

PLANTAINS AS FOOD IN NIGERIA

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Summary :

In Nigeria plantains are fried, boiled, baked and even consumed as a beverage after processing. They are a staple food and major source of carbohydrates. Recently, they have attracted the attention of researchers, as is clear from a look at the scientific literature published in the last 5 years. Studies of ways to process and store plantains are under way throughout the country, particularly in the south where the crop is grown. The efforts need to be directed toward involving local women who do virtually all the processing and marketing of the crop.

Plantain and cooking bananas belong to the family Musaceae and the genus *Musa*, tree-like perennials, 2-9 m tall, with an underground rhizome. They can be differentiated by the number of fingers on a bunch — a characteristic used in naming the fruits in many parts of southern Nigeria (Ogazi, 1980).

They are high in carbohydrates, containing about 35 % carbohydrate, 0.2-0.3 % fat, 1.2 % protein, 6.0-7.0 % fibre and 0.8 % ash. They are also a good source of potassium, magnesium, phosphorus, calcium and iron as well as vitamins A and C (Jaffe et al., 1963 ; Marriott and Lancaster, 1983). During ripening, the starch component is gradually converted to sucrose, glucose and fructose, and the water in the pulp increases.

In Nigeria, they have been popular for many years and are an ingredient in many traditional recipes. Both green and ripe fruits are boiled alone or with legumes, tomatoes, etc. ; sometimes they are pounded into a paste known as « fufu » or cut into slices and fried in palm oil. They can also be roasted or baked as « boli ». Unripe plantains are used in chips or sticks, and the ripe ones are prepared as « dodo », mashed plantain.

Another popular method of preparing and preserving the unripe plantain is the production of flour : the fruit is sliced, sun-dried on cement slabs and then ground into a fine powder (« elubo ogede »). The flour is used in gruel and eaten with vegetables or okra soup. Sometimes, the flour is mixed with either yam or cassava flour, both of which are more expensive than the plantain flour.

Champion (1970) described a method of making beer from ripe plantains in some East African countries. The plantain is picked green, allowed to ferment, then peeled and mixed with grass to remove the juice. Honey is added and the mixture allowed to ferment again for 1-2 days.

In the river towns of Nigeria, a similar potent beverage called « ogogoro » is made from ripe plantains. For a long time, this drink was banned in Nigeria, the argument being that there was no quality control and people could die from drinking it. Its production and sale have now been legalized.

In towns and villages around the University of Ife, a nonalcoholic drink called « sekete » is made from ripe plantains, which are peeled and soaked in water for 2-3 days then sieved. The liquid is bottled and the slurry discarded. Women carry out most of the processing at the home and village level as well as the marketing.

Because of the popularity and nutritional value of the plantain, national researchers and their institutions have begun to investigate ways to increase the usefulness of the crop.

RESEARCH ON UTILIZATION AND STORAGE

At the Nigerian Institute for Horticultural Research, Ibadan, research efforts have concentrated on refined methods of producing plantain chips, flakes, and flour (Ogazi, 1980).

Researchers at the food and home science departments at the University of Nigeria, Nsukka, have collaborated with the crop science department to identify the nutrient changes in stored plantains (Awan and Ndubizu, 1978).

At the Department of Food Technology of the University of Ibadan, Olorunda and his group are working on the keeping quality of processed plantains. He (Olorunda, 1976) reported that the storage life of mature and unripe plantain was increased at ambient temperatures when the plantains were stored in polyethylene bags, with or without ethylene absorbent. He concluded that the presence of ethylene absorbent delayed ripening of the fruit.

More recently, Olorunda and Aworth (1984) demonstrated that a surface coating agent (Tal pro-long) could increase storage life of plantains, delaying colour development (ripening) by 4-8 days. Also, Olorunda and Tung (1984) reported that slices of ripe plantains treated with calcium and frozen (-18°C to -20°C) were firmer and lost less fluid when thawed than did frozen, untreated controls. Fluid loss is associated with tissue damage after thawing of the plantain slices. To improve quality during long-term storage Olorunda and Tung (1984) suggested the use of dehydrofreezing.

The University of Ife group reported data on the nutritive value of plantains (Omole et al., 1978). They concluded that plantain protein was as good as maize protein and decidedly better than that of cassava. More recently, work in the Home Economics Program of the Faculty of Agriculture has involved the collection and testing of plantain recipes for a cookbook. Work on the effect of the tannin contained in beverages made from plantains will commence soon.

In my opinion, much work needs to be done on extending the storage life of plantains. Experiments to find optimal frying temperatures and processing times for different varieties of plantains need to be undertaken as do stu-

dies on packaging for fried plantain chips, sticks, and chunks for longer shelf-life. Also studies on the preservation of plantain beverages are necessary.

The present mode of sun-drying in the open air exposes the product to dirt and damage from insects and bacteria. A more effective, hygienic drying method is needed. A simple-to-construct platform that sits on wheels and includes a removable (or hinged) cover and handle for carrying would be suitable (Figure 1).

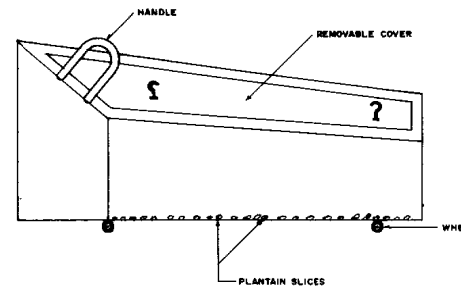


Figure 1 — COMPONENTS OF A HYGIENIC TRAY FOR SUN-DRYING

The potential for finding improved techniques is good and the chances of disseminating them are also good if researchers involve appropriate groups of users. One possibility is to draw on women who are involved in community development projects. For example, in Isoya Rural

Development Project, which comprises 13 villages, women, organized into cooperatives to sell mainly kola nuts and palm oil, confessed that they derived considerable income from selling plantains and flour from plantains.

These women would be an ideal base for a project to expand utilization and processing of plantains. Plantains are grown in the area, and the women are aware of the value of plantain as a source of income. At the introduction stage, training would be needed because most of these women are illiterate. Perhaps, the network at the University of Ife, Faculty of Agriculture, could be used to acquaint these women with new techniques as well as monitoring their progress.

A day or week's training could be introduced at the International Institute of Tropical Agriculture in Ibadan for a sharing of information on processing, marketing, and uses of plantain ; it would allow women — villagers, researchers, and scientists alike — to gain from one another. Even uses not familiar to the Nigerian populace, like plantain cakes with legume fortification, could be introduced.

Local methods of processing plantains and cooking bananas are not hygienic, but they are intrinsically good. Some changes can be effected to ease the labour at the village level and to improve the quality of the pulp, partially processed, and cooked plantain. Most of the operations involved in processing and marketing of plantains are carried out by women. Thus, they are the audience for results of related research. Any new technique or equipment that simplifies production should be simple and cheap for operation.

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