Studies into the production and qualities of cassava grits (Tapioca) in Nigeria

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INTRODUCTION

Tapioca is made from partly gelatinized cassava starch obtained through the traditional garifying method.

Apart from preliminary reports on its processing by Oyewole and Obieze (1995), there is little or no information on variety, maturity, and processing effects on the quality of such products.

This paper reports the findings on qualities of tapioca products in the major markets compare with laboratory processed samples from four varieties of cassava.

MATERIALS AND METHODS

Tapioca Samples

Tapioca samples, prepared using traditional method (Oyewole and Obieze, 1995), were purchased from Ifo, Lafenwa, Kuto and Ikorodu markets within Ogun and Lagos States of Nigeria. In the laboratory, four varieties of cassava were peeled, washed, grated, sieved and the starch was extracted, dewatered, pressed (41-45%, moisture content), screened, manually roasted (120°C for 20min) and cooled.

Analyses

Proximate composition, functional pasting and colour properties were determined. Acceptability of the cooked tapioca was assessed by 50 consumers. Consumers scored acceptability using a nine point hedonic scale in respect for odour, colour, texture, taste and overall acceptability using a score " 1 and 9" representing dislike extremely and like extremely, respectively (Larmond, 1977).

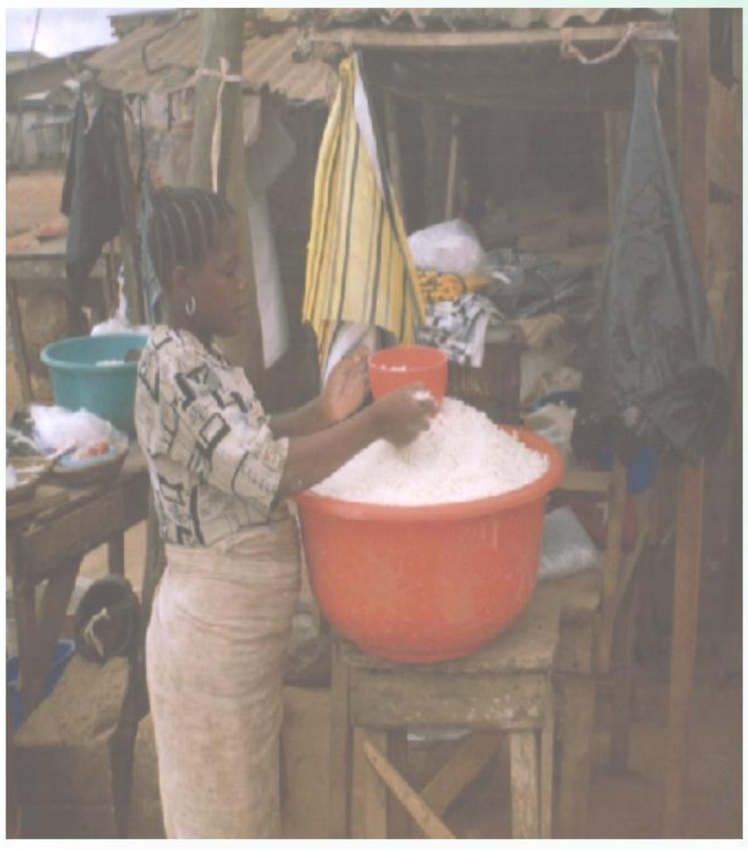

Plate 1. Locally purchased tapioca sample from Ifo Market, Nigeria.

RESULTS

The values for the chemical properties of tapioca samples are presented in Table 1. The moisture content of tapioca grits ranged between 8.1-11.7%, which were within acceptable values for dried products (Sanni *et. al.*, 1998). The acidic contents of tapioca produced from different varieties recorded the lowest value compared to those purchased from the market, indicating the need for standardisation of processing methods.

Table 1. Chemical properties of varietal and commercially available tapioca grits.

Tapioca Samples	Ash %	Crude fibre %	M.C % db	Bulk density	pH	TTA
Variety						
TMS 30572	0.3[a]	0.2[a]	8.4[ab]	0.8[a]	5.2[d]	0.6[d]
TMS 30351	0.2[a]	0.2[a]	9.1[ab]	0.7[a]	5.4[e]	0.7[e]
Idileru	0.2[a]	0.2[a]	9.4[b]	0.8[a]	5.8[g]	0.7[e]
Odongbo	0.2[a]	0.1[a]	9.4[b]	0.8[a]	5.6[f]	0.3[b]
Market samples						
Kuto	0.2[a]	0.2[a]	8.1[a]	0.8[a]	4.6[a]	0.5[d]
Lafenwa	0.2[a]	0.3[a]	11.7[d]	0.8[a]	4.8[b]	0.3[a]
Ifo	0.2[a]	0.2[a]	10.5[c]	0.8[a]	5.1[c]	0.4[b]
Ikorodu	0.3[a]	0.2[a]	9.1[ab]	0.8[a]	4.6[a]	0.5[c]

Each value represent mean of three replicates
Mean values having the same superscript within column are not significantly different ($p>0.05$).

