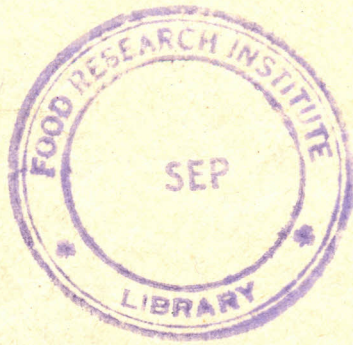


QUALITY PARAMETERS OF TRADITIONAL
CASSAVA FOOD PRODUCTS

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This paper was prepared in response to an invitation to present a paper at a Workshop on "Cassava Research In Ghana". The workshop was organised by the Department of Agricultural Economics of the University of Ghana, and the Crop Research Institute, Ghana, and was scheduled to take place from March 20 - 21 1989 at the Dept. of Agric. Econs. but was later postponed indefinitely.

INTRODUCTION:

The importance of quality control in food manufacture cannot be underestimated.

An effective quality control program ensures that:

- i) a food product conforms to a given standard which consistently meets the requirements and expectations of consumers.
- ii) a food product reaches the consumer in a wholesome state and without any health hazard.
- iii) process parameters for the particular product are standardised and carefully monitored and controlled, in order to turn out products with the desired quality.
- iv) basic information on process capability and facilities is available to guide managerial decisions on expenditures necessary to maintain a desired quality level or any necessary quality improvement efforts (7).

It implies therefore that the success and viability of any industry depends on efficient quality control programmes.

However any meaningful quality control measure must begin with the consumers requirements and specifications. Those quality aspects that are generally acceptable to consumers must be determined. The measurable chemical and physical properties responsible for such desired quality must then be identified and the two suitably related to establish the required magnitudes. These then constitute the quality parameters or quality specifications for the particular product.

But for these quality specifications to be meaningful, realistic and practical, they must be set against the cost the producer would incur in turning out products of such quality, and appropriate modifications made such that a standard of excellence is chosen which represents a minimum cost to the producer but at the same time is satisfactory to the consumer in general.

Upon this foundation then:

- i) suitable quality control measures can be instituted and
- ii) standard process parameters can be established.

Most industrially manufactured food products have international or national established standard quality parameters, backed by effective food laws.

Unfortunately this is not the case with cassava products. Traditional cassava based food products in most cassava producing countries have not generally been standardised and their quality is very variable (8). Besides not much information on the physico-chemical properties that affect the quality of these is available (2). But then in international markets legislation for quality control in a wide range of products including cassava products for export is becoming more widespread. And because of the prominent position cassava has gained in international circles in recent years, there is a growing awareness of the importance of quality in processed cassava products and of the need for national standardisation of such products.

At a recent seminar held in Nigeria on Cassava Products this need was re-echoed and emphasised (6).

Some attempts have however been made by workers in various countries to establish quality specifications for some cassava products peculiar to their individual localities (1,3,10). But it would be difficult to adopt these standards without any modifications even for products of similar nature in this country because consumer preferences differ from country to country and sometimes even within each country.

These facts thus underscore the need for intensive research work to be carried out in establishing quality specifications for our indigenous, Ghanaian traditional cassava products.

In this paper, currently available information on existing standards—both official and otherwise—for traditional cassava products and the related quality parameters would be discussed; and for those products with no existing standards the quality parameters that must be emphasized in establishing standards for these products would be discussed.

TRADITIONAL CASSAVA PRODUCTS AND THEIR QUALITY SPECIFICATIONS

The various traditional cassava-based food products peculiar to Ghana are: Gari, Kokonte, Cassava dough, Tapioca, Starch, Fufu, Yakayake, Agbelikaklo, Agbelikpornor (Cassava Biscuit) Atieke and Starch Biscuits.

Official Quality Standards have been established for only three of these products namely Starch, Tapioca and Gari, obviously because these products are not peculiar to Ghana alone. The institutions responsible for the establishment of some of these standards are given in the appendix.

STARCH

Usually cassava starch purchased by Industries is processed further to suit their specific needs, and they therefore have their own specifications to meet the requirements for special end-uses. In all cases however buyers are interested chiefly in its colour, uniformity, moisture content cleanliness and pH factor. Additional parameters of interest may be ash content, viscosity and sensitivity to acids, The most desirable qualities therefore are a clean white product free from specks, dirt, insect infestation and mould, with a moisture content usually of about 12% (8).

