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Constraints in traditional cassava processing - the case of 'fufu' production -

Les contraintes au cours de la transformation traditionnelle du manioc : le cas de la production de foufou

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- Abstract -

A survey was carried out among 50 cassava processors in ten localities around Abeokuta in Ogun State of Nigeria. All the processors recognized the need to ferment cassava before consumption. Reasons given for fermentation include prevention of spoilage of fresh cassava root, observance of traditional techniques, and the need to have a wide range of cassava products. Major unit operations common to the processors include peeling, size reduction, fermentation and drying. General constraints identified by the processors in the utilisation of cassava include long un-economic period of processing, uncontrolled fermentation process, non-suitability of some cultivars for desired characteristics in cassava products, variations in the quality of the products at different weather conditions and with different batches. Research needs to solve the problems encountered in traditional processing are suggested.

- Résumé -

Une enquête a été réalisée auprès de 50 transformateurs de manioc dans 10 localités autour de Abeokuta dans l'état d'Ogun au Nigéria. Tous les transformateurs ont reconnu la nécessité de faire fermenter le manioc avant de le consommer. Cette nécessité est justifiée par le besoin d'éviter la détérioration des racines, l'attachement aux techniques traditionnelles et le souhait d'obtenir une large gamme de produits dérivés du manioc. Les principales opérations unitaires pratiquées par l'ensemble des transformateurs sont l'épluchage, le découpage, la fermentation et le séchage. Les contraintes identifiées par l'ensemble des transformateurs sont: la durée de la transformation jugée peu rentable; le manque de contrôle du procédé de fermentation; l'inaptitude de certaines variétés à permettre l'obtention de caractéristiques désirées dans certains produits finis; la variabilité de la qualité des produits en fonction des conditions climatiques et des approvisionnements. Les recherches nécessaires pour résoudre les problèmes rencontrés au cours des transformations traditionnelles sont évoquées.

Introduction

Cassava (*Manihot esculenta Crantz*) ranks as one of the important staple food crops in many countries of Africa as well as other parts of the Tropical world. Akoroda *et al.* (1989) reported that cassava was estimated in a survey to occupy 49.7% of the total annually cultivated farmland in some areas of south-west Nigeria. The roots and the leaves of the crop are usually processed for human consumption Processing methods vary form place to place and the processing method determines the product. A large number of unit operations have been identified to be involved in the village processing of cassava and these include peeling, size reduction, fermentation, drying , roasting (garification), boiling and cooking (Lancaster *et al.*, 1982).

Village processing of cassava had been noted to involve some tedious, time consuming constraints (Igbeka *et al.*, 1992). In order to sidetrack these constraints, some processors have developed 'short-cuts' through insufficient processing of cassava. Some of these 'short-cuts' have been identified to have risks, especially dietary cyanide exposures to consumers of improperly processed cassava products (Mlingi *et al.*, 1992; Banea *et al.*, 1992).

This article reports on findings of some constraints reported by some village cassava processors in Nigeria. It is hoped that this would help to generate appropriate attention to research needs in solving the problems.

Study Area and Methods

The ten localities chosen for this survey are located in Abeokuta in Ogun State of South-West Nigeria. Cassava is the main staple root crop of the population; where a large proportion of the people consume one form of cassava product every day. Five processors from each locality were studied during the survey. Qualitative anthropological approach for determining behaviours that are not necessarily revealed by questions (Banea *et al.*, 1992) and the Rapid Rural Appraisal (Scrimshaw and Hurtado, 1987) methods were used for the study. Individual as well as group interviews were conducted.

Results

All the fifty processors confirmed that they process their cassava roots to three different products - *gari, fufu,* and *lafun.* The general order of production are *gari* > *lafun* > *fufu*'. The processing operations for the production of these products are the same among all the processors in the localities and these are

illustrated in Figure 1. All the processors believe that cassava should be fermented before consumption. The reasons given for fermentation-processing include: "that is how our fore-parents taught us" (74%); "it helps to prevent spoilage" (60%); "it is necessary in order to have food varieties from cassava " (80%); "it helps to destroy 'poison' or 'dangerous materials' " (44%).

Processors identified 'gari' as the easiest to produce cassava product followed by 'lafun'. 'fufu' production was identified to be most difficult. Constrains which processors identified as making cassava processing into 'fufu' to be difficult are presented in Table 1.

All the processors reported that the quality of cassava products vary from one processor to the other, and from one season to the other and even from different batches in the same season by the same processor.

