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FOOD AND AGRICULTURE ORGANIZATION
OF THE UNITED NATIONS



INTERNATIONAL
ATOMIC ENERGY AGENCY



WORLD HEALTH
ORGANIZATION

**INTERNATIONAL CONSULTATIVE GROUP ON FOOD IRRADIATION
(ICGFI)**

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Addendum to the Report of the 15th ICGFI Meeting

**STATUS REPORTS ON FOOD IRRADIATION
BY MEMBER COUNTRIES OF THE
INTERNATIONAL CONSULTATIVE GROUP ON FOOD
IRRADIATION (ICGFI)**

The Reports contained in this document
were provided to the 15th ICGFI Meeting
held at the IAEA Headquarters, Vienna, Austria
20 to 22 October 1998.

(For restricted distribution)

FOREWORD

The International Consultative Group on Food Irradiation (ICGFI) was established originally by 15 Governments on 9 May 1984, under the aegis of FAO, IAEA and WHO, for an initial period of five years. Its mandate has been extended in 1989, and in May 1994 for another five-year period. ICGFI is composed of experts and other representatives designated by Governments which have accepted the terms of the "Declaration" establishing ICGFI and have pledged to make voluntary contributions, in cash or in kind, to carry out the activities of ICGFI.

The functions of the ICGFI are:

- a. to evaluate global developments in the field of food irradiation;
- b. to provide a focal point of advice on the application of food irradiation to Member States and the Organizations, and
- c. to furnish information as required, through the Organizations, to the Joint FAO/IAEA/WHO Expert Committee on the Wholesomeness of Irradiated Food, and to the Codex Alimentarius Commission.

As of December 1998, the following countries are members of ICGFI:

Argentina, Australia, Bangladesh, Belgium, Brazil, Bulgaria, Canada, Chile, People's Republic of China, Costa Rica, Côte d'Ivoire, Croatia, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Ghana, Greece, Hungary, India, Indonesia, Iraq, Israel, Italy, Republic of Korea, Malaysia, Mexico, Morocco, Netherlands, New Zealand, Pakistan, Peru, Philippines, Poland, Portugal, South Africa, Syrian Arab Republic, Thailand, Tunisia, Turkey, Ukraine, United Kingdom, United States of America, Viet Nam, and Yugoslavia.

Introduction

The International Consultative Group on Food Irradiation (ICGFI) has received the country reports included in this addendum to the Report of the 15th ICGFI Meeting. At the 8th Meeting, ICGFI adopted a format for annual reports included in Annex 1 to this document. The purpose of the format is to ensure that country reports contain information on those aspects of food irradiation, which are of particular interest to ICGFI, in a concise and uniform format.

Member countries of ICGFI are requested to follow the format (see Annex 1) in submitting their annual reports to the Secretariat. Annual reports should be sent whether or not a member country attends the ICGFI Meeting. In case of using facsimile transmission to ensure that the annual report reaches the Secretariat before ICGFI meetings, a clean-typed copy (using A4 paper leaving adequate left margin, i.e. 2.5 cm) should also be sent, ready for reproduction.

It is the intention to maintain the country reports up-to-date. For this reason, designated experts are requested to inform the Secretariat of relevant changes/developments in food irradiation in the country concerned by submitting an updated status report, where necessary; or when country reports submitted previously are still valid, i.e. when there have been no changes regarding food irradiation in the country, to so indicate to the Secretariat.

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ARGENTINA

Commercial Activities: During the present year about 750 tons of food products were irradiated, the same quantity as in 1997.

Legal aspects: During this period the National Atomic Energy Commission was consulted by the Argentine Alimentary Code Commission in order to participate in a revision of this subject. So some modifications were proposed at the level of the national fundamental regulation (Art. N0 174-Anex 1-Apendix A), being the most significant the following:

1.- Introduction of the concept about making new food irradiation clearances considering the concept of classes or groups of food products;

2.- Incorporation of the criteria that there is no consumption risk on foods which were treated up to 70kGy as minimum dose.

Technological aspects:

During the present year the quarantine treatment of fruits (apples) was performed as one of the laboratory experiences. They were related with the irradiation of the *Cydia pomonella* larval stage, in order to verify the quarantine dose requirement to fulfil PROBIT 9 and APHIS-USDA judgments.

Experimental studies on the physicochemical and rheological behaviour of some food ingredients: liquid soy lecithin, and starches of varied origins, decontaminated by gamma irradiation, are being carried out.

As the national health authorities were concerned about regulations on herbs, including microbial load limits and possible decontamination methods, a experimental work on the chemical stability under irradiation of six herbs of wide use in the country was undertaken between the Buenos Aires University and this National Commission of Atomic Energy. During the present year the NAEC made the Spanish translation of the ICGFI document N0 14 as an "in-kind" contribution to the ICGFI yearly activities.

Technological Dissemination Activities:

1. During the present year and in the frame of the ARCAL XXIX project (1997-1998) two meetings were carried out, one of them directed to the Public Health area and the other to the Food Industry. In both events, a good sectorial answer was obtained.

2. The National Atomic Energy Comm. (NAEC) of Argentina was present at the FIAR'98 (International Food Trade Exposition)- Rosario-Argentina, its participation was directed to show the implications of the national and international food irradiation industrial applications. These actions were reflected either at the technological meeting as in its exposition participation. The results obtained were considered as very successful.
3. With the same technological dissemination purpose, the (NAEC) (Bariloche Atomic Center) organized in Bariloche its annual exposition; during its development the visitors received irradiated strawberries as an example of the food irradiation industrial application.
4. The Food Irradiation Sector also advised on the experimental design and performed the irradiation of some wet rice samples with the purpose of extending its shelf life before the application of the industrial drying treatment. The following experimental analysis were carried out by a group of students in the Entre Rios Province, which showed the results of their successful experience at the Annual Secondary School National Meeting on Sciences named "Zero Radioactivity".
5. The NAEC through its food irradiation working group is the permanent consultant of food producers and industries on the feasibility of this technology.

BANGLADESH

The current status of food irradiation in Bangladesh in respect of public acceptance, trade development, commercialization, research and development activities is briefly presented below:

Public Acceptance

Consumer acceptability trials and test marketing of promising food items such as potato, onion, dry fish and pulses were carried out in collaboration with traders and wholesalers. It was found that the consumer accepted irradiated products very favorably, especially when the superior quality and hygiene of the irradiated products were immediately apparent. No inhibition, unfavorable reaction or organized resistance were observed against irradiated foods.

Market Development and Promotion

Pilot and semi-commercial trials and test marketing of promising food items such as potato, onion, dry fish and pulses were carried out in collaboration with traders and wholesalers. Studies on optimum doses, packaging storage conditions, transportation, nutritional aspects and toxicological studies of specific irradiated food items have been undertaken. Techno-economic studies on commercialization of food irradiation technology has been carried out. The scientific community, the consumers association, the potential investors and the public at large have been kept informed about the merits of food irradiation through seminars, symposia and the information media. In addition, we have been delivering lectures on food irradiation to different professional groups; participating in national science fairs and exhibitions to demonstrate irradiated foods and distributing leaflets containing relevant data and information on food irradiation.

Legal Framework for Commercialization

To provide the legal framework for the commercialization of food irradiation and for harmonization of regulation, Bangladesh adopted in 1995 a "Specification for Authorization of Irradiation by Groups/Classes of Foods" in line with the guidelines framed by ICGFI. This authorization for irradiation by groups/classes of foods is essentially similar to the final draft of a Guide to Harmonized Regulations in Food Irradiation within RCA Member States in the Asia-Pacific Region.

Bangladesh promulgated in 1997 a "Nuclear Safety and Radiation Control Act" covering all activities related to nuclear sources and devicing and use of radioactive materials. The establishment and operations of a food irradiation facility will be governed by the provisions of the National Nuclear Safety and Radiation Control Act and the Bangladesh Standards and Testing Institute.

Commercialization of Food Irradiation Technology

A demonstration cum-commercial Co-60 Irradiation plant was set up in March 1993 as a joint venture project (Gammatech Ltd.) of the Bangladesh Atomic Energy Commission and BEXIMCO, a leading private company in the country.

By now, Gammatech Ltd. has irradiated over 1300 tons of different food items brought by the clients and these items have been marketed successfully both at home and abroad. The major food items irradiated include Dried Fish, Frozen foods, Beef Casing and Bean/Pulses. In addition, a number of pharmaceutical items such as shell dressing, plastic bottle, caps, droppers, etc., Magnesium Trisilicate, Magnesium Silicate, Safe delivery kits, Gum accasia and pit soil are being irradiated regularly with the limited strength of the irradiator at Gammatech. The initial strength of the source was about 85 kCi. The present strength of the source is around 40 kCi.

For the export market, the most potential candidate for irradiation is frozen shrimp and other fishes. Presently Bangladesh is exporting about 50-60 thousand tons of frozen fish and the bulk of it is exported through the Chittagong port. The major importing countries are the EEC countries, USA and Japan. With the clearance of irradiated frozen fish in some of these countries, the exporters are expected to be motivated to irradiate their products to meet the quality standards of the importing countries.

Conclusion

Food irradiation technology is now in a take-off stage in Bangladesh. It is now clear that future growth of the technology will depend on the commercial profitability of specific applications. IFRB will continue to provide necessary research and development support in this regard.

BELGIUM

During the last 12 months, we have continued to investigate the industrial potential of irradiation for improving the quality of the ingredients introduced in the food industries.

We are waiting to receive the clearances for the treatment of

- eggwhite.
- deboned poultry meat.

The renewal of three clearances accorded for defined term has been introduced for examination by the Ministry of Public Health.

BRAZIL

1. Regulations of Food Irradiation

The regulations regarding food irradiation in Brazil remain unchanged since 1989. Nevertheless, the National Nuclear Energy Commission is coordinating a national technical group that is preparing a proposal on updated regulations on food irradiation to be presented to the Ministry of Health in a near future.

2. Authorization Applications of Food Irradiation

There have been no amendments to the regulations since 1989.

3. Authorization of Food Irradiation Facilities

- a) A site in Jarinu, SP, (60 km from the city of Sao Paulo) was approved by CNEN (Brazilian Nuclear Energy Commission) for a multipurpose ^{60}Co irradiation plant. The correspondent construction clearance was just obtained.
- b) A site in Manaus, AM, for a private food ^{60}Co irradiation plant was approved but construction clearance is still pending.
- c) A well-established multipurpose ^{60}Co irradiation services company is in the process of duplicating its capability by adding a new irradiator next to the one already existent.
- d) A site in Sao Jose dos Campos, SP, (100 km from the city of Sao Paulo) was approved for a multipurpose electron beam accelerator.
- e) The University of Sao Paulo at Piracicaba, SP (170 km from the city of Sao Paulo) purchased a Nordion irradiator which is in the process of being licensed.
- f) A few other companies have requested information from CNEN about licensing process for food irradiation plants.

4. Market Trials

No market trials have been made so far in the country.

