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**Code of hygienic practice for dried fruits**

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In order to match with technological development and to keep continuous progress in industries, standards are subject to periodic review. Users shall ascertain that they are in possession of the latest edition

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## Foreword

Rwanda Standards are prepared by Technical Committees and approved by Rwanda Standards Board (RSB) Board of Directors in accordance with the procedures of RSB, in compliance with Annex 3 of the WTO/TBT agreement on the preparation, adoption and application of standards.

The main task of technical committees is to prepare national standards. Final Draft Rwanda Standards adopted by Technical committees are ratified by members of RSB Board of Directors for publication and gazettment as Rwanda Standards.

RS 207 was prepared by Technical Committee RSB/TC 038, *Processed fruits and vegetables*.

In the preparation of this standard, reference was made to the following standard (s):

- 1) CAC/RCP 3-1969: Code of hygienic practice for dried fruits

The assistance derived from the above source is hereby acknowledged with thanks.

The first edition (RS 207: 2014) has been reaffirmed by the Board on dd-mm-yyyy.

## Committee membership

The following organizations were represented on the Technical Committee on *Processed fruits and vegetables* (RSB/TC 038) in the preparation of this standard.

Africa Food Supply Ltd

Benya Co. Ltd

Dry Fruits Ltd

Good believers Ltd

MIECA Ltd

National Agricultural Export Development Board (NAEB)

National Industrial Research and Development Agency (NIRDA)

NETRAPI Ltd

NORELGA MACADAMIA

Nyarutarama Business Incubation Center (NBIC)

Paragraph of participants Natural Fruits Dried Co Ltd

Rwanda NUT Company

SHEKINA Enterprise

SORWATOM

TUZAMURANE Cooperative

University of Rwanda, College of Agriculture, Animal Sciences and Veterinary Medicine (UR-CAVM)

ZIMA Enterprise

Rwanda Standards Board (RSB) – Secretariat

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# Code of hygienic practice for dried fruits

## 1 Scope

This standard applies to all fruits that have been dried by natural or artificial means or a combination of both. The fruit is dried to the extent that the greater part of the moisture has been removed and in addition the fruit may be subjected to a safe and appropriate treatment in preparation and packing, to permit marketing in normal trade channels. Fruits other than vine fruits prior to drying, if desired, and applicable for the particular fruit, may be cored, or pitted, sliced, diced, quartered, halved, or otherwise subdivided. This standard does not apply to fruits commonly known as “dehydrated fruits” with a moisture content not exceeding 5%.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

RS EAS 12, *Potable water — Specification*

## 3 Terms and definitions

## 4 There are no terms and definitions Raw material requirements

### 4.1 Environmental sanitation in growing and food production areas

#### 4.1.1 Sanitary disposal of human and animal wastes

Adequate precaution should be taken to ensure that human and animal wastes are disposed of in such a manner as not to constitute a public health or hygienic hazard and extreme care should be taken to protect the fruit from contamination with these wastes.

#### 4.1.2 Sanitary quality of irrigation water

Water used for irrigation should not constitute a public health hazard to the consumer through the fruit.

#### 4.1.3 Animal, plant pest and disease control

Growing areas should be kept free from rotten or decomposing fruit that is attractive to insects, rodents and birds. Where control measures are undertaken, treatment with chemical, biological or physical agents should be done only in accordance with the recommendations of the appropriate official agency, by or under the direct supervision of personnel with a thorough understanding of the hazards involved, including the possibility of toxic residues being retained by the fruit.

## **4.2 Sanitary harvesting and food production**

### **4.2.1 Equipment and product containers**

Equipment and product containers should not constitute a hazard to health. Containers which are reused should be of such material and construction as to facilitate thorough cleaning, and should be so cleaned and maintained as not to constitute a source of contamination to the fruit.

### **4.2.2 Sanitary techniques**

Harvesting and production operations, methods and procedures should be clean and sanitary.

### **4.2.3 Removal of obviously unfit materials**

Unfit products should be segregated during harvesting and production to the fullest extent practicable and should be disposed of in an appropriate manner. The harvested fruit should be examined by competent persons to ensure that it is fit for further processing into food.

### **4.2.4 Protection of product from contamination**

Suitable precautions should be taken to prevent the raw fruit from being contaminated by animals, insects, vermin, birds, chemical or microbiological contaminants or other objectionable substances during handling and storage. The nature of the fruit and the methods of harvesting shall indicate the type and degree of protection required. The raw or dried fruit should be moved to suitable storage or to the processing area for immediate processing, as soon as possible after harvesting or drying. Where fruits are likely to have become infested with insects or mites during or after harvesting or drying as a preventive measure, suitable treatment such as fumigation should be applied. Fruit held for processing should be stored in closed containers, buildings or under suitable type of covering that protects it from rodents, insects, birds, debris and dust. Fumigation methods and chemicals used should be approved by legal authorities having jurisdiction.