Peak viscosity during heating ranged between 487.4-684.4 RVU with tapioca made from cassava Odongbo recording the highest and tapioca purchased from Lafenwa recording the lowest value (**Table 2**). Odongbo tapioca reached highest peak within shortest time compared to the rest samples.

Table 2 Pasting properties of tapioca grits made from different cassava varieties and those purchased from various markets.

Tapioca Samples	Peak Viscosity RVU	Breakdown value RVU	Final Viscosity, RVU	Set Back value, RVU	Peak time, min	Pasting Temp°C
Variety						
TMS 30572	645.6[ab]	465.3[cd]	230.6[b]	50.3[c]	3.4[ab]	74.9[ab]
TMS 30351	607.9[ab]	423.4[cd]	228.6[b]	44.1[bc]	3.4[ab]	74.6[a]
Idileru	566.4[ab]	355.0[abc]	254.8[bc]	43.4[bc]	3.6[b]	74.6[a]
Odongbo	684.4[b]	487.8[d]	240.8[bc]	44.4[bc]	3.2[a]	74.6[a]
Market						
Kuto	560.8[ab]	400.9[bcd]	180.9[a]	21.1[a]	4.9[d]	74.6[a]
Lafenwa	587.4[a]	238.9[a]	279.4[cd]	30.9[ab]	4.9[d]	74.7[ab]
Ifo	560.0[ab]	287.1[ab]	302.9[d]	30.1[ab]	4.6[c]	74.7[ab]
Ikorodu	553.3[ab]	228.3[b]	30.6[ab]	30.6[ab]	4.9[d]	74.6[ab]

Each value represent mean of three replicate
Mean values having the same superscript within column are not significantly different ($p>0.05$).

Tapioca grits made from Odongbo cassava had the least LGC and WAC while those from TMS 30351 recorded the highest value of LGC, and Tapioca purchased from Kuto market had the highest value.

Tapioca made from Odongbo cassava variety recorded higher values of swelling power while tapioca purchased from Ifo market recorded the least value. The percentage colour indices L* of tapioca samples ranged between 83.3-87.5%.

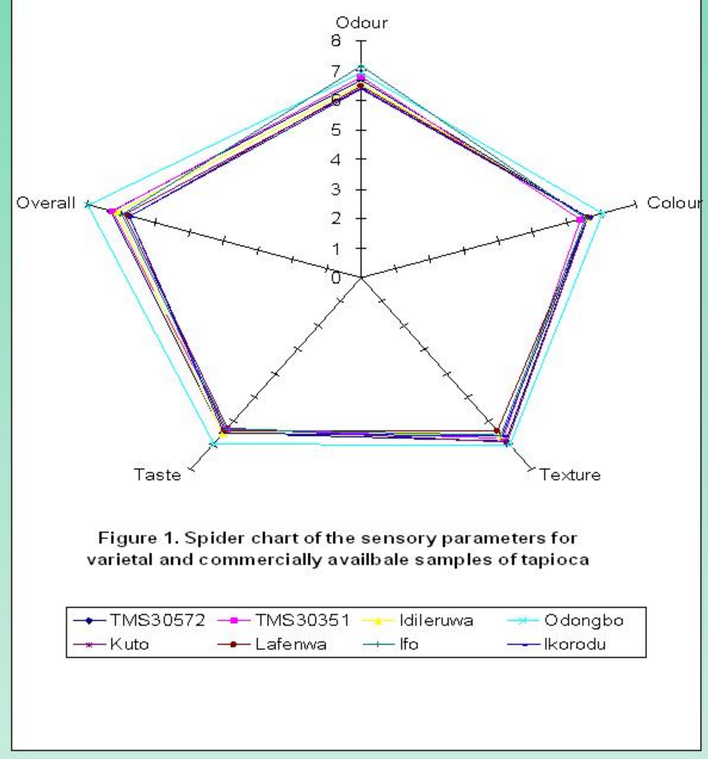

Figure 1. Spider chart of the sensory parameters for varietal and commercially availbale samples of tapioca

Figure 1. Acceptability of cooked tapioca samples.

All of the cooked tapioca samples were acceptable. There is significant difference ($p<0.05$) in acceptability for all the attributes except colour and taste (**Figure 1**). Apart from colour, panelists rated tapioca made from Odongbo cassava as more acceptable than other tapioca samples.

CONCLUSIONS

The variety best suited for the production of tapioca has been identified (Odpmgbo) in this study. Further research however needs to be done on:

- Upgrading the traditional roasting method
- Consumer acceptability
- Rheological properties of tapioca gruel
- Studying the effect of additives in tapioca gruel
- Developing appropriate food safety and quality management (FSQM) systems for the various processing methods to meet the needs of and expectations from cassava SME's and consumers.

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