None of the processors agreed that they had ever followed a 'short-cut' procedure different from the traditional method but all confirmed that some other

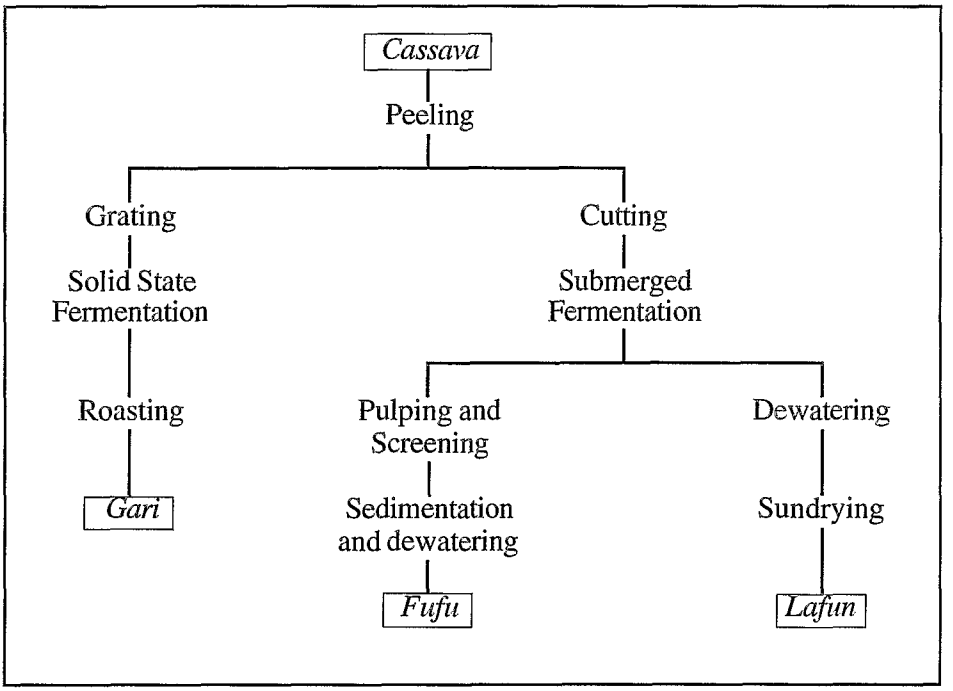

Figure 1
Village processing of cassava into gari, fufu and lafun in South-West Nigeria

Table 1
Constraints in the traditional processing of cassava to 'fufu'

Identified constraints	% of affirmative processors
Peeling is time-consuming	90
Peeling is tedious	64
Fermentation is too long	93
Fermenting cassava odour not liked by neighbours (Processing space)	56
Odour of soak-water disdainful	34
Some cassava roots do not ferment readily	90
Newly introduced cultivars are not good for 'fufu'	54

processors adopt some 'short-cut' for quick financial gain. The major 'short-cuts' identified by processors are that some other people ferment their cassava for less that one day as against the normal 3 to 5 days which is traditional in the area and some processors harvest and process immatured cassava roots.

All the processors believed that the length of fermentation is an important determinant of the quality of their cassava products and that the season of processing as well as the variety of the cassava root determine the length of fermentation. Processors confirmed that shorter fermentation periods (2-3 days) are required during the dry (hot) season while longer fermentation periods (3-5 days) are required during the rainy (cold) season for proper retting of cassava for 'fufu' production. Some processors expose fermenting roots to direct sunlight as a means of enhancing the fermentation process.

None of the village cassava processors has participated in any cassava processing extension programme and none of them knew about microorganisms or 'starter culture'. A large percentage of the processors (93%) wanted processing time to be shortened.

Discussion

Gari, *fufu* and *lafun* are the most common cassava products in Nigeria. Olayide *et al.* (1972) noted that 70% of the cassava grown in Nigeria in the early 1970's was channelled into *gari* manufacture. This survey confirms that most processors still prefer to process a large proportion of their cassava roots into *gari*

than any other product. A possible reason for the processors' preference for *gari* may be the reduced constraints in *gari* processing. There are less constraints in *gari* production because more that any other cassava product, the processing has been highly mechanized (Idowu, 1990).

All the processors recognized the need for the fermentation of cassava. Nambisan and Sundaresan (1985) reported that processing of cassava is important to improve palatability, to reduce toxicity and as a means of preservation. Some of the processing factors which the processors identified as affecting the fermentation process and the quality of the fermented products had been confirmed by Oyewole and Odunfa (1992).

From the opinions expressed by the processors, the following major constraints and research needs could be identified:

1) The manual peeling of cassava root using knives is tedious and time-consuming. There is an urgent need to develop better methods and or machinery for cassava peeling. Plant breeders could also aim for cassava roots with low peel densities.

2) The fermentation period is too long for profitable economic returns. There is still need for research to confirm the role of fermentation in cassava processing. An earlier assertion that in *gari* processing, the fermentation process may have little or no role to play in the detoxification process (Vasconcelos *et al.*, 1990) have not taken into cognizance some other possible roles of fermentation in the product quality.

3) Fermentation is left to 'chance' inoculation from the environment and no control is being carried. This constraint could be challenged by the development of appropriate starter cultures for each of the various cassava products.

4) Not all cultivars of cassava are suitable for processing into any of the cassava products. The non-suitability of newly developed cassava cultivars for some cassava products has been identified (Akoroda *et al.*, 1989). There is need for studies to investigate appropriate products for new cassava cultivars being promoted in different countries.

5) The characteristic odour of fermenting cassava is disdainful to some people. There is need to further investigate appropriate treatments for cassava processing waste water and develop means of controlling or reducing the characteristic odour of fermenting cassava soak-water (Ohochukwu, 1985).

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