5. Other information

Experimentation is being carried out on applications of irradiation as a means of food preservation at the Biological Institute in Sao Paulo (research on some agricultural pests), the Center of Nuclear Energy applied to Agriculture (CENA) of the University of Sao Paulo and at the Institute of Nuclear and Energy Research (IPEN). At CENA, the preservation of poultry, strawberries, onions, garlic and dairy products is being studied.

At the IPEN laboratories, research on irradiation of food ingredients like egg powder and some food hydrocolloids as well as detection methods for different kinds of food are going on. Two IAEA research contracts on radiation dosimetry of Brazilian fruits and irradiation as a quarantine treatment of insects other than the fruit fly were successfully completed. At the same facility, irradiation of marine rations from the Brazilian Navy are in an experimental phase.

A transport trial of irradiated apples from Argentina to Brasil was performed.

CANADA

There have been no new developments in the past year in the commercialisation of food irradiation. Nor have there been any new clearances granted by Health Canada.

The Canadian Cattlemen's Association filed a petition with Health Canada, to allow the irradiation of red meat, in October 1998.

CHILE

1. Regulations on Food Irradiation

The new Chilean Food Sanitary Regulations* are in force since 1997. These regulations include a chapter on food irradiation and a mandatory labeling. In spite of the preconception of some enterprises which are using ionizing radiation it did not have any negative reaction from consumers.

During 1998, some amendments to these Food Sanitary Regulations have been done in order to harmonize the Chilean legislation with the "Model Regulation on Irradiated Food for Latin American and Caribbean Countries".

2. Authorized Applications of Food Irradiation

According to the amendments mentioned above, Chile will approve this technology by groups of food, not item by item.

3. Food Irradiation Facility

The Multipurpose Pilot Plant of Co-60 has been recharged with 86.174 Ci (3.19 Pbq) so that the actual activity of this facility is 204.684 Ci (7.57 Pbq). Since January to September this Plant has treated a total of 425 metric tons (98 tons of spices and condiments; 227 tons of dry vegetables; 43 tons of frozen food and 57 tons of raw materials).

4. Market Trials

None during 1998.

5. Trials

None. However some interchange of irradiated food products between Chile and Peru/Argentina are in progress, under a regional project (ARCAL XXIX).

6. Other information

Some activities related to the dissemination of technical information directed to 3 groups (consumers, enterprises and public sector) had been carried out. A special brochure for consumers was edited by the Comisión Chilena de Energía Nuclear and Servicio Nacional del Consumidor.

A research work on *Vibrio cholerae* and fresh vegetables (lettuce, celery and cabbage) has been finished. This project is part of a Coordinated Research Project of IAEA and the Pan-American Health Organization.

* It was published in the Food & Environmental Protection Section Newsletter, Vol. 1, No. 1, March 1998.

PEOPLE'S REPUBLIC OF CHINA

In 1997-1998, Food Irradiation activities in China are actively proceeded, although the financial-economical situation in East-South Asia and China was not so good. Commercialization, trade, information exchange are continued as before.

1. Regulations on Food Irradiations

The Regulation for Hygienic Control of Irradiated Foods was issued by the Ministry of Health on 5 April 1996.

2. Authorized Application of Food Irradiation

Up to now, China has authorized application of 18 kinds of irradiated foods: Potato, Onion, Garlic, Peanut, Mushroom, Sausage, Cereal Grains, Apple, Apricot, Spiced Chicken, Cooked Meat Products, Dried Fruits, Litchi, Mandarin, Pork, Sweet Potato Wine, Tomato and Pollen.

From 1995, China has arranged the laboratory and evaluation work for the authorization of food irradiation by classes of food. By the end of June 1997, the hygienic standards of six classes of irradiated foods had been issued, they are:

1. Hygienic standard for irradiated beans, grains and their products.
2. Hygienic standard for irradiated frozen packaged meat of livestock and poultry.
3. Hygienic standard for irradiated fresh fruits and vegetables.
4. Hygienic standard for irradiated dried spices.
5. Hygienic standard for irradiated dried nuts and preserved fruits.
6. Hygienic standard for irradiated cooked meat of livestock and poultry.

The hygienic standard for irradiated seafoods is being prepared. Among the hygienic standards for 18 kinds of irradiated foods, only 3 kinds of single food are still in force.

1. Hygienic standard for irradiated pollen.
2. Hygienic standard for irradiated pork.
3. Hygienic standard for irradiated sweet potato wine.

3. Food Irradiation Facilities

China now has more than fifty ^{60}Co γ irradiation facilities in operation. The total loading capacities are about 12.5 Mci ^{60}Co . They are multipurposed facilities, and situated in different provinces and cities besides Qinghai and Tibet. Following is a list of main food irradiation Gamma Facilities in China. Other Gamma facilities also can be used for food irradiation.

In China, there are forty six industrial EB accelerators in operation. Some can used for food irradiation. Recently, One EB accelerator special for food irradiation has been designed and finished in Zhe Jiang province.

Main Food Irradiation Gamma Facilities in China

Center	Starting Year	Designed Capacity (Kci)	Capacity (Kci)
Beijing	1986	1000	840
Beijing (Agriculture)	1996	500	200
Tianjin	1988	500	270
Shanghai	1986	500	300
Harbin (Guangya)	1989	500	400
Changchun	1996	500	300
Zhengzhou	1986	500	100
Zhengzhou(Isotope Inst.)	1989	300	100

Qingdao	1993	3000	600
Jinan	1987	300	100
Nanjing	1987	500	250
Tangshan	1997	1000	200
Mianyang	1998	500	200
Wujiang (Suzhou)	1994	500	100
Changsha	1989	500	100
Xian	1988	300	100
WuHan	1993	300	200
Shijiazhuang	1989	500	150
Chengdu (SINTA)	1978	500	200
Lanzhou	1987	500	150
Guangzhou	1993	1000	300
Shenzhen	1987	4000	1100
Kunming	1994	500	100
Hainan	1995	500	100
Hangzhou	1981	300	180

4. Market Trials and Commercialization

One marketing test of irradiated foods was finished in Beijing February 1998. The consumer's response are good.

In summary, China produced irradiated foods about 50 thousands tonnes (to end of this year), and 45 thousands tonnes (to end of September, this year).

Irradiated Garlic is the number one in 1998 as before. The total amount of irradiated garlic in China is about 39 thousands tonnes in 1998. The main products irradiated in Zhengzhou, Zhongmu, Henan province (24 thonsauds tonnes), and Jinan, Taian, Jinxiang, Shandong province (15 thousands tonnes).

Spice, pepper, condiment and seasonings are irradiated 5000 tonnes in 1998 in China. About 4000 tonnes from Beijing Radiation Application Center and China Agricultural Radiation Center, others from Tianjin, Chengdu, Hangzhou, Nanjing and others.

Three thousands tonnes of dehydrated vegetables was irradiated in 1998 in China. They are from Beijing, Tianjin, Henan, Shandong, Wuhan, Nanjing, Hangzhou and others.

5. Other Information

The second RCM on Development of safe, the shelf-stable and ready-to-eat food through high-dose irradiation processing was held in 4-8 May 1998 in Beijing.

The National Workshop on Food Irradiation was held in Chengdu, Sichuan, from 10-14 May 1998. The Sichuan Institute for Nuclear Technique Application (SINTA) was the host, cosponsored by the Ministry of Science and Technology (MST), China Atomic Energy Authority (CAEA) and China Isotope and Radiation Association (CIRA). More than 100 persons attended, including 4 foreign guests.

The National Workshop on Food Irradiation for operation management will be held in December 1998 in Beijing. The Chinese Nuclear Agriculture Society will be the host.

A TV Video programme on Food Irradiation will be produced by the China Central Television (CCTV) and the Ministry of Science and Technology (MST).

In China, the Regulation for hygienic control of irradiated foods were issued in 1996 by the Ministry of Health. We will consider the revision of some items according to the harmonization of regulations in RCA Asian Pacific Region and the new issue of the WHO proposal on upper limit of food irradiation dose and the ICGFI proposal on labelling.

In China, the National Coordination Group on Food Irradiation (NCGFI) is responsible for Food Irradiation Coordination affairs. She is very appreciated to and benefit from ICGFI's work:

ICFGFI Guidelines and Recommendations, regulations harmonization, Information dissemination, International Trade, High Dose Irradiation, Training and Workshop.

We hope, ICGFI or his successor will do more contribution to the Food Irradiation Affairs in the forthcoming new century.

CROATIA

Food irradiation in Croatia is regulated legally by the Regulation Concerning the Conditions for the Conservation by Ionizing Radiation of Food and Items of General Use, which is effective since June 1994. The facility authorized under the Regulation for food irradiation activities is the ^{60}Co panoramic irradiator of the Ruđer Bošković Institute, for which the authorization was obtained on 30 January, 1995.

The reconstruction of the electron linear accelerator was nearly completed in 1998. The repair of some subsystems and conditioning of the whole machine under a full load of high voltage, microwave power and high vacuum remain to be done before the extraction of an electron beam becomes possible.

The gamma irradiation facility offers irradiation services to interested industries. During 1998, the following foods were irradiated on a commercial basis:

black pepper	4200 kg
tea herbs	7180 kg
birch leaves	1075 kg
mint leaves	390 kg
marshmallow leaves	3400 kg
chamomile flowers	12500 kg

A product related to food production, but not a food itself, also treated in 1998 was:

peat (sterilization of substrate for soya propagation) 4140 kg

Besides irradiation services offered by the Ruđer Bošković Institute, this Institute and some other institution maintain a research interest in the field of food irradiation. Several scientific, technical and popular articles in the fields of free radical chemistry, dosimetry and areas related to irradiation technology and food irradiation were published.

One of the mandates of the Agency for Handling Special Waste is the promotion of peaceful uses of nuclear energy. This Agency has sponsored a prefeasibility study on the use of irradiation in the national economy including food irradiation in 1998, and has initiated another study on multipurpose irradiation facility.

CUBA

1. *Regulaciones sobre la Irradiación de los Alimentos*

En Cuba está permitido el uso de la energía ionizante en los alimentos desde 1986, existiendo una Norma Cubana que ampara el proceso. Actualmente la norma se haya en proceso de revisión con vistas a adoptar como legislación nacional el documento aprobado en la reunión Regional de Lima, Perú (21-25 de Abril de 1997) que armoniza el proceso en Latinoamerica y el Caribe.

2. *Aplicaciones Autorizadas de Irradiación de Alimentos*

A las aplicaciones reportadas en el suplemento de Food and Environmenal Protection Newsletter Vol 1 No. 2 June 1998 se le adicionan las que se declaran en el anexo.

3. *Autorización de la Instalación*

La Planta de Irradiación de Alimentos del Instituto de Investigaciones para la Industria Alimenticia se encuentra operando con una licencia emitida por el Centro de Seguridad Nuclear, el Centro de protección a las Radiaciones, el Ministerio de Salud Pública y el Ministerio del Interior todos de la República de Cuba.

En estos momentos se encuentra en fase de ejecución de un proyecto de remodelación y recarga de la fuente con el objetivo de convertir la instalación en multipropósito para su empleo en la industria médica farmacéutica con una mayor eficiencia.

