INTERNATIONAL STANDARDS AND AGREEMENTS IN FOOD IRRADIATION

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ABSTRACT

The economies of both developed and developing countries have been affected by their exported food and agricultural products. Trading policies of food and agricultural products are governed by international agreement as well as national regulations.Trade in food and agricultural commodities may be affected by both principal Agreements within the overall World

Trade Organization (WTO) Agreement, though neither specifically refers to irradiation or irradiated foods. The principal Agreements of WTO are the Technical Barriers to Trade (TBT) Agreement and the Sanitary and Phytosanitary (SPS) Agreement. The SPS of the WTO requires governments to harmonize their sanitary and phytosanitary measures on as wide a basis as possible. Related standards, guidelines and recommendations of international standard setting bodies such as the Codex Alimentarius Commission (food safety); the International Plant Protection Convention (IPPC) (plant health and quarantine); and International Office of Epizootics (animal health and zoonoses) should be used in such a harmonization.International Standarts for Phytosanitary Measures (ISPM) no.18 was published under the IPPC by FAO (April 2003, Rome-Italy). ISPM standard provides technical guidance on the specific prodecure for the application of ionizing radiation as a phytosanitary treatment for regulated pests or articles.Moreover, Codex Alimentarius Commission ,Codex General Standard for Irradiated Foods (Stand 106-1983) and Reccomended International Code of Practice were first published in 1983 and revised in March 2003. Scope of 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.On the other hand national regulations should take account of internationally agreed Codes and Guidelines regarding the irradiation facilities and radiation processing.

1. INTRODUCTION

The World Trade Organization (WTO) which was established in 1995 as a successor of the General Agreement on Tariffs and Trade (GATT) is the only global international organization dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters, and importers conduct their business.

The functions of WTO are: Administering WTO trade agreements, forum for trade negotiations, handling trade disputes, monitoring national trade policies, technical assistance and training for developing countries, and cooperation with other international organizations.

The WTO agreements in international trade of foods and agricultural commodities are: Application of Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT). The SPS of the WTO requires governments to harmonize their sanitary and phytosanitary measures on as wide a basis as possible. Related standards, guidelines and recommendations of international standard setting bodies such as the Codex Alimentarius Commission (food safety); the International Plant Protection Convention (IPPC) (plant health and quarantine); and International Office of Epizootics (animal health and zoonoses) should be used in such a harmonization The TBT seeks to ensure that technical regulations and standards, including packaging, marking and labelling requirements, and analytical procedures for assessing conformity with technical regulations and standards do not create unnecessary obstacles to trade.

2. INTERNATIONAL STANDARDS IN FOOD IRRADIATION

There are few internationally recognised standards and agreements related directly with irradiated foods.The most important of these have been produced by the Codex Alimentarius Commission which was established in 1963, under the aegis of FAO and WHO (Joint FAO/WHO Food Standards Programme). One of the purposes is "protecting the health of consumers and ensuring fair practices in the food trade". The Commission is truly an international body having 165 member countries.

The standards and codes developed by Codex are:

- International Codex General Standard for Irradiated Food (CX STAN 106-1983), Revised Codex General Standard for Irradiated Foods (CX STAN 106-1983, Rev.1-2003)

- International Code of Practice for Radiation Processing of Food (CAC/RCP 19-1979), Revised Recommended International Code of Practice for Radiation Processing of Food (CAC/RCP 19-1979, Rev.1-2003).
- Codex General Standard for Labelling of Prepacked Food (CX STAN1-1985, Rev 1-1991, Rev.2-1999)

2.1.Codex Alimentarius Standards in Food Irradiation

The Codex General Standard for Irradiated Foods (CX STAN 106-1983) was a landmark for food irradiation with its clear recommendation that any food could be considered safe when irradiated up to an overall average absorbed dose of 10kGy. The most important revison of standard in 2003 is "The maximum absobed dose delivered to a food should not exceed 10 kGy, except when neccessary to accieve a legitimate technological purpose.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.

The General Standard for Irradiated Foods recognizes that irradiation is a food process comparable to heating and freezing preservation of food. This Standard comprises following items:

General Requirments for the Process

- Radiation source:Gamma rays from the radionuclides Co-60 or Cs-137; X rays and electrons generated from machine sources operated at or below an energy level 5 Mev for X rays and 10 Mev for electrons.
- Absorbed doses: The maximum absobed dose delivered to a food should not exceed 10 kGy, except when neccessary to accieve a legitimate technological purpose.
- Facilities and Control of the Process:Licensing, registration and designing of facilities, qualification of staff for operation, recording of data and control.

Hygiene of Irradiated Foods

- Hygienic conditions: the irradiated food should be prepared, processed, and transported hygienically in accordance with the provisions of the Recommended International Code of Practice- General Principles of Food Hygiene (CAC/RCP 1-1969, Rev.3-1997).

Technological Requirments

- General Requirments:The irradiation of food is justified only when it fulfils a technological requirment and/or is beneficial for the protection of consumer health.
- Food Quality and Packaging Requirments: Foods to be irradiated and their packaging materials shall be of suitable quality.

Re-Irradiation

- Reinfestation:Foods (cereals, pulses, dehydrated foods and other such commodities) with low moisture content can be re-irradiated for the purpose of controlling insect reinfestation.
- Exceptions:Irradiation at low dose levels for purposes other than food safety such as quarantine control, prevention of sprouting of roots and tubers, the foods which contain less than 5 % of irradiated ingredients, and application of full dose in more than one increment as part of processing for a specific technological purpose.And also exceeding 10 kGy to achieve a legitimate technological purpose.