### **4.2.5 Drying yards**

Where fruit is dried by the sun in drying yards, such yards should be recognized as food processing yards whether drying is carried out on a grower's property or as a commercial operation. Such yards should as far as possible comply with such of the provisions of clause 4 of this standard as are applicable and in particular with the requirements specified in 4.2.5.1-4.2.5.3.

#### **4.2.5.1 Location**

Drying yards should in all cases be located at sufficient distance from cattle feed lots, setting pods and/or other waste collection areas to prevent contamination from these sources. They should also be so located that they have proper and adequate drainage.

#### **4.2.5.2 Construction**

**4.2.5.2.1** The drying yard should be so surfaced to permit maintenance of clean yard surfaces and prevent contamination of drying fruit. The drying yard should be fenced, where necessary, to keep out animals as far as practicable and the area around the drying yard should be kept clean, free from weeds and other debris that can blow into the yard.



**4.2.5.2.2** Cutting sheds in which fruit is pitted, cut or otherwise prepared and spread on trays for drying should preferably be closed buildings with screened windows that do not permit access by rodents, insects or birds. Where cutting is done in open sheds, adequate precautions should be taken to protect against insect, rodent and bird contamination or harbourage. The sheds should be adequately lit and ventilated and adequate, clean toilet and handwashing facilities should be provided.

**4.2.5.2.3** Both fresh fruit for processing and the dried fruit should be stored in areas where it is protected from rodent, insect and bird depredations and storage time should be kept to a minimum consistent with good manufacturing practice.

**4.2.5.2.4** There should be an adequate supply of clean potable water for hand washing, equipment cleaning and raw product washing. Standards of potability shall not be less than those contained in RS EAS 12

#### **4.2.5.3 Hygienic operating requirements**

Drying trays, cutting equipment and storage bins should be kept clean and free from fruit residue and foreign substances that may cause contamination of the fruit.

### **4.3 Transportation**

#### **4.3.1 Facilities**

Conveyance for transporting the harvested crop or raw product from the production area, place of harvest or storage should be adequate for the purpose intended and should be of such material and construction should permit thorough cleaning and should be so cleaned and maintained as not to constitute a source of contamination to the fruit.

#### **4.3.2 Handling procedures**

All handling procedures should be such as to prevent the product from being contaminated. Extreme care should be taken in transporting perishable products to prevent spoilage or deterioration. Special equipment such as refrigeration equipment should be used if the nature of the product or distances involved so indicate if ice is used in contact with the fruit, it should be of sanitary quality as required in 5.1.2.3.

## **5 Plant facilities and operating requirements**

### **5.1 Plant construction and layout**

#### **5.1.1 Location, size and sanitary design**

The building and surrounding area should be such as can be kept reasonably free of objectionable odours, smoke, dust, or other contamination; should be of sufficient size for the purpose intended without crowding of equipment or personnel; should be of sound construction and kept in good repair; should be of such construction as to protect against the entrance or harbouring of insects or birds or vermin and should be so designed as to permit easy and adequate cleaning. In areas experiencing high concentrations of air-borne pollutants, equipment should be used to remove pollutants from the air blown across or through the product.

## **5.1.2 Sanitary facilities and controls**

### **5.1.2.1 Separation of processes**

Areas where raw materials are received or stored should be so separated from areas in which final product preparation or packaging is conducted as to preclude contamination of the finished product. Areas and compartments used for storage, manufacture or handling of edible products should be separate and distinct from those used for inedible materials. The food handling area should be completely separated from any part of the premises used as living quarters

### **5.1.2.2 Water supply**

An ample supply of cold water should be available and an adequate supply of hot water where necessary. The water supply should be of potable quality. Standards of potability shall not be less than those contained in RS EAS 12.

### **5.1.2.3 Ice**

Ice should be made from water of potable quality and should be manufactured, handled, stored and used, so as to protect it from contamination.

### **5.1.2.4 Auxiliary water supply**

Where non-potable water is used for such purposes as fire control, it shall be carried in completely separate lines, identified preferably by colour and with no cross-connection or back siphonage with the lines carrying potable water.

### **5.1.2.5 Plumbing and waste disposal**

All plumbing and waste disposal lines (including sewer systems) shall be large enough to carry peak loads. All lines shall be water-tight and have adequate traps and vents. Disposal of waste should be effected in such a manner as not to permit contamination of potable water supplies. The plumbing and the manner of waste disposal should be approved by the official agency having jurisdiction.

