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|  | | **Code of Practice for Processing Cassava Products** | |
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**Foreword**

The Economic Community of West African States (ECOWAS) was established on 28th May 1975 by Heads of States and Governments of fifteen (15) Member States as an Economic Community of the Region. The Treaty was reaffirmed in 1993.

One of the important mandates of ECOWAS is to promote the establishment of Common Market, the development and harmonization of Standards and Conformity Assessment procedures and Measures in order to reduce Technical Barriers to Trade, encourage intra and international Trade as well as enhance the industrialization of the region.

ECOWAS Standards are drafted in accordance with the rules given in the ECOWAS Standards Harmonisation Procedures (ECOSHAM NO. ECOSHP-01) and ISO/IEC Directives, Part 1.

The work of preparing ECOWAS Standards is normally carried out through ECOWAS Technical Harmonisation Committees. Each member body interested in a subject for which a Technical Committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ECOWAS, also take part in the work.

The main task of the Technical Committees is to prepare ECOWAS Standards. Draft ECOWAS harmonized Standards adopted by the technical Committees are circulated to the member states for voting. Publication as an ECOWAS Standard requires approval by at least 75% of the member states casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ECOWAS shall not be held responsible for identifying any or all such patent rights.

The work of preparing this standard was carried out by the ECOWAS Technical Harmonization Committee 1(THC1) *Agricultural Products*

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**Introduction**

Cassava (*Manihot esculenta Crantz*) root and its allied products have a wide application in the food and feed industries and have great potential to contribute positively to ECOWAS. However, due to poor practices in the production, processing and handling of these important commodities, there are concerns on the quality of the cassava and cassava products. The poor handling practices during cultivation, harvesting, processing and storage have negative effect on the product quality.

This code of practice was therefore elaborated by the ECOWAS Technical Harmonization Committee 1(THC1) *Agricultural Products* to ensure quality control, consumer safety and fair trade practices in the production and sales of cassava products.

It is intended to provide guidelines to be followed in cultivating, harvesting, processing, packaging, storage and transportation of cassava roots and cassava products.

1. **SCOPE**

This ECOWAS Code of Practice provides guidance for all interested parties involved in the cultivation, processing and handling of cassava (*Manihot esculanta Crantz)* roots and cassava products intended for human consumption and industrial usage. .It recommends practices that are to be observed in order to obtain quality cassava roots and cassava products:

**2 NORMATIVE REFERENCE**

The following referenced document is indispensable for the application of this ECOWAS Code of Practce. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies

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1. *CODEX STAN 151 -1995 CODEX Standard for Gari*
2. **TERMINOLOGY**

For the purpose of this Code of Practice, the following shall apply:

* 1. **Fresh cassava Roots**

the unpeeled roots from varieties of cassava [*Manihot esculenta* (Crantz)] of the *Euphorbiace* family which contain stored carbohydrates mainly as starch**.**

**3.2 Sweet Cassava Root**

the cassava root that contain less than 50 mg/kg hydrogen cyanide (fresh weight basis).

**3.3 Cassava Products**

products which have been processed from cassava roots for domestic or industrial use.

**3.4 Clean**

free from adhering soil, dust, chemical deposits, pests, food residue or other visible foreign matter, except substances used to prolong its shelf life.

**3.5 Fresh**

raw and wholesome.

**3.6 Fully matured**

the tubers have reached full development and are firm with a tough skin and with no surface shriveling

**3.7** **Practically free**

product will be without defects, blemishes or damage in numbers or quantities in excess of those that can be expected to result from, and be consistent with good cultural and handling practices employed in the production and marketing of the commodity.

**3.8** **Crude Fiber**

residue remaining after digesting cassava product with acid and alkaline, which can be burnt.

**3.9 Moisture content**

amount of water required in a Cassava tuber.

**3.10 Sound**

free from disease or serious deterioration (such as decay, breakdown, freezing damage, or soft or shrivelled specimens) that appreciably affects their appearance, edibility, the keeping quality of the produce or market value.

**3.11 Wholesome**

not affected by rot, mould or deterioration as to make it unfit for consumption.

**3.12 Portable Water**

fresh water fit for human consumption .

**3.13 Foreign Materials**:

materials that are not the composition in nature of Cassava roots.

**3.14 Ash**:

residue obtained after igniting Cassava product to constant weight.