Typical specifications for starch meant for food uses in certain countries are as follows:

SPECIFICATION FOR CASSAVA STARCH

	INDIA	BRAZIL	MALAYSIA	U.S	U.K
Starch % min (dry basis)	98.0	80.0	-	-	-
Moisture % max "	12.5	14.0	12.5	14.0	8-12
Ash % max "	0.5	1.0	0.4	0.3	-
Fibre % max "	0.3	-	0.2	-	-
pH	4.5-7.0	-	3.8	5.0-7.0	

TAPIOCA

The main considerations for standardisation are usually moisture content, ash and general appearance (and particle size in the case of granulated tapioca). In general tapioca pearls, seeds or flakes should be well gelatinised and possess a white to creamy-white colour. It should be free flowing and free from dirt grit, foreign matter or any off-flavours or odours. (8)

SPECIFICATIONS FOR TAPIOCA PEARLS & FLAKES

	PEARLS	FLAKES
Moisture % max	12.5 - 15.0	15.0
Total Ash % max	0.2 - 0.5	0.2 - 0.5

GARI

The parameters of major concern are colour, acidity, moisture content, cyanide content, ash, crude fibre, swelling capacity, general appearance and particle size (8).

Good quality gari should be dry creamy yellow without any peculiar odours and of a slightly sour and sharp taste. For safe storage gari should be dried to a moisture content of below 12% preferably 8-10% (1-3). The grains or particles should be uniform in size and the material should not contain stones, dirt, sand, insects or parts of insects. It should be of low fibre content and swell to about three times its volume when placed in water.

STANDARDS FOR GARI

	CODEX ALIMENTARIUS	GHANA
Moisture Content % max	12	8-10%
Crude Fibre % max	2	2.5%
Ash Content % max	2.75	1.5%
Acidity % max	0.6-1% as lactic acid	0.8-1.2
HCN	2mg/kg as free HCN	20ppm

The Codex Standard does not give any specifications for colour taste and odour. These are left for individual producing countries to decide on the basis of what is acceptable in a particular locality. The Codex Commission however prohibits the addition of any food additives to gari (4).

Five classifications of gari are identified under the codex standard. These are extra fine, medium, coarse and unclassified gari.

OTHER CASSAVA PRODUCTS

For the rest of the other cassava products listed above, one condition must be satisfied before any meaningful quality standards can be specified and adhered to ie. the products must be processed into storable forms.

Apart from Kokonte which is already in a dry storable form all the other products are not storable. The development of the Instant Fufu Powder and The Dehydrated Fermented Cassava Meal (9, 5) at the Food Research Institute now makes it possible to obtain Fufu and Cassava Dough in a dry storable form which can be reconstituted and used as required. Investigations are underway to develop similar intermediate products for Yakayake and Agbelikaklo. With the development of such intermediate products then, it would be best to establish quality specifications for these based on the taste preferences of consumers for the intended end products, and the safety of consumers.

CASSAVA DOUGH

Following the development of the dehydrated product, work has been initiated on establishing quality standards for the product. Current work involves screening of market samples of the product for acidity level ester and aldehyde contents. This is expected to help establish the quality (with respect to taste and aroma) of what is already on the market and seems acceptable to consumers. The results so far available indicate a range of 1.01-2.36% as total acidity of 20 screened market samples.

The other quality factors that would need to be considered during the investigations include cyanide levels, texture of the product, starch content, crude fibre, ash, and microbial load.

FUFU

Considerations for standardisation of fufu should include, taste, texture, consistency cyanide content, colour and crude fibre which should be at a minimum, because of the desired smooth consistency expected of fufu.

Fufu is expected to have a bland taste, a very smooth texture and a high particle consistency. Since the product is not fermented, quality specifications should include a specification of the variety and quality of raw material from which it should be produced in order to ensure a low cyanide content of the end product.

YAKAYAKE

Quality parameters for yakayake would be the same as for cassava dough, the only difference being in the texture or particle size of the grains of the product. Yakayake should have a rough texture.

AGBELIKAKLO

Specifications for Agbelikakle should include the acidity which should be at a minimum, volatile oil content, texture and like fufu a specification of the variety of cassava to be used to ensure a low cyanide level in the final product.

ATSEKE

Specifications for Atseke would be the same as for Yakayake except that. Atseke should have a higher starch content than Yakayake but must have a lower acidity level than Yakayake since the cassava is neither dewatered nor fermented during the preparation of Atseke. Again the quality of cassava to be used must be specified.

ORELIKPORNO

The main quality factors that should engage attention are:

- i) cyanide level since the product is unfermented
- ii) acidity which should be at a minimum
- iii) texture
- iv) starch content and
- v) ash

KOKONTE

Considerations for standardisation should include starch content, cyanide level, ash content, hot paste consistency and texture.

CONCLUSION

In conclusion it must be emphasized that the quality of processed cassava products depends on the qualities of the raw material used and on the processing methods. Tuber quality also changes with maturity and for each variety maturity differs.

Thus any attempt to establish quality standards for cassava products must take into consideration the quality of the raw material from which the product is made.

APPENDIX

LIST OF SOME INSTITUTIONS RESPONSIBLE FOR STANDARDS QUOTED IN TEXT

INSTITUTION	PRODUCTS
1. Brasil Conselho Nacional, Brazil.	Starch, Tapioca
2. Standards Institution of Malaysia, Malaysia.	Starch, Pearl Tapioca
3. Tapioca Institute of America, U.S.A	Starch, Tapioca
4. Ghana Standards Board Ghana	Gari
5. Codex Alimentarius	Gari

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