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## Sensory Evaluation of Some Cooking Bananas in Ghana

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**Abstract:** To assess consumer acceptability of the new cooking banana hybrids, a study was conducted to compare consumer preference for Saba, Yangambi KM 5, FHIA 25, FHIA 03, BITA 3 and *Apantu* (control) for chips, *Kakro*, *Ofam*, *Ampesi* and fried ripe plantain. A total of twenty trained male and female taste panelists were involved in the study. Panelists were presented with coded samples of five recipes prepared from the hybrid cooking bananas. Plantain chips are deep-fried thin slices of fruits. Fried plantains are thick slices of peeled ripe fruits that are dipped into salted water and fried in vegetable oil. *Ampesi* is the local name for boiled green plantains. *Kakro* is made with blended over-ripe fruit of plantains mixed with corn flour (about 30%), powdered chilies, salt and other spices. The paste thus formed is molded into balls and fried in vegetable oil. *Ofam* is blended over-ripe fruits, mixed with powdered chilies, other spices, salt and palm oil and baked in an oven to form a cake. The results indicated that KM 5, BITA 3 and FHIA 25 were highly preferred when fried at stages 3 and 4 of ripening. Saba and FHIA 03 were also accepted though not as high as the other three accessions. All accessions were highly preferred when used as chips. BITA 3 was highly preferred for *Ampesi* whereas KM 5 and FHIA 25 were partially preferred as *Ampesi*. Saba and FHIA 03 were totally rejected. However when used for *Ofam*, all the varieties were highly preferred. Cooking bananas could be highly preferred by Ghanaian consumers when processed. The processing might have coated the banana characteristics of the varieties.

**Key words:** Plantain, hybrid, cooking banana, sensory evaluation, *Musa*

### INTRODUCTION

Plantains and bananas are valuable starchy staples in Ghana. They provide not only a rich source of dietary energy (Stover and Simmonds, 1987) but also contribute to providing good quality diet and rural income (Ortiz and Vuylsteke, 1996). The nutrient for which bananas are known, potassium, revitalizes muscle power; help maintain body fluid balance and mental function ([www.turbana.com.indox.htm](http://www.turbana.com.indox.htm)). Plantains and bananas are used as *Fufu*, *Ampesi* and as snack. They could also be processed into *Tatale*, *Kakro*, chips, pastries, flour and *Abetie*. Recently bananas are being used for fruit juice.

All the plantain and banana cultivars in Ghana are susceptible to black Sigatoka disease and other pests except a cooking banana. The fear that the disease could wipe out the susceptible cultivars, efforts are being made to prepare for any eventuality. New hybrids, resistant/tolerant to the disease have been introduced into the country. Two of the hybrids that have been evaluated and accepted by consumers were released to farmer.

Cooking banana is not common among the Ghanaian dishes. There is only one known cooking banana in

Ghana. However in a recent informal survey conducted in some districts in the Volta, Greater, Central and Western regions, the local cooking banana was being grown in backyards and harvested a hand per week while still on the tree. The cultivar produces about fourteen hands and harvesting takes about thirteen weeks.

It also came to light during the evaluation of hybrid plantains and bananas Ghana that the processed cooking banana (FHIA 03) was accepted. This study was carried out to evaluate some hybrid cooking bananas, process them and assess their acceptance by the consuming community.

### MATERIALS AND METHODS

Mature fruits of FHIA-25, FHIA-03, SABA, Yangambi KM5 and BITA 3 were used for the sensory evaluation. One landrace plantain (*Apantu*) was used as the control. Five local dishes were prepared. They included *Ampesi* and chips from the green stages and *Kakro*, *Ofam* and Fried ripe plantain were prepared from the ripe samples.

**Ampesi:** *Ampesi* was prepared by peeling the green fruits with kitchen knife. The pulp was boiled for between ten

and fifteen minutes. Well-cooked pulp was determined by the water absorption and the softness. The initial pulp firmness of the accessions was low so they were not allowed to boil for long. The local cultivar was however boiled for about thirty minutes. The boiled pulp was then eaten with sauce (palaver sauce).

**Chips:** Chips were prepared from the green pulp. The pulp was thinly sliced vertically or transversely. The slices were fried in vegetable oil. The fried slices were dusted with salt and served.

**Kakro:** *Kakro* was prepared using the over-ripe pulp. The pulp was blended and mixed with between 30-50% corn flour, powdered chillies, salt and other spices. The paste thus formed is molded into balls called dough-naught and fried in vegetable oil. It could be eaten direct or with boiled beans mixed with *Gari* and oil.