Durante 1998 la planta ha procesado más de 20 t de soportes nutricionales en polvo, 2000 t de soportes nutricionales líquidos, 20 t de cocoa, 2 t de leche de soya deshidratada, 30 t de medicamentos varios, 2 t de productos para roedores y diversos tipos de envases.

4. *Pruebas de Mercado*

Se han realizado varias pruebas de soportes nutricionales para grupos vulnerables y pacientes inmunodeprimidos que serán comercializados en 1999.

5. *Investigaciones*

Se han continuado los trabajos con nuevas variedades de frutas, con productos cárnicos y con aportes nutricionales.

6. *Otra Información*

Se concluyeron trabajos relacionados con el efecto de la irradiación sobre el vibrios cholerae en productos alimentarios.

Producto	CODE	Tipo de clearance	Date	Dose max (kGy)
Suplementos Nutricionales para inmunodeprimidos	2,5,8	Incondicional	1-01-95	10.0
Fibra dietética	2,8	Incondicional	1-01-96	5.0
Leche de soya deshidratada	2	Incondicional	1-01-97	5.0
Hierbas aromáticas deshidratada	2	Incondicional	1-01-98	5.0
Miel	3,8	Incondicional	1-01-96	8.0

New decree

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DECREE

of the Ministry of Health

dated November 28th, 1997

**of terms of the radiation treatment of foods, of the maximum permissible radiation dose,
and of the way of designating**

Purpose

(1) This decree states conditions for the application of ultra-violet rays and ionizing radiation for the treatment of foodstuffs, fixes the maximum permissible radiation doses, to which the particular kinds of foodstuffs may be exposed, and the way of marking the foodstuffs so treated.

Labelling

(1) The foods irradiated by ionizing radiation are marked on the cover meant for the consumer, by

- a) inscription "irradiated" and
- b) graphic symbol (logo) presented in encl.no.2,

namely, except for spices, extracts from spices, herbs and herbal parts, which by its nature of use by consumer do not exceed 2% of the food bulk put into circulation, and foodstuffs containing radiation treated food-industry raw material until max. 10 % its bulk.

(2) Print of the inscription according to paragraph 1, lett.a) must be made in a legible and ineffaceable script, located at a well visible place. Graphic symbol according to paragraph 1 lett. b) must be carried out in dark signs on light ground, and in such a combination as to ensure unequivocal identification by consumer.



CZECH REPUBLIC

Groups of foodstuffs permitted to be irradiated by ionizing radiation for some fixed technological and hygienical purposes and maximum permissible absorbed doses of radiation

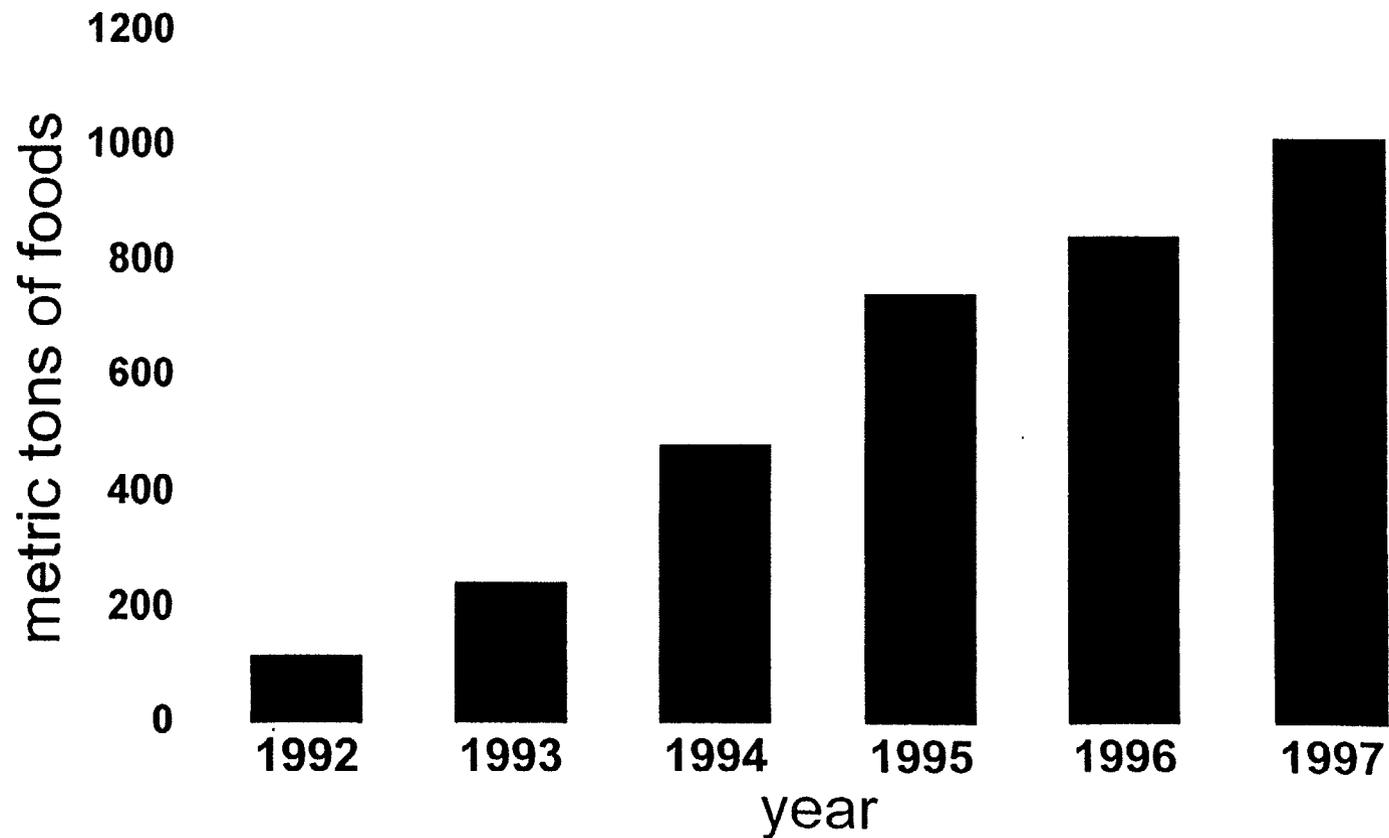
Groups of foodstuffs permitted to be irradiated

- 1. Bulb vegetables, root vegetables, potatoes and produce thereof**
- 2. Fresh fruit and fresh vegetables (other than under 1)**
- 3. Mill cereal produce, dry shell fruits, oil seeds, pulses, dried vegetables and dried fruits**
- 4. Fish, shellfish and frozen frog's legs**
- 5. Poultry meats and other meats**
- 6. Dried vegetables, spices and herbal teas**
- 7. Dried fish and dried meats**

Full text of the decree you can read

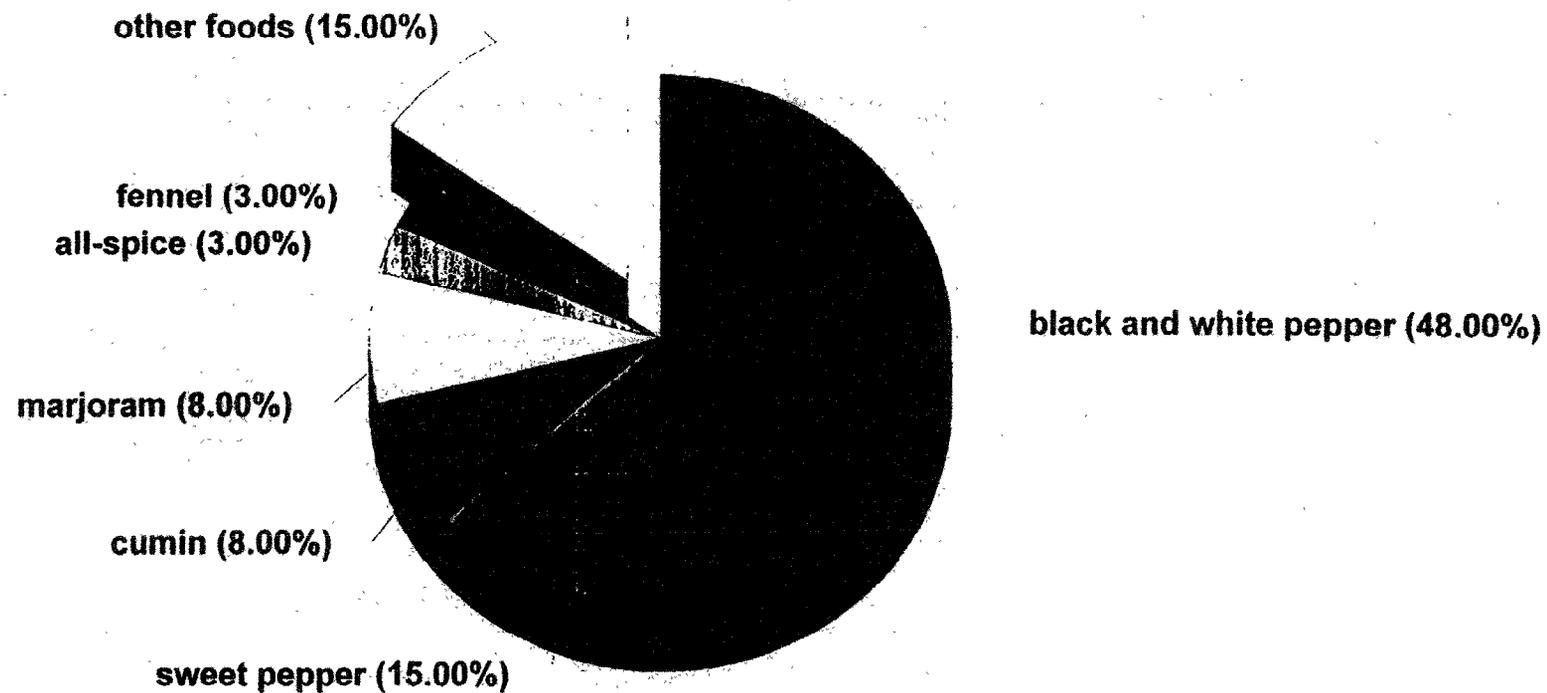
<http://www.chpr.szu.cz/legis/legis.html>

