseases of the urinary tract or passage (AbdulRahaman, 1997).
3. Water (i.e. 'omi-eko' or 'omikan' or 'omidun') obtained during the preparation of pap is used to soak bark or root of some plants (e.g. 'dokita igbo'). This is used to treat fever and malaria. Water obtained from the cold-pap is more effective than that from the hot-pap.
4. Cold-pap or 'eko-tutu' is used more often in traditional medicines. It is mixed with some preparations (usually granulated, black particles) to cure some spiritual problems. It may be prescribed to provide protection against enemies, bad occurrences or to foster posterities.
5. Holes are created or made in some maize grains to make rosary. This is put on the hand (wrist) of a child to prevent him or her from becoming slim.
6. Whole dried maize fruit and dried yam with some charms are planted or buried together. This preparation is done to unite or bind couple together with effect that either of them cannot remarry to another person. It means that they will remain husband and wife forever.

## CONCLUSION

Maize is a plant which grown on a wide variety of soil ranging from fairly coarse sand to the Heaviest of clay (Kochhar, 1986), and thus it is found in all parts of Nigeria. This opportunity must be harnessed to the maxima. Even though, maize is chiefly a carbohydrate reached food, it contains a sizeable amount of proteins (Table 1), minerals (Table 2) and vitamins (Table 3). It therefore means that it is a complete food for low level income people. Osagie and Eka (1998) reported that maize is the second most important cereal crop in Nigeria ranking behind sorghum in the number of people it feeds. Adequate and accurate information on this all-important plant is very relevant and must not be localized.

Meanwhile, the findings contained in this paper are believed to be an eye-opener to those traditional preparation methods and uses of maize that are restricted to some localities which are not known to other groups of people.

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**Table 1.** Amino acid composition of maize grown in Nigeria

S/n	Amino acid	Amount (g per 100g protein)
1.	Argentine	3.20
2.	Cystine	1.70
3.	Histidine	2.60
4.	Isoleucine	4.40
5.	Leucine	18.90
6.	Lysine	1.50
7.	Methionine	2.10
8.	Phenylalanine	6.60
9.	Threonine	3.50

10.	Tryptophan	0.40
11.	Tyrosine	5.20
12.	Valine	5.50
13.	Alanine	10.10
14.	Aspartic acid	7.20
15.	Glutamic acid	26.40
16.	Glycine	3.10

Source: Ekpenyoung et al. (1977)

**Table 2.** Mineral composition of maize grain in Nigeria (dry weight basis).

S/n	Mineral	Amount (mg/100g)
1.	Calcium	2.20
2.	Potassium	757.00
3.	Magnesium	377.00
4.	Iron	5.30
5.	Manganese	2.10
6.	Copper	0.80
7.	Zinc	0.38

Sources: Olaofe (1988); Osagie and Eka (1998)

**Table 3.** Vitamin composition of maize grown in Nigeria (values on dry weight basis).

S/n	Vitamin	Amount
1.	Vitamin A (I.U.)	510.00
2.	Thiamin (mg/100g)	0.38
3.	Riboflavin (mg/100g)	0.11
4.	Pantothenic acid (ppm)	8.00



5.	Niacin (mg/100g)	2.00
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Source: Oyenuga (1988)