**Ofam:** Over ripe pulps were blended and mixed with powdered chillies, salt and other spices. The paste was mixed with palm oil and baked in an oven or in an earthen bowl to form a cake. The product is then eaten like cake.

**Fried plantain:** The ripe fruits were peeled and sliced transversely of about two centimeter thickness. The slices were dipped into salty water and fried in vegetable oil.

**Sensory evaluation:** A taste panel of 20 judges participated in the evaluation process. The panelists were selected from all the social classes (senior, middle and low) of Kumasi a typical plantain eating society of Ghana. The sensory attributes for assessment were explained to them as below:

1. Appearance: the physical outlook of the dish
2. Flavour: the smell or aroma of the dish
3. Texture: the firmness, softness or crispiness
4. Taste: how the food is felt on the tongue, whether it was sweet or sour

The data was analysed using descriptive statistics

## RESULTS

The results indicated that the taste of all varieties were highly preferred when fried at stages 3 and 4 of ripening (Table 1). The taste of FHIA 25 and FHIA 03 were not preferred when prepared as *Ampesi* (Table 1). This could be attributed to the banana characteristics in the hybrids resulting in some hybrids becoming very soft at ripening. The difference between the tetraploid hybrids

Table 1: Percentage taste assessment of food preparations from some cooking bananas

Recipes	Saba	KM 5	BITA 3	FHIA 25	FHIA 03	Apantu
Fried ripe plantain	70	70	90	70	80	90
Chips	60	90	80	70	60	100
Kakro	70	80	60	70	70	100
Ampesi	70	40	90	40	10	100
Ofam	80	100	80	80	80	90

Table 2: Percentage overall acceptance of local food preparations by consumers

Recipes	Saba	KM 5	BITA 3	FHIA 25	FHIA 03	Apantu
Fried ripe plantain	60	80	80	80	60	100
Chips	70	92	92	80	80	100
Kakro	90	100	80	90	90	100
Ampesi	0	60	90	60	0	100
Ofam	90	80	90	90	90	100

and the triploid landrace was significant as the landrace was accepted in all cases. All accessions were highly preferred when used as chips (Table 1). The preference level for each variety was more than 60% (Table 2). When processed into *kakro* all accessions were highly preferred (Table 2). BITA 3 was highly preferred for *Ampesi* whereas KM 5 and FHIA 25 were partially preferred as *Ampesi* (Table 2). Saba and FHIA 03 were however totally rejected as *Ampesi* (Table 2) though the taste was preferred (Table 1). This could be attributed to the softness and the whitish colour of the pulp. However when used for *ofam*, all the varieties were highly accepted especially KM 5 (Table 2).

## DISCUSSION

The unacceptability of the cooking bananas when boiled as slices could be attributed to the inherent tetraploid characteristics. In a similar studies at different location in Ghana (Ahiekpor *et al.*, 1996; Hemeng *et al.*, 1996) local plantains were preferred to the hybrids when prepared as boiled slice. The preference was local>IITA hybrid plantains>IITA hybrid cooking banana>Cardaba>FHIA 3. They were rejected for their flavour. However, some of the IITA hybrid plantains were accepted when processed into pounded paste (fufu) (Hemeng *et al.*, 1996). In another evaluation study in Nigeria, (Shavn *et al.*, 1996) the local triploids were preferred to the hybrids when boiled green as slice. The hybrid cooking bananas were also rejected when boiled green as sliced at different locations in Ghana (Shavn *et al.*, 1996). However, the hybrids were accepted when fried as ripe plantain (Dodo) (Shavn *et al.*, 1996). The pulp colour was whitish unlike the orange pulp colour of triploid plantains. The moisture content of the tetraploids was also high. During ripening, water moves from the peel into the pulp thus increasing the moisture

content of the pulp. When the cooking bananas were fried at the ripening stage 5 and above, the product lost its consistency. It could however be used for kakro. Plantain chips are common as street food sold in Ghana. The acceptance of the hybrids for their chips quality could therefore support the trade. The study compared to similar ones revealed that the hybrids could be recommended as location specific depending on the nutritional habits of the people.

To ensure high acceptance, the best form in which to initially introduce cooking bananas to Musa consumers in Ghana should be in processed dishes such as cakes and pancakes. FHIA 25, Yangambi KM 5 and BITA 03 would be accepted by a large proportion of consumers. Except BITA 03, cooking bananas may not be used to prepare Ampesi, a very traditional dish.

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