Total quantity of irradiated foods in the Czech Republic during period 1992-1997



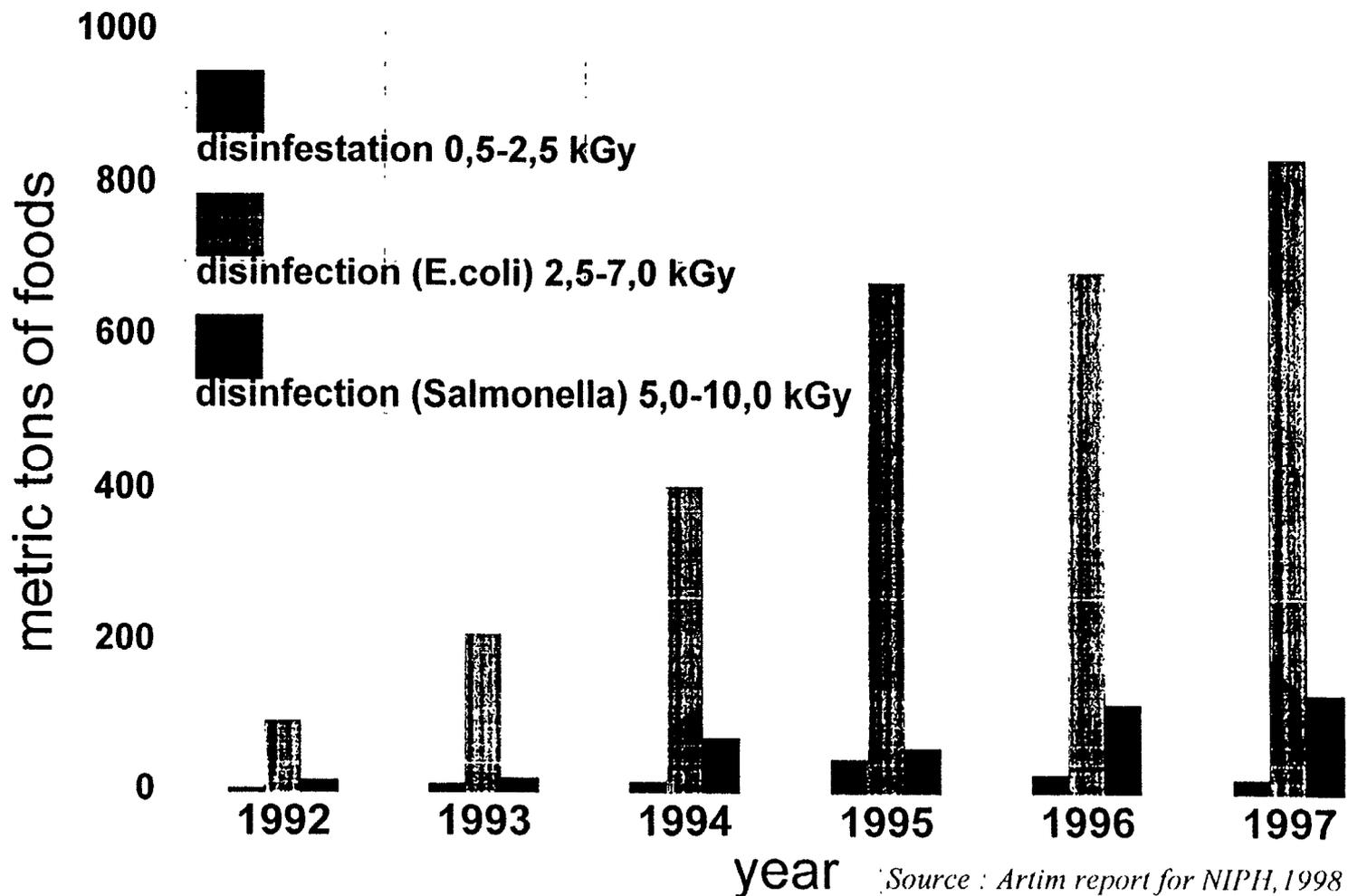
Source : Artim report for NIPH, 1998

Variety of irradiated foods in the Czech Republic during period 1992-1997



Source : Artim report for NIPH, 1998

Quantity of irradiated foods in the Czech Republic during period 1992-1997 - according to reasons



EGYPT

Regulation on Food Irradiation

In October 1997, the Egyptian Organization for Standardization and Quality Control adopted and issued the Egyptian Standard no. 3220/97 for irradiated food intended for human consumption which includes the use of irradiated spices, herbs, dried onion and dried garlic with an overall average dose of up to 10 kGy.

Authorization of Food Irradiation Facilities

I. Commercial Facilities:

- In October 1997, the activity of the Egypt-Mega Gamma-1 Cobalt-60 commercial facility at the National Center for Radiation Research and Technology (NCRRT), Atomic Energy Authority (AEA) was increased by about 100 kCi. In addition, the facility source rack was replaced by two racks, one was loaded with 104 kCi to be used for food irradiation, while the other one was loaded with 384 kCi and the total activity of both racks reached 488 kCi, and are being used for medical sterilization purposes.

- An Electron -beam Accelerator: power 1.5 Mev, variable current 1-25 MA, conveyor speed from 0.6m/min and provided with processing system for industrial irradiation has been used for the first time since September 1998 at NCRRT.

- An industrial commercial facility will be installed in the near future in Alexandria.

II. Experimental Facilities:

- A new Russian Medical Sterilizer CM-20 Gamma Cell for experimental irradiation (20 kCi) has been used since January 1998 at the Nuclear Research Center (NRC).

- A new Russian TENEX Gamma Cell for experimental irradiation (16 kCi) has been used since May 1998 at NCRRT.

- Now six experimental irradiation facilities are being used at AEA.

Market Trials

Market tests and consumer acceptance studies on irradiated foods approved by the Egyptian National Authorities (ENA) are being carried out by AEA with the cooperation with food industries.

Trials

About 325 tons of irradiated dried onion, dried garlic, herbs and spices were irradiated at the NCRRT Cobalt-60 commercial facility since the ENA approved the use of these irradiated food products.

Other information

- Recent research activities in the field of food irradiation have now moved to the stage leading to commercialization.
- Research studies into detection methods for irradiated food are being undertaken through the cooperation between AEA and universities.
- A one-day national seminar on food irradiation was held in December 1997 in Alexandria.
- General information to create public awareness on the benefits and safety of using food irradiation technology had been made since the approval of ENA to use irradiated food items, through radio and TV, newspapers, magazines and booklets.

GERMANY

The ban on food irradiation in Germany continues to be valid. No new exemptions according to §47a LMBG (Federal Food Act) have been applied for.

On 27 October 1997 the Council of Ministers of the EU has arrived at a 'Common Position (EC)' to harmonize the food laws of the member states with regard to food irradiation. It consists of a directive on the principles and a supplementary directive containing the list of permitted applications, at present only spices. The proposal has been discussed and accepted by the European Parliament with requests for several modifications. It is expected that a compromise will be reached soon between Parliament and Council.

German authorities and research institutes continue actively to contribute to the establishment of official methods for the identification of irradiated food. The number of official methods under §35 of the Federal Food Act has increased to 13 (7 methods applying electron-spin-resonance spectroscopy, 3 methods using thermoluminescence analysis and 3 methods employing gas-chromatographic analysis of hydrocarbons). It is expected that the 5 CEN-standards for detection of irradiated food soon are taken over into German law.

The Federal Ministry of Public Health has initiated a research programme into possible consequences of packaging materials irradiated before use for food packaging or intended for irradiation while in contact with food. Research grants were placed; the final report has been submitted, however, it is not yet publicly accessible.

The FRCN, Karlsruhe is continuing to provide and expand services including food irradiation on the WorldWideWeb:

<http://www.dainet.de/bfe/>

The 'Bibliography on Irradiation of Foods' until 1996 is already available as an interactive service including search and retrieval. Depending on demand, printed copies of the Bibliography might no longer be available in future.

GHANA

With the Standard of Irradiated Foods in place, the activities on Food Irradiation were geared towards creating awareness in irradiated foods.

Pilot scale studies and Technology transfer

Maize

Irradiation of maize has been started with the irradiation of 120 bags (50 kg) each and storing for six months.

Yam

Following the construction of two new yam barns, about 5,000 tubers of yam were purchased, irradiated and stored in one barn for six months. In order to introduce the technology to farmers, one farmer was invited to store his yams after irradiation in one of our barns.

Test marketing

In July the farmer collected his yams (about 1500) and sold them in market. According to the farmer his price was higher than those on the market. He was able to make about three times more money than would have been made from the same quantity of yams that were present on the market. This was the lean season and yams on market were shrunken and sprouted compared to his fresh and unsprouted yams.

Yams that were stored by the Department was sold to two categories of people:

- a. the staff and residents of G.A.E.C. (about 1,500) at the same price as unirradiated yams on the market. About 80% of the people bought irradiated yams and came back to buy more.
- b. Two groups of yam sellers who heard about the yams came and bought about 500 tubers which they sold in no time and came back for another 500 tubers.

Irradiated Food Fair

The first ever food fair with irradiated food items in Ghana was organised on the 6th of August, 1998. The objective was to create public awareness and to 'outdoor' irradiated foods to Ghanaians. The target groups for the fair were members of Parliament, people in the Government, research institutions, media, universities, industry and farmers associations.

The fair comprised:

- i. an opening ceremony
- ii. a visit to the gamma irradiator
- iii. an exhibition of photographs and live exhibits
- iv. tasting of various local dishes prepared from irradiated food items including maize, yam, cowpeas, fish, sweet potatoes, pork and chicken.

The fair was opened by the wife of the Head of State who was represented by the wife of the Vice-President of Ghana.

The Chairman for the opening ceremony was the Minister of Environment, Science and Technology. The Minister of Agriculture also delivered a speech.

The fair was well attended. There were reports on television, other electronic and print media. A video coverage of the event was prepared and a copy will be submitted to the ICGFI in due course.

Newspaper Articles

Apart from the food fair reports, there were two newspaper feature articles on Irradiation - one comparing Food Irradiation with the Traditional methods of food Preservation and the second, which appeared after the fair, highlighting on the benefits of the process in Food Preservation.

HUNGARY

In Hungary, the following three Institutions are working in the field of food irradiation technology:

1. AGROSTER Irrad. Inc.
2. Central Food Research Institute
3. University of Horticulture and Food Industry.

Commercial Food Irradiation

There is no change in the situation during the last 12 months because the quantity of commercially irradiated food and medical items are used only in the domestic market (max. 750 + 250 tons).

In June of 1998, we organized a press conference which had a very good result because more than 10 daily newspapers reported correct and good articles about food irradiation.

Last year, there was also a good opportunity for us to give information lectures in some public health conference/seminars about the benefit of food irradiation.

INDIA

- 1) **Regulations on Food Irradiation:** Application for approval of irradiated sea foods and pulses have been recommended by the Expert Group on Food Irradiation and placed for the consideration of National Monitoring Agency (NMA) constituted by the Government of India. The recommendation of the NMA will be placed for approval by the Central Committee for Food Standards (CCFS) which will then be notified in Gazette of India as Draft Rules.
- 2) **Authorized Applications of Food Irradiation:** The Ministry of Health and Family Welfare (Dept. of Health), Govt. of India have notified (Gazette Notification No. 112 dated 6.4.1998) the final rules permitting irradiation of additional food items listed in table below.

Commodity	Purpose	Dose, kGy	
		Minimum	Maximum
Rice	disinfestation	0.25	1.0
Semolina, Wheat atta and Maida	disinfestation	0.25	1.0
Mango	quarantine, disinfestation and shelf-life enhancement	0.25	0.75
Raisins, Figs and Dried Dates	disinfestation	0.25	0.75
Ginger, garlic and shallots	sprout inhibition	0.03	0.15
Meat and meat products including chicken	shelf-life enhancement and pathogen reduction	2.50	4.0

- 3) **Market trials** : Nil

4) **Trials** : Nil

5) **Status of commercial food irradiation:** A commercial prototype demonstration irradiation facility for the treatment of spices is in the final phase of construction in New Bombay under the management of Board of Radiation & Isotope Technology (BRIT) a constituent unit of Department of Atomic Energy (DAE). This facility has an initial throughput of 20 tons of spices per day.