**3.15 Contamination**

the occurrence of any objectionable matter in the products

**3.16 Toasting**

a process of removing water/ moisture from gari by spreading the sifted cake on heat, depending on the heat source and quantity of sifted cake.

**3.17 Gari**

the finished product obtained by artisanal or industrial processing of cassava tubers (Manihot esculenta Crantz). The processing consists of peeling, washing and grating of the tubers, followed by fermentation, pressing, fragmentation, granulation, drying if necessary, sifting and suitable heat treatment.

**3.18 Edible cassava (Manihot esculenta Crantz) flour**

the product prepared from dried cassava chips or paste by a pounding, grinding or milling process, followed by sifting to separate the fibre from the flour. In case of edible cassava flour prepared from bitter cassava (Manihot utilissima Pohl), detoxification is carried out by soaking the tubers in water for a few days, before they undergo drying in the form of whole, pounded tuber (paste) or in small pieces.

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**4.0 TYPES AND PROCESSING OF CASSAVA PRODUCTS**

For the purpose of this code, the following types of cassava and cassava products are considered:

* Fresh Sweet Cassava roots
* Cassava Chips
* Garri
* High Quality Cassava Flour
* Edible Cassava Flour
* Ethanol

**4.1 Fresh sweet Cassava root**

**4.1.1 Primary production, handling and Storage of Fresh sweet Cassava root**

**4.1.1.1 General Requirement**

Fresh cassava is grown and harvested under a wide range of climatic and diverse geographical conditions, various agricultural inputs and technologies shall be used.

In each primary production area, it is necessary to consider the particular agricultural practices that promote the production of safe fresh cassava, taking into account the conditions specific to the primary production area, varieties of cassava and methods used.

During production, primary and secondary deterioration should be avoided so as to maintain the quality of fresh cassava. Procedures associated with primary production should be conducted under good hygienic conditions and should minimize potential hazards to health.

**4.1.2** **Agricultural input requirements**

a). Inputs used for the production of fresh cassava shall conform to the relevant Codex Alimentarius standards.

b). Agricultural inputs shall not contain microbial or chemical contaminants at levels that may adversely affect the safety and quality of fresh cassava.

c). Agricultural workers who apply agricultural chemicals shall be trained in proper application procedures.

d). Growers shall keep records of agricultural chemical applications. Records should include information on the date of application, the chemical used, the crop sprayed, the pest or disease against which it was used, the concentration, method and frequency of application, and records on harvesting to verify that the time between applications and harvesting is appropriate.

e). Agricultural implements and equipment shall be calibrated, as necessary, to control the accuracy of application.

f). Agricultural chemicals should be kept in their original containers, labelled with the name of the chemical and the instructions for application and use

**4.1.3 Handling during production**

During the primary production and post-harvest activities, effective measures shall be taken to prevent contamination of fresh cassava from agricultural inputs or personnel who come directly or indirectly into contact with fresh cassava.

To prevent contamination, fresh cassava growers, harvesters and handlers shall adhere to the following:

a) Fresh cassava unfit for human consumption should be segregated during harvesting. That which cannot be made safe by further processing should be disposed of properly;

b) Agricultural workers should not use harvesting containers for other purposes (e.g. lunches, tools, fuel, etc.). Where such containers have to be used for other purposes they shall be cleaned and sanitized;

c) Care shall be taken when packing fresh cassava in the field to avoid exposure to contamination with animal/human filth.

**4.1.4** **Handling during harvesting**

Cassava roots can be harvested at any time of the year. The food quality of the roots, particularly the starch content, increases with time up to an optimal period after planting. However, excessive harvesting of the leaves can have a negative effect on the yield of roots.

Careful harvesting and proper handling of roots is an important step towards successful storage.

Harvesting cassava roots may either be done by hand where the soils are soft or by digging or mechanical harvesting around the roots in hard soils so as to free the roots from the plant.

The plant should be lifted using the lower part of stem and pulling the roots out of the ground, then removing them from the base of the plant by hand. Levers and ropes can be used to assist harvesting.

To facilitate lifting, the plant should be cut down about 30 cm - 50 cm above the ground. The protruding stem shall be used to lift the roots out of the ground and care should be taken not to break the roots. This leads to losses if broken roots are not retrieved from the soil and to contamination that may evolve into root spoilage.

Care should be taken during the harvesting process to minimize damage such as bruising, scrapping or breaking of the roots, as this greatly reduces shelf life. Roots should not be thrown or dropped down as this may accelerate deterioration.