Post Irradiation Verification

When required and where applicable, analitical methods which were adopted by the Codex Commission for the detection of irradiated foods may be used to enforce authorization and labeling requirments.

Labelling

- Inventory Control:Relavent shipping documents should give necessary information for irradiated foods.
- Prepacked Foods Intended for Direct Consumption: Prepacked foods labelling should be in accordance with the relevant provisions of the Codex General Standard for the Labelling of Prepacked Foods (CX STAN 1-1985. Rev.2-1999)

2.2. Recommended International Code of Practice for Radiation Processing of Food

This Codex Code of Practice for Radiation Processing of Food (CAC/RCP19-1979, Rev.1-2003) identifies the essential practices to be imlemented to achive effective radiation processing of food products in a manner that maintains quality and yields food products that are safe and suitable for consumption.The regulatory control of food irradiation should take into consideration the Codex General Standard for Irradiated Foods(CX STAN 106-1983, Rev.1-2003) and this code.The purpose of regulatory control is well defined in the code.

This code is concerned with food products processed by gamma rays, or accelerated electrons for the purpose of , among other things, control of foodborn pathogens, reduction of microbial load and insect infestation, inhibition of the germination of root crops, and extension of durable life for perishable foods.

This Code covers the requirments of the irradiation process in a facility; it also considers other aspects of the process as primary production and/or harvesting, post-harvest treatment, storage and shipment, packaging, irradiation, labelling, post-irradiation storage and handling, and training. Traing manuals for facility operators and control officials have been produced by the International Consultative Group on Food Irradiation (ICGFI), available through the International Atomic Energy Agency.

2.3.Codex General Standard for The Labelling of Prepacked Foods

The Codex General Standard for Labelling of Prepacked Food(CX STAN1-1985) was first revised(CX STAN1-1985, Rev 1-1991) in 1991.There are three clauses under the item 5.2 IRRADITED FOODS of this standard as following.

- (5.2.1) The label of a food which has been treated with ionizing radiation shall carry a written statement indicating that treatment in close proximity to the name of the food. The use of the international food irradiation symbol, as shown below, is optional, but when it is used, it shall be in close proximity to the name of the food.

- (5.2.2) When an irradiated product is used as an ingredient in another food, this shall be so declared in the list of ingredients.
- (5.2.3) When a single ingredient product is prepared from a raw material which has been irradiated, the label of the product shall contain a statement indicating the treatment.

3. INTERNATIONAL STANDARDS FOR PHYTOSANITARY MEASURES

The World Trade Organization's SPS agreement, ratified April 1996, requires that countries strive towards transparency in their actions with trade partners. IPPC which is administered under Food and Agriculture Organization of the United Nations. IPPC is recognized as the standard setting organization for plant health issues. International standards for phytosanitary measures (ISPM) are prepared by the Secretariat of IPPC as part of Food and Agriculture Organization of the United Nations. International standard for phytosanitary measures (ISPM-18) -Guidelines for the Use of Irradiation as a Phytosanitary Measure was endorsed by the Interim Commission on Phytosanitary Measures in April 2003.

The ISPM-18 standard provides technical guidence on the specific prodecures for the application of ionizing radiation as a phytosanitary treatment for regulated pests or articles. The National Plant Protection Organization (NPPO) is responsible for the phytosanitary aspects of evaluation, adaptation and use of irradiation as a phytosanitary measure.

The treatment objective of using irradiation as a phytosanitary measure in the standard is to prevent the introduction or spread of reguleted pests. This may be realized by achieving certain responses in the targeted pests such as :

- Mortality
- Preventing successful development (e.g. non-emergence of adults)
- Inability to reproduce (e.g. sterility)
- Inactivation

Phytosanitary uses irradiation also include the devitalization of plants (e.g. seeds may germinate but seedings do not grow; or tubers, bulbsor cuttings do not sprout). NPPO of the importing country is responsible to define the required treatment efficacy.

Ionizing radiation treatment, application, dosimetry, approval of irradiation facility, phytosanitary system integrity, documentation by the treatment facility, and inspection and phytosanitary certification by the NPPO are explained as item by item in the standard.

4. THE INTERNATIONAL CONSULTATIVE GROUP ON FOOD IRRADIATION

The International Consultative Group on Food Irradiation (ICGFI) was established in May 1984 under the aegis of the Food and Agriculture Organisation (FAO), the International Atomic Energy Agency (IAEA) and the World Health Organisation (WHO), collectively called the "Sponsoring Organisations". Its purpose was to evaluate and advise on global developments in food irradiation and it comprised experts in the field designated by governments. ICGFI was ended in May 2004.ICGFI activities have contributed to re-confirmation of the safety of irradiated foods, as expressed in a standard of the Codex Alimentarius Commission; adoption by the International Plant Protection Convention of Guidelines for the Use of Irradiation as a Phytosanitary Measure under an International Standard for Phytosanitary Measures; establishment of principles for the regulation and control of the process of food irradiation; provision of guidelines for the safe, practical application of the process and training courses and materials for process operators and for officials responsible for regulating the process or its products. ICGFI had also guided to prepare model food irradiation regulation based on Codex General Standard of Irradiated Foods for the different regions such as Asia- Pasific, Near East, Latin America and Africa.

5. CONCLUSION

The latest revisions of Codex Alimentarius Commission -Codex General Standard for Irradiated Foods and Recommended International Code of Practice for Radiation Processing of Food and IPPC- International standards for phytosanitary measures (ISPM-18) will provide an important contribution in international trade of microbiologically safe high quality foods and meet phytosanitary requirments by the widely application of irradiation.

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