BARC has designed a commercial prototype demonstration irradiator 'POTON' for the treatment of onions and potatoes. The first commercial demonstration facility with a throughput of 10 ton onions per hour is being set up in Lasalgaon, Nashik Dist., a major onion production and storage centre. The facility is expected to be commissioned in the next 20-22 months.

INDONESIA

1. **Regulations on Food Irradiation**

No amendments to existing regulation.

2. **Authorized Applications of Food Irradiation**

Indogamma has irradiated various food items in total of quantity from January - November 1998 as follows: dry products - 2,618,420 kg. and frozen products - 443,460 kg.

3. **Authorization of Food Irradiation Facilities**

No amendments to the facilities.

4. **Market Trial**

- Market trial on shelf-stable foods was successfully done in terms of quality after storage, and consumer acceptability of the products.

- Introduction of irradiated food at permissible dose to governmental sectors and army at national level is being done by giving presentations, selling the food and distributing questionnaire.

ISRAEL

1. Industrial Activities

The *Sor-Van* service irradiation facility continued decontamination of spices, condiments and herbs for the local food industry, expecting to reach a total throughput of about 1,100 tons by the end of 1998, and about 6,600 cubic meter of medical supplies. This indicates a 10% increase as compared to last year. The *Sor-Van* service irradiation facility holds the ISO-9002 certificate.

Preliminary assessment continues, at *Sor-Van*, of the technical and business aspects of commercial high-dose irradiation of ready-to-eat meals, comparing E-beam and Co-60 processes.

2. Contribution to ICGFI Programs

A US\$3,000 contribution pledge is negotiated for 1998, and at least a similar in-kind contribution via participation in ICGFI tasks.

ITALY

1. **Regulations and authorization on Food Irradiation**

The current regulation on radiation treatment of foodstuffs continues to be referred since 1973 to potatoes, onions, garlic and since 1996 to spices, herbs and condiments.

No new regulations were issued during 1998, so the list of Italian clearances in effect today is as follows:

- | | | |
|--------------------------------|--------------------------|--------------|
| • Potatoes, onions and garlic | sprout inhibition | 0.15 kGy max |
| • Spices, herbs and condiments | microbial load reduction | 10.0 kGy max |

According to regulations a specific label applied on product package must state the process features ("irradiated" or "treated by ionizing radiation"), the irradiation facility denomination and its exact location.

2. **Authorization of Food Irradiation Facilities**

None.

3. **Market trials**

None.

REPUBLIC OF KOREA

Current Status of Food Irradiation

A basic irradiation study in Korea was launched in 1959 with the facilities in Korea Atomic Energy Research Institute (KAERI, Co-60, 10,000 Ci). Thereafter, a large-scale gamma irradiation research facilities with 100,000 Ci (Co-60) began operation in 1975, application of irradiation techniques in medicine and pharmaceuticals, as well as in foods were introduced.

By this time, various sterilization techniques by gamma irradiation were under investigation internationally. And locally, studies on the application of this technique in the food industry were actively performed. Irradiation application studies for local industrialization began in 1980 by KAERI. As a result of this study, commercial irradiation facility, Greenpia Company, was built in Yaju, Kyong Ki province in 1987 and financed by the Agricultural Products Distribution Corporation.

Irradiation was originally planned for the prevention of germination of potatoes, onions, garlic and chestnuts and aging of mushrooms. But, the execution of this program experienced difficulties because of the need for additional storage facilities and distribution costs even though it would have resulted in savings of costs up to 300 times of conventional refrigeration.

The application of gamma irradiation was gradually expanded from foods to sanitary and medical products. In the 1990s, as the International Cancer Institute announced that ethylene oxide residue, a fumigant, in food and acts as a potent carcinogen, the Korean government prohibited the use of ethylene oxide in foods and the same measure was also recommended by WHO. As an alternative to ethylene oxide, the Ministry of Health and Welfare allowed the additional use of irradiation in raw materials for food processing.

In addition, international organizations including Codex, Food and Agricultural Organization, IAEA have permitted the use of irradiation in all food stuffs after reexamining its safety and effectiveness of its use when compared to other food preservation methods. This has allowed having a momentum in irradiation promoting the use of irradiation skills in food preservation in Korea.

The Korea Ministry of Health and Welfare (MOHW) is responsible for clearances and regulations of irradiated foods, MOHW consults with the Committee of Food Sanitation Deliberation and the Korea FDA. Korea Institute of Nuclear Safety, which is a government-funded organization under the Ministry of Science and Technology, inspects periodically the irradiator according to the Atomic Energy Law to ensure compliance with regulations.

The Presidential decree (No. 11, 717 of 29 June 1985) and MOHW decree (No. 767 of 1 July 1985) were a legal basis for newly established food irradiation business. The general standard and regulations for irradiation of foodstuffs were enforced in September 1987, and amended 19 May 1995.

The types of ionizing radiation used for food irradiation are gamma rays from the radionuclide, ^{60}Co . Regulations prohibit the re-irradiation of food under any circumstances. The irradiated foods should be packaged using a proper container or appropriate materials before going to market. The regulations also require that prepackaged irradiated foods should be labeled with the international symbol (above 5cm) for food irradiation. Gamma radiation from ^{60}Co source is authorized to use for food irradiation on 13 food groups as shown in Table 1.

However, those items granted irradiation were confined only to some health foods, basic condiments and raw materials for food processing. The use of irradiation did not affect much in stimulating food industry as a whole. In present Korea, irradiation is applied to foods which boiling or chemical sterilization is inapplicable and to some items requiring standards for HACCP system for export. Annual irradiation processing reaches around two thousand metric tons of food in Korea.

In addition, there will be a plan to apply authorization on the ionizing radiation of red meat and meat products.

Future Action

A number of important public health benefits can be realized by irradiation of food. However, a commercially successful food irradiation program must be based on sound economics with serious consideration being given to both the general business requirement and the appropriate irradiation technology in order to obtain affordable cost and profitability. In addition to irradiation itself, other factors must be considered for successful implementation. These factors include the development of a necessary infrastructure for transport and the storage and distribution of food, which are of considerable importance to the country.

In order to heighten the commercial irradiation for food, we are urged to issue broader regulations for the proposed use of these foods based on the principles of the Codex General Standard for Irradiated Food and on current research findings. In addition to the fact that most fumigants have been eliminated because of health or environmental reasons, we have found that economic analysis, consumer surveys and organoleptic tests have indicated a clear advantage for the use of irradiation. Therefore, practical data related to the commercialization of food irradiation technology are very important from the standpoint of government, industry, trade, and consumers. The guidelines issued by international organizations are more effective than the domestic point of view for persuasive power in promoting food irradiation.

Taken as a whole, the most critical impediment to the commercial application of food irradiation has been the general consumers' low acceptance. However, the positive attitude toward irradiated foods was easily found among the consumers when they understood the safety and advantages of this technology. In this respect, further efforts have been required to educate the consumers with valid information on the beneficial aspects of food irradiation compared with conventional methods. The Korean government and most of the food industries have recognized the benefits and advantages of irradiation processing over the existing conventional methods. The most important task in food irradiation could be overcome consumers' psychological resistance and transportation matters of the products to be irradiated. A certain Korean company has contracted establishment of new multipurpose commercial irradiator. All the successful commercialization of food irradiation has been associated with the careful provision of well thought-out information for the consumers. There are certain essential elements that need to be included if the information of why irradiation is being used and what it is doing to particular food. Also, the key to the acceptance of irradiated food lies in having high quality products readily available for the consumers to try.

Consignment researches are on going by Korea University, Kyungbuk National University and Hallym University on detection method for irradiated foods, evaluation of wholesomeness and survey on quarantine of imported foods and consumer acceptance and test marketing on the irradiated food was surveyed by Gallop Korea, an agent of a survey of public opinion, under supervision of KAERI.

FAO/IAEA (RCA)/ICGFI Workshop on Harmonization of Procedures and Regulations on Food Irradiation for Asia and the Pacific was held in Seoul, Republic of Korea (27-29 APRIL 1998). The Meeting decided to take the ASEAN draft harmonized regulation as a basis for its deliberations. And, national seminar on "the Acceptance and Trading on Irradiated Foods" was held in Korea University (30 Apr. 1998) collaborated with Korean Society of Food Science & Technology, Korea Atomic Energy Culture Foundation and KAERI.

Table. List of authorized applications of food irradiation for human consumption in Korea

Product	Type of clearance	Dose permitted	Date of approval	Note
Potato, onion, garlic	unconditional	0.15 max.	16 Oct. 1987	
Chestnut	unconditional	0.25 max.	16 Oct. 1987	
Fresh mushrooms	unconditional	1.00 max	16 Oct. 1987	
Dried mushrooms	unconditional	1.00 max.	16 Oct. 1987	
Dried meats, powdered-fish and shellfish	unconditional	7.00 max.	14 Dec. 1991	Only for the processing food
Soybean paste powder, hot pepper powder, soybean sauce powder	unconditional	7.00 max.	14 Dec. 1991	
Starch	unconditional	5.00 max.	14 Dec. 1991	Only for the processing food
Dried spices and their preparations	unconditional	10.00 max.	19 May 1995	
Dried vegetables	unconditional	7.00 max.	19 May 1995	Only for the processing food
Yeast and enzyme foods	unconditional	7.00 max.	19 May 1995	
Powdered aloe	unconditional	7.00 max.	19 May 1995	
Ginseng products including red ginseng	unconditional	7.00 max.	19 May 1995	
Second sterile meals for patient	unconditional	10.00 max.	19 May 1995	

Table. Annual Irradiated Quantity of Foods in Korea

Food Items	Quantity of Irradiated Foods(ton)			
	1994	1995	1996	1997
Mushrooms (fresh & dried)	100	60	150	160
Spice & their preparations	500	600	750	900
Dried meats	50	20	30	35
Dried fish & shellfish powders	200	150	160	170
Soybean paste powder	100	70	30	50
Hot pepper paste powder	0	0	75	65
Soybean sauce powder	70	60	65	70
Starch for condiments	70	60	63	70
Dried vegetables	0	300	400	500
Yeast & Enzyme products	0	5	7	10
Aloe products	0	7	15	10
Ginseng products	0	0	5	5
Total	1,090	1,332	1,750	2,045