Avoid injuring the roots at harvest by the digging tools, which may be wooden sticks, machetes, hoes or forks.

**4.1.5 Handling during storage**

Cassava roots shall be harvested and handled with extreme care if they are to be kept for more than a week.

There are a number of different practices which, if used in combination, will assist in delaying deterioration:

a) Cutting off the stems, leaving only a short part above ground. This operation should be done about three weeks prior to harvesting;

b) As cassava roots usually start rotting from the neck, (i.e. the point of attachment of the root to the parent plant), harvesting the roots with part of the stem (2 cm - 5 cm) still attached may prevent a rapid spread of decay into the root;

c) Minimize damage at lifting by harvesting while the soil is wet, for example after a rain;

d) Retain only those roots that do not show signs of injury. Roots that are to be kept for more that one week or more should be carefully selected since curing will not be effective on roots with extensive damage; and

e) Establish curing of the roots after harvest as a routine operation with, as far as possible, the minimum of handling.

Severely damaged roots should not be stored because of the following reasons:

a) Lower quality;

b) Increased risk of subsequent pathogenic losses; and

c) Risk of introducing disease organisms into sound produce.

**4.2 Cassava Chips**

**4.2.1 Processing and Storage of Cassava Chips**

**Cassava Root**

**Sorting**

**Peeling & Washing**

**Chipping**

**Drying**

**Cooling**

**Packaging**

*Fig. 1 Process Flow Chart for Cassava chips*

**4.2.1.1 Cassava Root**

A fresh cassava root that is matured should be used. The fresh roots shall be free from insect damage.

**4.2.1.2 Sorting:**

The harvested cassava root are sorted, the wholesome roots as well as to remove immature root and foreign materials.

**4.2.1.3 Peeling & Washing:**

The root are manually peeledwith clean stainless steel knives or mechanical peeler and washed in portable water in order to remove sand and other dirt. Clean cloth and used sack can also be used to facilitate washing

**4.2.1.4 Chipping:**

The washed peeled cassava roots are fed into cassava chipping machine to obtain chips of regular sizes and shapes. Also it can be manually cut into chips of uniform sizes.

**4.2.1.5 Drying:**

The wet chips are spread in stainless steel trays in a drier at a regulated temperature in order to remove the moisture. Also wet cassava chip are spread on elevated platform covered with a black polythene sheet directly to the sun. The black polythene facilitates drying by absorption of solar heat and the elevated platform prevents dust and other dirt from contaminating the drying product.

**4.2.1.6 Cooling:**

The dried chips are allowed to cool naturally to room temperature prior to packing**.**

**4.2.1.7 Packaging and Labelling:**

The packaging and labelling shall in such manner which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product. Packaging shall be sound, clean, dry, and free from insect infestation or fungal contamination.

**4.3 Gari**

**4.3.1 Processing and Storage of Gari**

**CASSAVA ROOTS**

**↓**

**Peeling**

↓

**Washing**

**↓**

**Grating**

**↓**

**Fermenting**

**↓**

**Pressing**

↓

**Cake breaking &Sifting**

**↓**

**Gari Toasting/Roasting**

**↓**

***GARI***

**↓**

**Cooling**

**↓**

**Sieving/Sifting**

**↓**

**Packaging**

**↓**

**Storing**

*Fig. 2 Process Flow Chart for Gari from Cassava roots*

**4.3.1.2 Cassava Roots**

Use fresh cassava roots harvested 10-12 months after planting. The fresh roots shall be free from microbial or insect damage and without serious bruising or cuts

***Note****: using mixed varieties of cassava roots in processing should be discouraged. It is advisable to stick to a particular variety for a particular product*

**4.3.1.3 Sorting:**

Select fresh, matured cassava roots without rot from the lot for processing. Discard the unwholesome roots.

**4.3.1.4 Peeling:**

Peel with clean stainless steel knives and remove woody tips. Ensure that the rind is completely removed and avoid excessive waste of roots Mechanical peelers are available in medium to large scale processing.

**4.3.1.5 Washing:**

Wash peeled roots in clean water at least twice to remove pieces of peel, sand and other dirts. Clean cloth and used sack can also be used to facilitate washing.