### **5.1.2.6 Lighting and ventilation**

Premises should be well lit and ventilated. Special attention should be given to the venting of areas and equipment producing excessive heat, steam, obnoxious fumes or vapours or contaminating aerosols. Good ventilation is important to prevent both condensation (which may drip into the product and mould growth in overhead structures which growth may fall into the food. Light bulbs and fixtures suspended over food in any step of preparation should be of the safety type or otherwise protected to prevent food contamination in the case of breakage.

### **5.1.2.7 Toilet rooms and facilities**

Adequate and convenient toilets should be provided and toilet areas should be equipped with self-closing doors. Toilet rooms should be well lit and ventilated and should not open directly into a food handling area. They should be kept in a sanitary condition at all times. There should be associated hand-washing facilities

within the toilet area and the notices should be posted requiring personnel to wash their hands after using the toilet.

#### **5.1.2.8 Hand-washing facilities**

Adequate and convenient facilities for employees to wash and dry their hands should be provided wherever the process demands. They should be in full view of the processing floor. Single-use towels are recommended where practicable but otherwise the method of drying should be approved by the official agency having jurisdiction. The facilities should be kept in a sanitary condition at all times.

### **5.2 Equipment and utensils**

#### **5.2.1 Materials**

All food contact surfaces should be smooth, free from pits, crevices and loose scale, non-toxic, unaffected by food products and capable of withstanding repeated exposure to normal cleaning and non-absorbent unless the nature of a particular and otherwise acceptable process renders the use of a surface such as wood, necessary.

#### **5.2.2 Sanitary design, construction and installation**

Equipment and utensils should be so designed and constructed as to prevent hygienic hazards and permit easy and thorough cleaning. Stationary equipment should be installed in such a manner as to permit easy and thorough cleaning.

#### **5.2.3 Equipment and utensils**

Equipment and utensils used for inedible or contaminating materials should be so identified and should not be used for handling edible products.

#### **5.2.4 Drying equipment**

Equipment used for drying should be so constructed and operated that the product cannot be adversely affected by the drying medium.

### **5.3 Hygienic operating requirements**

While additional and more specific requirements may be established for certain products, requirements in 5.3.1-5.3.6 should apply as minimal in all food production, handling, storage and distribution.

#### **5.3.1 Sanitary maintenance of plant, facilities and premises**

The building, equipment, utensils and all other physical facilities of the plant should be kept in good repair and should be kept clean and maintained in an orderly, sanitary condition. Waste materials should be frequently removed from the working area during plant operation and adequate waste receptacles should be provided. Detergents and disinfectants employed should be appropriate to the purpose and should be so used as to present no hazard to public health.

### **5.3.2 Vermin control**

Effective measures should be taken to protect against the entrance into the premises and the harbourage on the premises of insects, rodents, birds or other vermin.

### **5.3.3 Exclusion of domestic animals**

Dogs, cats and other domestic animals should be excluded from areas where food is processed or stored.

### **5.3.4 Personnel health**

Plant management should advise personnel that any person afflicted with infected wounds, sores, or any illness, notably diarrhoea should immediately report to management. Management should take care to ensure that no person, while known to be affected with a disease capable of being transmitted through food or known to be a carrier of such disease microorganisms, or while afflicted with infected wounds, sores or any illness, is permitted to work in any area of a food plant in a capacity in which there is a likelihood of such person contaminating food or food contact surfaces with pathogenic organisms.

### **5.3.5 Toxic substances**

All rodenticides, fumigants, insecticides or other toxic substances should be stored in separate locked rooms or cabinets and handled only by properly trained personnel. They should be used only by or under the direct supervision of personnel with a thorough understanding of the hazards involved including the possibility of contamination of the product.

### **5.3.6 Personnel hygiene and food handling practices**

**5.3.6.1** All persons working in a food plant should maintain a high degree of personal cleanliness while on duty. Clothing including suitable headress should be appropriate to the duties being performed and should be kept clean.

**5.3.6.2** Hands should be washed as often as necessary to conform to hygienic operating practices.

**5.3.6.3** Spitting, eating and the use of tobacco or chewing gum should be prohibited in food handling areas.

**5.3.6.4** All necessary precautions should be taken to prevent the contamination of the food product or ingredients with any foreign substance.

**5.3.6.5** Minor cuts and abrasions on the hands should be appropriately treated and covered with a suitable waterproof dressing. Adequate first-aid facilities should be provided to meet these contingencies so that there is no contamination of the food.