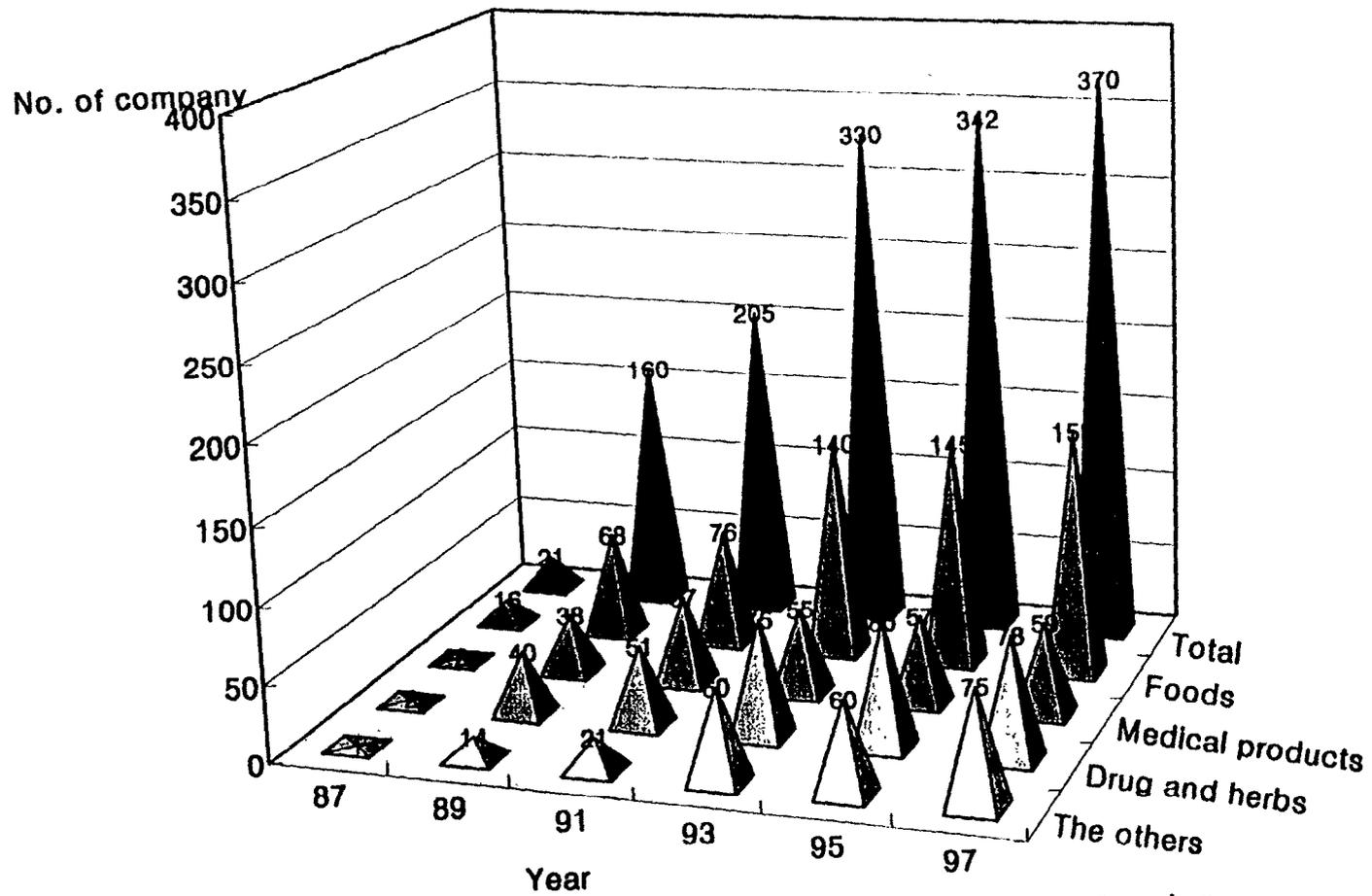


Fig. The number of business enterprises commercially using γ -ray facility in Korea.

MEXICO

1.- Regulation on Food Irradiation

During this year, the "Reglamento General de Salud en Materia de Control Sanitario de Establecimientos, Actividades, Productos y Servicios" was reviewed. In this document is written the twenty third title which correspond to Food Irradiation. The main comments presented by the food industry to this official document were:

- 1) Change the maximum dose limit, because until now 10 kGy is the maximum radiation dose authorized, and the industry argued that for some products it is necessary to use higher radiation dose.
- 2) Labeling a whole irradiated product. Labeling when one of the irradiated ingredients is used in the maximum rate, but the industry did not agree in labeling when one of the irradiated ingredients is used in a minimum quantity.

The official authorities did not accept these proposals; for the first one, the authority decided to follow the maximum doses authorized by Codex Alimentarius, and for the second point, the authorities' position is that it is necessary to label and to write the phrase "irradiated product" even if only an ingredient is used in minimum quantity because consumers have all the right to know what kind of food they select for eating. An additional and very important point is that the consumers become used to this process and they gradually acquire irradiated food for their daily diet.

2.- Authorized Applications of Food Irradiation.

There are two Co-60 gamma irradiation facilities to treat food; one belongs to the Instituto Nacional de Investigaciones Nucleares (ININ) located on km 37 road Mexico - Toluca. It is a multipurpose plant - this facility was built by Nordion International Inc., the model of the facility is JS-6500. This facility had been irradiating dried food since 1986. In that year 300 tons from 6 companies. Through the years the quantity of the products and type, and the number of the companies have been increasing year by year. In the last year the quantity of irradiated dried food reached 4000 tons, giving service to 92 food companies. The principal items are: dried herb, condiments, seasonings, dried fruits and vegetables, like lettuce, nopal, sandia and different species of chiles in different presentations. In August of this year this facility was reloaded with 120,000 Ci and the activity now is 570,000 Ci.

The second one is a pilot facility. It is located at the Instituto de Ciencias Nucleares at the Universidad Nacional Autónoma de México, (UNAM). This facility was also constructed by Nordion International Inc. and the model is a Gamma beam 651 pt. At the beginning this facility was built for research studies, but now it also gives service to food companies. In the last year this facility irradiated nearly 600 tons of different kinds of dried food. This facility was also reloaded and the activity up to know is 62,000 Ci.

3.- Authorization of Food Irradiation Facilities

The company named NGS Enterprises has done a whole study to built a Co-60 gamma rays facility, in the industrial city of Tepeji del Rio, in the Hidalgo State. The company has given the information corresponding to the several authorities involved in the construction, installation and operation of the irradiation plant: Comisión Nacional de Seguridad Nuclear y Salvaguardias (Safeguards), Government of Hidalgo state and the Instituto Nacional de Ecología, with the purpose of getting the authorization to start the construction. By informal communication the idea is to start with the construction next year and the plan is to start with an activity source of 1,000,000 Ci. This project is a joint venture between Grifit Micro Science, and Nordion International Inc. companies.

4.- Market Trials.

None.

5.- Trials

There are at least three companies interested in the application of the irradiation process to commercial level, mainly for fresh fruit disinfestation, so they have been doing their economic feasibility studies by themselves.

6.- Other Information

6.1.- Promotional Activities

ININ is carrying out a constant work of promotion in order for a greater group of people to know the applications of irradiation. This promotion is carried out through videos, oral presentations or by written information and this information are presented and offered to all levels in the academe, managers, industry, officials and so on.

6.2.- Meeting Mexico - United States

On October 1st and 2nd, a Meeting was held related the use of irradiation as a quarantine treatment". The meeting was attended by 20 Official representatives, from the government of the United States, one from Canada and from Mexico, and participants from the Secretaria de Salud, Sanidad Vegetal, Comision Nacional de Seguridad Nuclear y Salvaguadías, ININ, private associations and private companies. The main objective was to explore the feasibility of the technology as a phytosanitary treatment for fresh fruits and vegetables between the two countries, after a considerable discussion of the mechanics of the irradiation process and its applicability to fresh fruits and vegetables, and knowing the advances that each country has for the application of this technology, in order to continue with the development of this work. The United States will send the final version of the document "USDA standards and General requirements for the use of irradiation to mitigate pests of plants" and Mexico will prepare the proposal for technical standard for the application of irradiation as a phytosanitary treatment, because until now, the irradiation treatment is not officially recognized by the phytosanitary authorities.

MOROCCO

I. Introduction

It has always been a true concern of a human being to improve his life. This task has taken a greater scale with the demographic explosion, since the issue of food resources has become more accurate.

Actually, the challenge to face is not only to produce more quantities of food but also to improve conditions of storage and transport. Nuclear technique is one of the greatest means available to mankind to bring solutions to these problems.

In Morocco, the climatic conditions which are particularly suitable to the food products alterations and the lack of storage facilities are the basic reasons for the considerable losses in production (almost 27%).

For these reasons, different preservation techniques are used such as fumigation, chilling, canning, etc. But these techniques have limited results and some are so much expensive. In this context, the INRA has installed a pilot unit with maximum capacity of 100.000 Ci with 3 exposition systems. The actual capacity is about 10.000 Ci.

II. Legislation

Three texts have been promulgated relative to the creation of the National Council of Nuclear Energy, radioprotection and the authorization and supervision of the nuclear installation.

The first draft of the legislative text relative to food irradiation, which has been prepared by the Director of Plant Protection, Technical Control and Fraud Repression is being modified according to the workshop recommendations held in Ghana to harmonize it with other African countries.

Actually, the trade of irradiated products is not legislated but an additional clause is forecasted in the food irradiation text.

The institutions charged for the control and the enforcement of the different legislation texts are the Fraud Repression Service, the National Radioprotection Center and the Sanitary Institute.

III. Technology Transfer

Right now, we cannot transfer the irradiation technology to industry because of the low capacity of the source but some actions could be considered as technology transfer.

As part of the programming by objective which I organized for the most interesting research programs in Morocco and the interest showed by the government to promote the irradiation technique, it was decided to organize several meetings to decide on the priorities of the different research operations led by the nuclear techniques program. This program has four projects and now the priority is given to the food irradiation one. For this project, the priority was given for the irradiation of cereals, pulses, citrus, fruits, vegetables and different types of meat.

Many departments are involved in this program like the National Center of Nuclear Studies (CNESTEN), the Direction of Plant Protection, Technical Control and Fraud Repression, the University of Tetouan and Kenitra, the Agronomic Institute and other research institutes.

Also some negotiations with some private sectors to treat some product as dried medicinal plants, tomato powder and mushrooms at semi-industrial scale are in progress.

NEW ZEALAND

1. Regulations on Food

Under Regulation 264 of the Food Regulations 1984, the sale of irradiated food is prohibited unless the Minister of Health has approved the specific treatment.

2. Authorised Applications of Food Irradiation

None in 1997/98

3. Establishment of Food Irradiation Facilities

None

4. Market Trials

None

5. Experimental Trials

None

6. Other

The government's policy on food irradiation remains as announced in December 1988. That is, the production, sale, export and import of irradiated food should not be permitted. However, the use of ethylene oxide treatment remains under scrutiny, and it is intended to phase out the use of this treatment as soon as practical. Alternative methods, including irradiation, are under consideration for those spices for which it is difficult to guarantee satisfactory microbial standards without the use of a physical/chemical decontamination treatment.

There is an agreement between New Zealand and Australia on the setting of joint food standards. Australia has previously proposed a standard on food irradiation (see Australian Country Statement for 1996). The Australia New Zealand Food Authority will soon undertake public consultation in New Zealand on a draft joint standard for New Zealand and Australia.