**4.3.1.6 Grating:**

Grate cassava roots properly in clean stainless steel grater or motorize cassava grater. A uniformly smooth mash without lumps should be obtained. In case of non-uniform mash, grate again until smooth mash is obtained. The smoothness of the mash determines the quality, yield and market value of the finished *Garri*.

**4.3.1.7 Fermenting:**

Put cassava mash into a clean sack and tie. Allow to stand in a fermenting trough for 2-4 days. Arrange sacks in such a way that there is no contact with sand or dirts that can contaminate the mash. Allow free sipping of water from the sacks.

Fermentation should be properly controlled, should not be less than 2 days as too short a period will result in incomplete detoxification and a bland productalso prolonged fermentation, beyond 3 days, should be discouraged to ensure adequate starch content in product.

*The practice of processing cassava roots which is just been stored overnight into Garri without fermentation the mash should be discouraged.*

**4.3.1.8 Pressing**:

The fermented mash in sacks is pressed to remove as much moisture as possible. Pressing is completed when water is no longer dripping from the sacks. If dewatering is not complete, there would be lumps during toasting which reduces quality and yield of Garri. The pressing time depends on the efficiency of the press and moisture content of the mash. Sacks should not be used for too long to prevent bursting during pressing. In some cases of light sacks or over-use of sacks, it is advisable to double the sacks.

The press and the pressing area should be kept very clean with good drainage system for safe disposal of the effluent to avoid environmental pollution and public health hazards.

**4.3.1.9 Cake breaking/Sifting or Sieving**:

Cake breaking is done using clean hands followed by sifting with non-rusting sifter into clean basin to separate fibrous materials to control size of article. Sifter made of stainless steel material is preferable.

**4.3.1.10Toasting/Roasting/frying:**

Toast and stir constantly in a large, shallow cast-iron pan over fire, with a piece of gourd or a wooden paddle until the Garri dried through hand feel. This may take 20-30mins depending on the heat source and quantity of sifted cake. The finished product (Gari*)* is usually recognized from the color change from white to cream (for non-palm oil fortified Garri) and crispy hand feel of the grains/particles. Toasting can also be done mechanically using an automated rotary dryer or other improved Garri fryer made of stainless steel material and with firewood or charcoal as the heat source.

The toasted Garri should be collected into a clean basin and spread on a raised platform lined with clean polythene material or white cloth to cool to room temperature.

**4.3.11 Sieving:**

Sieve to obtain granules of uniform size.

**4.3.12 Packaging and labeling:**

The packaging and labelling shall in such manner which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product. Packaging shall be sound, clean, dry, and free from insect infestation or fungal contamination.

**4.4** **High Quality Cassava Flour**

**4.4.1 Processing and Storage of High Quality Cassava Flour**

**Harvesting of Cassava Roots**

**↓**

**Sorting**

**↓**

**Peeling &Washing**

**↓**

**Grating**

**↓**

**Pressing**

**↓**

**Cake breaking &Sifting**

**↓**

**Drying in a thin layer**

**↓**

**Milling finely &Sifting**

**↓**

**High Quality Cassava Flour**

**↓**

**Cooling**

**↓**

**Packaging**

**↓**

**Storing**

*Fig 3:* Flow Chart for production of High Quality Cassava Flour from Cassava roots

**4.4.1.2 Cassava roots**:

Fresh cassava roots must be healthy without rot and well-handled from farm. The roots shall be processed within 12 hours after harvesting.

The use of mixed varieties of cassava root in processing should be discouraged.

It is advisable to stick to a particular variety for a particular product

**4.4.1.3 Sorting:**

Select fresh, mature cassava roots without rot from the lot for processing. Discard unwholesome roots.

**4.4.1.4 Peeling & Washing:**

Peel with clean stainless steel knives and remove woody tips. Ensure that the rind is completely removed to ensure low fiber and white color of the finished product. Mechanical peelers are available in medium to large scale processing. The peeled cassava root should be washed thoroughly in clean water to remove pieces of peel sand and other dirts.

**4.4.1.5** **Grating:**

The washed cassava roots shall be grate properly in clean stainless steel grater to obtain uniformly smooth mash without lumps. Mechanical grater in medium to large scale processing .The smoothness of the mash determines the quality, yield and market value of the finished High Quality Cassava Flour.

**4.4.1.6 Pressing:**

The mash is loaded into sacks and pressed to remove as much water as possible. Screw or hydraulic jerk can be used. Complete dewatering facilitates drying. Pressing should be done immediately after grating to avoid the onset of fermentation. Sacks should not be used for too long to prevent bursting during pressing. In some cases of light sacks or over-use of sacks, it is advisable to double the sacks.