**5.3.6.6** Gloves used in food handling should be maintained in a sound, clean and sanitary condition, gloves should be made of an impermeable material except where their usage would be inappropriate or incompatible with the work involved.

## 5.4 Operating practices and production requirements

### 5.4.1 Raw material handling

#### 5.4.1.1 Acceptance criteria

The raw material should not be accepted by the plant if known to contain decomposed, toxic or extraneous substances which shall not be removed to acceptable levels by normal plant procedures of sorting or preparation.

#### 5.4.1.2 Storage

Raw materials stored on the plant premises should be maintained under conditions that shall protect against contamination and infestation and minimize deterioration.

#### 5.4.1.3 Water

Water used for conveying raw materials into the plant should be from such a source or suitably treated as not to constitute a public health hazard and should be used only by permission of the official agency having jurisdiction.

### 5.4.2 Inspection and sorting

Prior to introduction into the processing line, or at a convenient point within it, raw materials should be inspected, sorted or culled as required to remove unfit materials. Such operations should be carried out in a clean and sanitary manner. Only clean, sound materials should be used in further processing.

### 5.4.3 Washing or other preparation

Raw materials should be washed as needed to remove soil or other contamination. Water used for such purposes should not be recirculated unless suitably treated to maintain it in a condition as not to constitute a public health hazard. Water used for washing, rinsing or conveying should be of potable quality.

### 5.4.4 Preparation and processing

Preparatory operations leading to the finished product and the packaging operations should be so timed as to permit expeditious handling of consecutive units in production under conditions which would prevent contamination, deterioration, spoilage, or the development of infectious or toxigenic microorganisms.

### 5.4.5 Packaging of finished product

**5.4.5.1 Materials:** Packaging materials should be stored in a clean and sanitary manner and should not transmit to the product objectionable substances beyond limits acceptable to the official agency having jurisdiction and should provide appropriate protection from contamination.

**5.4.5.2 Techniques:** Packaging should be done under conditions that preclude the introduction of contamination into the product.

#### **5.4.6 Preservation of finished product**

Methods of preservation or treatment of the finished product should be such as to kill any insects or mites remaining after processing and to result in protection against contamination, deterioration or development of a public health hazard. The finished product should be of such moisture content that it can be held in the localities of origin and distribution under any normally foreseeable conditions for those localities without significant deterioration by decay, mould, enzymatic changes or other causes. In addition to applicable drying, the finished product may be treated with chemical preservatives at levels approved by the codex alimentarius commission as referenced in the codex commodity standards, heat processed and/or packed in hermetically sealed containers so that the product shall remain safe and not spoil under normal non-refrigerated storage conditions.

#### **5.4.7 Storage and transport of finished products**

The finished products should be stored and transported under such conditions as to preclude the contamination with or development of pathogenic or toxigenic microorganisms and protect against rodent and insect infestation and deterioration of the product or of the container:

- a) the product should be stored under suitable conditions of time, temperature, humidity and atmosphere, to prevent significant deterioration.
- b) where dried fruits are stored under conditions in which they may become infested by insects and mites, appropriate methods of protection should be used regularly. Dried fruits should be stored in such a manner that they can be fumigated in situ or so stored that they can be removed elsewhere for fumigation in special facilities (e.g. fumigation chambers, steel barges, etc.). Cold storage can be used, either to prevent infestation in localities where insects are likely to be present in ordinary storage or to prevent insects damaging the fruit.

#### **5.5 Sanitation control programme**

It is desirable that each plant in its own interest designate a single individual, whose duties are preferably divorced from production, to be held responsible for the cleanliness of the plant. His staff should be a permanent part of the organization and should be well trained in the use of special cleaning tools, methods of disassembling equipment for cleaning and in the significance of contamination and the hazards involved. Critical areas, equipment for cleaning and materials should be designated for specific attention as part of permanent sanitation schedule.

#### **5.6 Laboratory control procedures**

In addition to any control by the official agency having jurisdiction, it is desirable that each plant in its own interest should have its own or access to laboratory control of the sanitary quality of the products processed. The amount and type of such control shall vary with the fruit as well as the needs of management. Such control should reject all fruits that are unfit for human consumption. Analytical procedures should follow recognized or standard methods in order that the results may be readily interpreted.

### **6 End product specifications**

Appropriate methods should be used for sampling, analysis and determination in the following specifications:

- a) to the extent possible in good manufacturing practice the products should be free from objectionable matter;
- b) the products should not contain any pathogen microorganisms or any toxic substance originating from microorganisms; and
- c) the products should comply with the requirements set forth by the codex alimentarius commission on pesticide residues and food additives.

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## Bibliography

[1] RS 207: 2014, *Code of hygienic practice for dried fruits, First edition.*

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