PAKISTAN

1. Introduction

Pakistan, like other developing countries, is facing the problem of shortage of food commodities, high post-harvest food losses, and food spoilage. Pakistan is producing abundant quantities of cereals, pulses, vegetables, fruits, meat, fish, and other food materials. To save these commodities from high post-harvest losses and to preserve perishable commodities, Pakistan has conducted R&D on conservation of food materials using gamma irradiation.

2. Pilot Scale Irradiation and Commercial Trials

The commercial trials for irradiation of potatoes, garlic and onions irradiated at 0.1% kGy has already been conducted. The potatoes were put on sale when local prices were high and the untreated tubers showed medium size sprouts. The irradiated product was sold on special counter with the irradiation sign. The consumers showed considerable interest. A questionnaire circulated simultaneously showed that consumers were willing to accept irradiated food.

Some food industries had requested for application of irradiation technology for control of infestation and maintaining good quality of their products such as porridge food.

3. Regulations on Food Irradiation

Regulations on Food Irradiation, covering all the seven classes of foods, have been approved by the Government of Pakistan and published in the Gazette Notification in March 1996.

PHILIPPINES

1. Regulations on Food Irradiation

The Bureau of Food and Drugs, in cooperation with the Philippine Nuclear Research Institute has drafted an administrative order prescribing the regulations for food irradiation. These regulations are based on international standards and patterned after the model harmonized regulations on food irradiation for Asia and the Pacific. It is planned that these regulations will be finalized in early 1999.

2 Authorized Applications of Food Irradiation

Some spice manufacturers were issued temporary clearance by the Bureau of Food and Drugs (BFAD) to use gamma radiation for the microbial decontamination of spices at a dose of 6.0 kGy. The BFAD also allowed Food Development Center to test market irradiated multiplier onions in cooperation with a private industry.

3. Authorization of Food Irradiation Facilities

There is no authorized commercial food irradiation facility in the country. To date, the PNRI has a multipurpose pilot scale facility with 120 kCi Co-60 which is used for pilot and semi-commercial irradiation of food.

QUANTITY AND TYPE OF FOOD IRRADIATED FOR SEMI-COMMERCIAL PURPOSES

ITEMS	DOSE (kGy)	WEIGHT (ton)	PURPOSE
1. Onion powder	6.0	33.8	decontamination
2. Garlic powder	6.0	0.9	-do-
3. Cayene powder	9.0	4.8	-do-
4. Other spices & Deh. Vegetables	3.0	0.4	-do-
5. Bread crumbs	3.0	0.6	-do-
6. Animal feeds	6.0	2.0	-do-
7. Multiplier onions	0.05	14.0	market testing

4. Market Trials

Eighty (80) tons of onions (red creole & yellow grannex) irradiated in April and May 1997 were test marketed in December 1997. In April 1998, fourteen (14) tons of multiplier

5. **Public Information**

1. Food Irradiation/Nuclear Awareness Seminar

Two food irradiation seminar were held; one in San Francisco High School, Bulacan, before 600 High School students and another at St. Paul's Colleges, Pampanga before 500 students.

2. Symposia/ Workshop

Presented a paper on "Post harvest Storage Evaluation of Irradiated Rice & Corn", during the plenary session on the 10th National Rice Research & Development Review & Planning Workshop at the Phil. Rice Research Institute, Munoz, Nueva Ecija.

3. Exhibits

Participated in the following technical exhibits:

1. Science & Technology Fair, Manila
2. Regional Science Fair, Baguio City
3. Science Fair, St. Paul's Colleges, Pampanga

4. Radio Interview

Three radio interviews on food irradiation was held during this period.

5. Brochures

Approximately, five thousand copies of a one-sheet brochure on food irradiation were distributed during this period.

POLAND

Statement

Poland is interested in further co-operation during the forthcoming period of 3-5 years with ICGFI after extension of its mandate, or with a new IAEA/WHO/FAO organisation of a similar profile. This statement has been officially submitted to the Agency.

Regulations

It is expected that in the nearest future the permission for radiation preservation of medical herbs and preparations with the doses 5 - 10 kGy will be issued by the Ministry of Health and Social Care. Poland is one of important producers of these products in Europe. The need for microbial decontamination by radiation treatment of herbs and medical preparations is now well understood and accepted in the country.

Commercial activity

The throughput of INCT Plant for Food Irradiation during the last year was about 400 tons. Spices, dried mushrooms and vegetables were irradiated.

Irradiation Facilities

In the period of 1996-98 the national programme on the development of radiation preservation of medical herbs and preparations was executed. In the programme several scientific institutes as well as „Herbapol” the producer of phitopreparation and medical herbs in Poland were involved.

Resulting from growing interest in application of nuclear and radiation methods in the country, the National Atomic Energy Agency initiated the creation of Governmental Strategic Programme „Isotopes and Accelerators”.

In frame of this programme current efforts are focused on the new generation of purpose addressed accelerators. One of most important applications is the treatment of food commodities with accelerated electrons or high energy X-ray photon beams.

Two types of accelerators are in advanced designing process:

10 MeV, 20 kW linear S-band accelerator fed from high duty-cycle klystron. The machine is conceived as a compact unit easily adaptable to any irradiation facility and suitable for medium scale throughput requirements.

10 MeV, 20 - 50 kW modular resonant accelerator operating in 300 MHz frequency band. Designated for high throughput treatment; due to its modular construction can be upgraded if necessary towards higher beam power.

The INCT Plant for Food Irradiation in Warsaw and several other facilities in Poland are foreseen for the installation of such machines.

Contribution to ICGFI

The sum of 5.000 USD has been transmitted from Poland to ICGFI in 1998.

PORTUGAL

1. Regulations in food Irradiation

There are no regulations on Food Irradiation in Portugal, which means, following the law in force, it is not forbidden to irradiate foods in this country. However, it is not advisable to take the initiative to irradiate food unless a support of the competent authorities is obtained which far to be the case.

The approval of the European Union (EU) Directive could change this situation. Regulations on labeling of food products, including the labeling of food irradiation products, have been published in 1993.

Five CEN Standards on analytical methods to detect irradiated food are in force in EU since 1996.

2. Authorized Applications of Food Irradiation

None

3. Authorization of Food Irradiation Facilities

None.

4. Market Trials

None.

5. Trials

None

6. Other Information

Research and Development

Scientific work in the field of food irradiation processing and detection of irradiated food (spices, dried fruits and potatoes) involving National Institutes (INIA, INETI, ITN) and Universities of Lisbon area has continued. INIA and ITN also have research contracts with IAEA in Radiation Processing of Food.

Publications in specialized Journals have been published or are *in press*.

During the year of 1998, a Ph.D. student has discussed her dissertation thesis at the Technical University of Lisbon and has obtained a doctorate in Food Irradiation; other Ph.D. student has started his experimental work.

SOUTH AFRICA

1. Regulations on Food Irradiation

The Department of Health with the assistance of the Working Group on Food Irradiation developed draft regulations to amend the present regulations. The draft regulations are based on the Codex Alimentarius principles and the African model for Regulations on Irradiated Food. These were submitted for legal opinion in the beginning of May 1997, but have not been approved yet.

The Department of Health already permits the sale of meat irradiated at doses of more than 10 kGy under specific conditions. The draft Regulations make provision for high dose applications.

2. Authorized Applications of Food Irradiation

No new authorizations

3. Authorization of Food Irradiation Facilities

No new authorizations

4. Market Trials

None

5. Trials

None

6. Other Information

In future the information on products and quantities of products irradiated in South Africa will be reported according to the different food classes and not according to individual products.

ANNUAL REPORT ON AMOUNTS (TONS) OF FOODSTUFFS IRRADIATED
COMMERCIALY IN THE REPUBLIC OF SOUTH AFRICA

PRODUCT	1996	1997
Cereal	14.5	31.0
Chicken breast meat	0.0	2.4
Dehydrated vegetables	30.4	26.0
Desiccated coconut	0.0	12.0
Dried fruit	0.8	1.5
Egg products	42.3	195.0
Garlic	386.0	521.0
Health preparations	3.0	17.9
Hog casings	0.0	0.7
Honey products	2 100.0	403.5
Royal Jelly	1.0	1.9
Shelf-stable foods	5.0	9.3
Spices and herbs	8 772.0	11 334.0
Torulite yeast	43.0	66.0
TOTAL	11 470.1	12 622.2

SYRIA

1. Introduction

A food irradiation program in Syria has been on-going for more than 17 years. The major goal of this program has been to investigate the effects of ionizing radiation on storability and hygiene of food and to use irradiation as a new method in application field. Other objectives of the program were to determine the legislation and clearance of food irradiation.

2. Food Irradiation Legislation and Clearance

In Syria, the Atomic Energy Commission (AECS), is the only agency in the country that regulates the food irradiation process and extends their proposals to aspects which have no direct relation with the food to be treated. Technical aspects such as radiation protection, process control, dosimetry, etc. are of interest.

Recently, irradiation of food has got a clearance.

- Decision 119 dated 2 Aug. 1986. Syrian National Standard no. 402. Irradiated food for human consumption with dose up to 10 kGy according to the Codex General Standard for Irradiated Foods (translated from English to Arabic).
- Decision 145 dated 10 Sept. 1986. Syrian National Standard no. 403. Code of Practice for operation of radiation facilities used for the treatment of food, according to the recommended international Code of Practice for operation of radiation facilities used for the treatment of foods, (translated from English to Arabic). The two decisions were in agreement with the Committees from the Ministry of Supply and Internal Trade, AECS and Syrian national standards.

3. Social Feasibility for Food Irradiation

No studies or tests have ever been conducted in Syria to assess the acceptance or refusal of the irradiated foodstuffs. This is attributed to the unavailability of the concerned foodstuffs in the markets thus there is no need to make such tests.

Local newspapers quote the subject concerning food irradiation from international bulletins and publications such as those from FAO and IAEA, i.e. positive in general. However, when thinking to generalize this technique, there must be advertisements by the authorities by writing articles in the local newspapers and making interviews to emphasize the technical feasibility and benefits that could be achieved when applying this technique.

We think that irradiation of food may provide some social benefits, among them are:

- Availability of food throughout the year with good quality and stability of prices consequently protecting consumers from price fluctuations.
- Minimize losses resulting in traditional storage methods.
- Provide additional work chances by increasing the shifts and operation time of the food industry factory.

To educate consumers, we used the following:

- Training course on the sterilization and preservation of food by irradiation. This TC was jointly organized by the Arab Atomic Energy Agency (AAEA) and the Syrian Atomic Energy Commission (AECS) in Damascus for the period 24-29 October 1994. Nineteen participants were from Syria.
- Seminar about irradiated and contaminated food by irradiation. This seminar was jointly organized by the Ministry of Supply and Internal Trade and the AECS in Damascus on 3-4 June 1995 with 175 participants attending.
- The third Arab Conference on the peaceful uses of atomic energy organized by AAEC and AECS in Damascus, 9-13 December 1996. One session was held on Food Irradiation.
- Workshop on Identification of Irradiated Food. This workshop was jointly organized by AAEA and AECS in Damascus, 16-17 December 1997. Seventeen participants came from Syria.
- Workshop on Economic Feasibility Study on Food Irradiation. This workshop was jointly organized by FAO and the AECS in Damascus, 16-19 October 1997. Twenty-two participants were from Syria.