The press and the pressing area should be kept very clean with good drainage system for safe disposal of the effluent to avoid environmental pollution and public health hazards

**4.4.1.7 Cake breaking/Sifting or Sieving:**

Cake breaking is done using clean hands followed by sifting with non-rusting sifter into a stainless steel clean basin. It can also be done by placing the pressed cake back into the grater and disintegrate for drying. Sifter made of stainless steel material is preferable.

**4.4.1.8 Drying:**

The sifted cake is dried in a dryer to reduce moisture level. Sun drying, use of rotary,flash or solar dryer can be employed to reduce the moisture.

**4.4.1.9 Milling:**

Milling is done to obtain fine textured flour using hammer mill or disc attrition mill.

**4.4.1.10 Packaging and labelling**

The packaging and labelling shall in such manner which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product. Packaging shall be sound, clean, dry, and free from insect infestation or fungal contamination.

**4.5** **Ethanol**

**4.5.1 Processing and storage of Ethanol**

**Cassava Root**

**Sorting**

**Peeling & Washing**

**Grinding/Grating**

**Saccharification**

**Fermentation**

**Distillation**

**Packaging/Storage**

Fig 4 Process flow chart for cassava based ethanol

**4.5.1.2 Sorting:**

The cassava root shall be sorted and select fresh mature ones without rot.

**4.5.1.3 Peeling & Washing**

The root should be peel with clean stainless steel knives and remove woody tips. Mechanical peelers can also be used. The peeled cassava root should be washed thoroughly in clean water to remove pieces of peel sand and other dirts.

**4.5.1.4** **Grinding/Grating:**

Grate roots properly in clean stainless steel grater or mechanical grater to obtain uniformly smooth mash. Then cook in a jet cooker.

**4.5.1.5 Fermentation:**

Allow the mash to stay for a period of 5-7 days to allow fermentation to take place. put in stainless steel basin with cover or fermentor in medium or lager scale.

**4.5.1.6 Distillation**

Fermented ethanol and water mixture are put in the still. Pot still or vacuum still should be used. Heat should be applied by either electricity or coal. The distilled ethanol should be collected n a clean container.

**4.5.1.7 Packaging and Storage:**

The packaging and labelling shall in such manner which will safeguard the hygienic, nutritional, technological, and organoleptic qualities of the product. Packaging shall be sound, clean, dry, and free from insect infestation or fungal contamination.

**5.0** **BUILDING AND PROCESSING FACILITIES**

**5.1** The factory should be located in an area that is free from environmental pollution and any industrial activities that can pose a serious threat to contaminating food.

**5.2** The factory should be situated in an area which is not subject to flooding unless sufficient safeguards are provided.

**5.3** The factory should be cleared ground from waste, either liquid or solid, can be removed effectively and away from sources of insects and rodents.

**5.4** There should be good supply of potable water and, if required, electricity.

**5.5** The factory should have good road for bringing in raw materials and packaging, and sending out products.

**5.6** The factory layout should permit an orderly flow of material through the plant during processing.

**5.7** The factory should be designed to prevent cross-contamination between raw materials and finished products.

**5.2 Building, structure and condition of plant**

**5.1** The building to house cassava products should be constructed from concrete or bricks with adequate protection against insects and rodents.

**5.2** The building should contain a processing hall, a changing room, ware- housing, and a free lobby, toilet.

**5.3** Fixed surfaces of the infrastructure, such as washing troughs and steeping tanks, which come into contact with the processing materials, should have easy-to-clean internal surfaces and be inert to cassava products.

**5.1.4** The surface of walls, partitions, and floors should be made of impervious materials with no toxic effect in intended use and have a smooth surface up to a height appropriate to the operation.

**5.1.5** The floor should be constructed with concrete or terrazzo (if affordable), have adequate surface drainage and be easy to sweep and wash.

**5.1.6** Ceilings and overhead fixtures should be constructed and finished to minimize the buildup of dirt and condensation, and the shredding of particles

**5.1.7** The windows should be easy to clean, and fitted with removable and cleanable insect-proof screens.

* + 1. The doors should be smooth, non-absorbent, and easy to clean and disinfect.

**5.1.9** There should be adequate means of natural or mechanical ventilation to minimize airborne contamination, control ambient temperature, odors, and humidity.

