



## **DRAFT TANZANIA STANDARD**

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**Food hygiene – General standard for irradiated foods**

**TANZANIA BUREAU OF STANDARDS**

# Food hygiene – General standard for irradiated foods

## 0. Foreword

Food irradiation is the processing of food products by ionizing radiation in order to, among other things, control foodborne pathogens, reduces microbial load and insect infestation, inhibit the germination of root crops, and extend the durable life of perishable produce. Many countries are using industrial irradiators for processing of food products for commercial purposes.

This standard has been prepared to ensure that radiation processing of food products is implemented safely and correctly and to ensure that irradiated food products that enter into international trade conform to acceptable standards of radiation processing and are correctly labelled.

In preparation of this standard considerable help was derived from (Codex Stan 106-1983 Rev.1-2003) Food hygiene – General standard for irradiated foods published by Codex Alimentarius Commission.

## 1. Scope

This standard applies to foods processed by ionizing radiation that is used in conjunction with applicable hygienic codes, food standards and transportation codes. It does not apply to foods exposed to doses imparted by measuring instruments used for inspection purposes.

## 2. Normative references

The following referenced documents are indispensable for the application 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.

TZS 109, *Food processing units – Code of hygiene – General*

TZS 538, *Packaging and labelling of foods Labelling*

AFDC 1(1107) DTZS *Food hygiene – Code of practice for radiation processing of food*

TZS 1770, *Hazard Analysis and Critical Control Point (HACCP) System - Requirements for any organization in the food chain*

## 3. Terms and definitions

For the purpose of this standard the following terms and definitions shall apply:

### 3.1 food irradiation

processing of food products by ionizing radiation, specifically gamma rays, X-rays or accelerated electrons.

### 3.2 irradiated food

food products processed by ionizing radiation in accordance with this standard. Such food is subject to all relevant standards, codes and regulations applicable to the non-irradiated counterpart.

### 3.3 dosimetry

measurement of the absorbed dose of radiation at a particular point in a given absorbing medium.

### 3.4 dose (absorbed)

absorbed dose, sometimes referred to simply as 'dose', is the amount of energy absorbed per unit mass of irradiated food product.

### 3.5 dose Uniformity Ratio

The ratio of maximum to minimum absorbed dose in the production lot.

### 3.6 dose Distribution:

spatial variation in absorbed dose throughout the production lot with extreme values being the maximum absorbed dose and the minimum absorbed dose.

### 3.7 dose Limit

minimum or maximum radiation dose absorbed by a food product prescribed in regulations as required for technological reasons. Such dose limits are expressed as ranges or as single lower or upper values (i.e., no part of the food product shall absorb less than or more than a specified amount).

## 4. General requirements for the process

### 4.1 Radiation Sources

The following types of ionizing radiation may be used:

- a) Gamma rays from the radionuclides  $^{60}\text{Co}$  or  $^{137}\text{Cs}$ ;
- b) X-rays generated from machine sources operated at or below an energy level of 5 MeV;
- c) Electrons generated from machine sources operated at or below an energy level of 10 MeV.

### 4.2 Absorbed Dose

For the irradiation of any food, the minimum absorbed dose should be sufficient to achieve the technological purpose and the maximum absorbed dose should be less than that which would compromise consumer safety, wholesomeness or would adversely affect structural integrity, functional properties, or sensory attributes. The maximum absorbed dose delivered to a food should not exceed 10kGy, except when necessary to achieve a legitimate technological purpose.

### 4.3 Facilities and Control of the Process

**4.3.1** Radiation treatment of foods should be carried out in facilities licensed and registered for this purpose by the competent authority.

**4.3.2** The facilities shall be designed to meet the requirements of safety, efficacy and good hygienic practices of food processing.

**4.3.3** The facilities should be staffed by adequate, trained and competent personnel.

**4.3.4** Control of the process within the facility should include the keeping of adequate records including quantitative dosimetry.

**4.3.5** Facilities and records should be open to inspection by appropriate authorities.

**4.3.6** Control should be carried out in accordance with AFDC 1(1107) DTZS.

## 5. Hygiene of irradiated foods

**5.1** The irradiated food should be prepared, processed, and transported hygienically in accordance with the provisions of the recommended TZS 109 including the application of the seven principles of Hazard Analysis and Critical Control Point (HACCP) system as per TZS 1770 where applicable for food safety purposes. Where appropriate, the technical requirements for the raw materials and end product should comply with applicable hygienic codes, food standards, and transportation codes.

**5.2** Any relevant national public health requirement affecting microbiological safety and nutritional adequacy applicable in the country in which the food is sold should be observed.

## 6. Technological requirements

### 6.1 General Requirement

The irradiation of food is justified only when it fulfils a technological requirement and/or is beneficial for the protection of consumer health. It should not be used as a substitute for good hygienic and good manufacturing practices or good agricultural practices.

### 6.2 Food Quality and Packaging Requirements

The doses applied shall be commensurate with the technological and public health purposes to be achieved and shall be in accordance with good radiation processing practice. Foods to be irradiated and their packaging materials shall be of suitable quality, acceptable hygienic condition and appropriate for this purpose and shall be handled, before and after irradiation, according to good manufacturing practices taking into account the particular requirements of the technology of the process.

## 7. Re-irradiation

**7.1** Except for foods with low moisture content (cereals, pulses, dehydrated foods and other such commodities) irradiated for the purpose of controlling insect re-infestation, foods irradiated in accordance with clause 4 and 5 of this standard should not be re-irradiated.

**7.2** For the purpose of this standard, food is not considered as having been re-irradiated when:

- a) the irradiated food is prepared from materials which have been irradiated at low dose levels for purposes other than food safety, e.g. quarantine control, prevention of sprouting of roots and tubers;
- b) the food, containing less than 5% of irradiated ingredient, is irradiated; or when
- c) the full dose of ionizing radiation required to achieve the desired effect is applied to the food in more than one increment as part of processing for a specific technological purpose.

**7.3** The cumulative maximum absorbed dose delivered to a food should not exceed 10 kGy as a result of re-irradiation except when it is necessary to achieve a legitimate technological purpose, and should not compromise consumer safety or wholesomeness of the food.

## 8. Post irradiation verification

When required and where applicable, analytical methods for the detection of irradiated foods shall be used to enforce authorization and labelling requirements.

## 9. Labelling

### 9.1 Inventory Control

For irradiated foods, whether pre-packaged or not, the relevant shipping documents shall give appropriate information to identify the registered facility which has irradiated the food, the date(s) of treatment, irradiation dose and lot identification.

### 9.2 Pre-packaged Foods Intended for Direct Consumption

The labelling of pre-packaged irradiated foods should indicate the treatment and in all aspects should be in accordance with the relevant provisions of the TZS 538.

### 9.3 Foods in Bulk Containers

The declaration of the fact of irradiation should be made clear on the relevant shipping documents. In the case of products sold in bulk to the ultimate consumer, the international (RADURA logo) and the

words “irradiated” or “treated with ionizing radiation” should appear together with the name of the product on the container in which products are placed.

DRAFT FOR STAKEHOLDERS COMMENTS