**5.1.10** The lighting fixtures shall be appropriate, be protected to ensure that food product is not contaminated by breakages.

**5.1.11** There should be adequate supply of potable water with appropriate facilities for its storage and distribution, whenever necessary, to ensure the safety and suitability of food.

**5.2 Material handling/Process control**

**5.2.1** Potential sources of contamination from the environment should be considered. In particular, primary food production should not be carried out in areas where the presence of potentially harmful substances would lead to an unacceptable level of such substances in food.

**5.2.3** Raw materials should, where appropriate, be inspected and sorted before processing. Stocks of raw materials and ingredients should be subject to effective stock rotation.

**5.2.4** Equipment should be designed to dry, fry, cool or store food product to achieve the required food temperature as rapidly as necessary in the interests of food safety and suitability.

**5.3 Facilities for personnel and personal hygiene**

**5.3.1** Adequate means of hygienically washing and drying hands should be put in place.

**5.3.2** There should be facilities for supply of hot and cold water.

**5.3.3** There should be adequate changing facilities for personnel.

**5.3.4** There should be facilities suitably located and designated for cleaning equipment such as washing trough, hydraulic press, hammer mill, dryer, steeping tanks, other equipment, and the floor. Taps should be installed at the tops of the washing trough and steeping tanks. Also outlets such as stoppers for easy draining at the top and base of each facility should be installed.

**5.3.5** The personnel who have direct contact with the product should maintain an appropriate level of personal cleanliness because they cause contamination to the product.

* + 1. Visitors to the food manufacturing, processing, or handling areas should, where appropriate, wear protective clothing and follow the other personal hygiene provisions in this section.

**5.3.7** A cloak room should be provided for staff to change into factory safety wear. The use of factory safety wear will minimize the introduction of undesirable micro-organisms from soil and dust carried on the clothing of staff when they report to work.

**6.0 Water Supply**

i. There should be a supply of Portable water, under adequate pressure and suitable temperature.

ii. Steam used in direct contact with food or food contact surface should not contain substances which may be hazardous to health or contaminate the food.

**7.0 Drainage and waste disposal**

**7.1** Adequate drainage and waste disposal systems and facilities should be provided. They s should be designed and constructed to avoid any risk of contaminating food or the potable water supply.

**7.2** Adequate, suitable and conveniently located changing facilities and toilets should be provided in the factory.

Toilet should be designed as to ensure hygienic removal of waste matter. These area should be well lit, ventilated and should not open directly on to food processing areas. Hand –washing facilities, a suitable hand cleaning preparation and with suitable hygienic means of drying hand should be provided adjacent to the toilet and in such a position that all the employee must pass them when returning to the processing area. Notices should be posted directing personnel to wash their hands after the use of the toilet.

**7.3** **Storage Facilities**

Adequate facilities should be provided for the storage of food, ingredients and non food chemicals (e.g. cleaning materials, lubricants, fuels).Where appropriate, food storage facilities shall be designed and constructed to:

* Permit adequate maintenance and cleaning.
* Avoid pests and harborages.
* Enable food to be effectively protected from contamination during storage.
* Provide an environment which minimizes the deterioration of food (e.g. by temperature and humidity control).

**8.0 Criteria for conformity**

A lot shall be declared as acceptable if the production and handling processes conform to the provisions of this Code of practice**.**

**9.0 Bibliography**

* NIS :2013 - Nigerian Industrial Standard for High Quality Cassava Flour
* NIS 343:2004 - Nigerian Industrial Standard for Cassava chips
* NIS 556:2007 - Nigerian Industrial Standard for Food Grade Ethanol
* NIS 181:1983 - Nigerian Industrial Standard for Garri
* NIS386:2004 - Nigerian Industrial Standard for Starch (Food and Industrial Grade)
* Code of Hygienic Practice for Fresh Fruits and Vegetables. Codex Standard CAC/RCP 53
* Draft East African Standard DEAS 776:2012 Production and handling of fresh cassava – Code of practice.
* IITA Integrated Cassava Project on (Gari, Ethanol, Edible Flour).
* Ghana Standard for Fresh Sweet Cassava 2004
* CODEX STAN 151 -1995 CODEX Standard for Gari
* USAID/CORAF/SONGHAI (2010) Processing of Cassava into Gari and High Quality Cassava flour in West Africa Draft Manual