In addition, we have interviews on the subject and published some articles in local and regional newspapers and magazines.

THAILAND

Introduction

The application of gamma irradiation has been used to establish the efficacy of irradiation process for the preservation of food and agricultural products at pilot and semi - pilot scales. Many commodities, food and agricultural products, such as onions, garlic, mango, papaya, banana, strawberries, frozen shrimps, poultry, rice, mungbean, dried fish etc. have been found technically feasible for preservation by irradiation. Shipping trials of some selected irradiated commodities have also been conducted under various collaborated programs.

Status of Irradiated Food in Thailand

1. Regulations of Food Irradiation

Food irradiation in Thailand has been controlled under the National Regulation on Food Irradiation, issued by the Food and Drug Administration (FDA), Ministry of Public Health, since 1986, based on the Codex Alimentarius Standard. Under this regulation, approval has been granted for the treatment of 18 food items for different purposes and dose rates.

In addition, guidelines on Good Manufacturing Practices of Irradiated Food has also been established by Thai FDA and approved by the Food Committee for the control of food irradiation process in Thailand.

2. Authorization of Food Irradiation Facilities

Gammabeam - 650 with an initial load of 50 KCi has been the only facility used for Food irradiation activities in Thailand since 1971 at the Office of Atomic Energy for Peace (OAEP). In 1989, the OAEP in cooperation with the Canadian International Development Agency (CIDA), has completed the initial load of Co - 60, 450 KCi as demonstration and research facilities. Research and development activities in the field of food irradiation are continuing extensively.

3. Present Commercial Irradiation of Foods

Irradiated fermented pork sausages (Nham) has been conducted for domestic consumption regularly. Spices were also irradiated for soups and other purposes. Small quantity of other food and agricultural products are also irradiated for market trial, i.e. tamarind for shelf - life extension rice grain and wheat flour for insect disinfestation.

4. Experimental Trials

The application of gamma irradiation has been used to establish the efficacy of irradiation process for preservation of food and agricultural products at pilot and semi - pilot scales. Currently, food irradiation R & D on some selected fish and fishery products, spices, cereal grains, fruits and other agricultural products are in progress.

In addition, insect disingestation of agricultural produce and products by radiation as a quarantine treatment is also being conducted actively in the laboratory and at a semi - pilot scale.

5. Technology Transfer

Technology transfer has been extensively carried out to provide information on food irradiation to the public, governmental institutions and private companies working on the production, storage and trade of fruits, vegetables, cereals, poultry and seafood. Training courses on food irradiation process, technical managers of irradiation facilities and also for food inspectors as well as seminars and workshops were held at Thai Irradiation Center (TIC) and OAEP with the cooperation of FDA and the Department of Agriculture occasionally. Open houses for industry, the press and public are still continuing. The results show positive responses.

USDA/APHIS

“Irradiation Phytosanitary Treatment of Imported Fresh Fruits and Vegetables” --- January 1999.

This proposed regulation will discuss various irradiation issues and how they must be integrated to achieve effective irradiation treatments, and then proposes specific standards for an irradiation treatment for fruit flies in fresh fruits and vegetables.

American Society for Testing and Materials (ASTM)

1. Development of Dosimetry Standards --

The United States Department of Agriculture (USDA) and the US Food and Drug Administration (FDA) have continued to support the development of dosimetry standards for use in food irradiation under the auspices of the American Society for Testing and Materials (ASTM). With the recent completion and publication of two new standards: a *Guide for Dosimetry for Irradiation of Insects for Sterile Release Programs* and a *Practice for Application of Thermoluminescence Dosimetry (TLD) for Radiation Processing*, a total of twenty-four dosimetry standards have been completed and approved, and are published in Volume 12.02 of the *1998 Annual Book of ASTM Standards*.

Of the 24 dosimetry standards, three are specifically for food irradiation applications, but the majority apply to all forms of gamma, x-ray, and electron beam radiation processing, including dosimetry for sterilization of health care products and the radiation processing of fruits, vegetables, meats, spices, processed foods, plastics, inks, medical wastes and paper. Most of the standards provide exact procedures for using individual dosimetry systems or for characterizing various types of irradiation facilities, but one covers the selection and calibration of dosimetry systems, and another covers the treatment of uncertainties using the new ISO Type A and Type B evaluations. Other standards include a *Guide for Dosimetry in Radiation Research on Food and Agricultural Products*.

ASTM Subcommittee E10.01 is now in the process of developing several new radiation dosimetry standards connected with food and agriculture, including: a *Practice for Dosimetry for a Self-Contained Dry Storage Irradiator* (now being balloted), and a *Practice for Dosimetry in Radiation Processing of Fluidized Beds and Fluid Streams* (outline completed - this standard is applicable to grain irradiation). These standards, along with 6 others being developed, will cover essentially the whole field of dosimetry for radiation processing.

As a separate action, twenty of the 24 completed standards are presently undergoing their final level of balloting by ISO Technical Committee 85. It is expected that these standards will become ISO standards before the end of 1998.

For additional information about participation in this standards development program, contact the Chairman of ASTM Committee E-10, Dr. Harry Farrar IV, 18 Flintlock Lane, Bell Canyon, CA 91307, USA (phone: 1-818-340-1227; fax: 1-818-340-2132; e-mail: hfarrar4@aol.com). To purchase copies of completed standards, contact Customer Service Department, ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 USA (phone: 1-610-832-9585; fax: 1-610-832-9555; e-mail: service@astm.org).

2. Development of Food Irradiation Standards

ASTM Subcommittee F02.40 on Food Processing and Packaging is developing standard guides providing information on "good irradiation practice" for many foods. Most of the standard guides are based on "Codes of Good Irradiation Practice" produced by the International Consultative Group on Food Irradiation (ICGFI). About ten years ago, people involved with ICGFI and with ASTM decided that it would be useful to have those codes converted to ASTM documents because doing so would give users broader access to them. The subcommittee is updating the information and presenting it in a more user-friendly style.

Five guides are complete and the first four are published in Volume 15.09 of the *1998 Annual Book of ASTM Standards*. F1885 is now available as a reprint from ASTM and will appear in the *1999 Annual Book of ASTM Standards*

F1355 - Standard Guide for the Irradiation of Fresh Fruits for Insect Disinfestation as a Quarantine Treatment

F1356 - Standard Guide for the Irradiation of Fresh and Frozen Red Meats and Poultry (to Control Pathogens)

F1640 - Standard Guide for Packaging Materials for Foods to be Irradiated

F1736 - Standard Guide for Irradiation of Finfish and Shellfish to Control Pathogens and Spoilage Microorganisms

F1885 - Standard Guide for Irradiation of Dried Spices, Herbs, and Vegetable Seasonings to Control Pathogens and Other Microorganisms

Currently, the Subcommittee is working to revise and update Standard Guides F1355 and F1356 as required by ASTM at five-year intervals. Areas of new standards development will be based on perceived needs of the food processing industry. Two areas of current interest are irradiation for microbial control in fresh produce, and irradiation of animal feeds to reduce the incidence of pathogens that may carry over into foods. The subcommittee has not begun developing these standards because they have not yet found experts in the fields of processing these commodities. It is important to get input from those actually involved in those industries to assure that the resulting guides will include complete and correct technical information and be written in language that is familiar to potential users.

The subcommittee, which meets semi-annually at locations within the continental United States, encourages participation from interested parties in the development of its standards. Also, the subcommittee is ready to participate with other organizations who have interests similar to theirs. For additional information, contact the Subcommittee Chairman, Don Derr, 148 Alview Terrace, Glen Burnie, MD 21060-7452, USA (phone: 1-410- 766-9186; fax: 1-410-766-0540; e-mail: ddderr@erols.com). To purchase copies of completed standards, contact Customer Service Department, ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 USA (phone: 1-610-832-9585; fax: 1-610-832-9555; e-mail: service@astm.org).

FDA Activities on Food Irradiation - 1998

FDA personnel participated in several significant meetings and amended its regulation for labeling of irradiated food to clarify type size requirements, as set out in the Food and Drug Administration Modernization Act of 1997 (FDAMA). The specific details are given below:

1. On February 4, 1998, FDA spoke at the Toxicology Forum Winter meeting in Washington, DC, concerning its December 1997 approval of irradiated meat and the new irradiated food labeling provision in FDAMA.
2. On February 11-13, 1998, FDA spoke at a seminar on meat irradiation in Chicago, IL, sponsored by the American Meat Institute and the National Center for Food Safety and Technology. Topics discussed were the 1997 approval of meat, labeling, and packaging materials that would be subject to the irradiation.
3. On February 18-19, 1998, FDA participated in the Public Voice Roundtable on Food Irradiation in Washington, DC. The meeting brought together representatives from industry, consumer groups, and government to share views and promote common understanding.
4. FDA also participated during the Spring in a meeting on Food Irradiation sponsored by the Science and Public Policy Institute, the Grocery Manufacturers Association, the Food Marketing Institute, and the American Farm Bureau Federation.

Department of Defense (DoD) Activities – Army Natick Research, Development and Engineering Center, Natick, Massachusetts

The DoD, through its Army Natick RD&E Center (Natick), continues to focus on increasing the variety of high dose irradiated products and on facilitating the regulatory approval of such products and related packaging.

Natick, in support of the need that astronauts have for shelf stable whole meat products, has provided NASA with over 3,000 pouches of grilled beefsteaks, sliced turkey, and other

developmental items such as corned beef slices, spicy chicken, and pork sausage. Among the newer items being developed are beef fajitas and beef enchiladas. All of these were prepared and processed in accordance with accepted practices, and they consistently receive high acceptance ratings.

Natick, in collaboration with Biogam of South Africa, continues to assess the consumer acceptance of high dose irradiated products. Approximately 1,000 samples of roast chicken, roast beef, and steak with tomato have been produced for a field test in which these will be compared against closely related thermoprocessed counterparts.

Natick, in collaboration with the Chemical Methods Branch of the FDA, investigated the volatile hydrocarbons formed from the lipids in ten different products prepared by Biogam and processed over a carefully controlled range of dose. The results, given in terms of the amount of a particular hydrocarbon formed as a function of dose normalized for the amount of precursor fatty acid in the lipid, show a clear consistency in the chemistry. Accordingly, hydrocarbons such as pentadecane, hexadecatriene, heptadecane, and heptadecadiene all show similar responses irrespective of the nature of the product, which further supports the chemiclearance principle.

Natick has also been extensively involved in coordinating and editing the report of the Joint IAEA/FAO/WHO Study Group on High Dose Irradiation, which concluded that foods irradiated to any practical dose sufficient to achieve the technical objective are safe to consume and nutritionally adequate. The Report contains the relevant data upon which the Study Group based its general conclusions and recommendations as well as its specific conclusions relating to different aspects of their assessment, including nutritional, microbiological, and toxicological.

Because of the important role that packaging plays in protecting the irradiated foods, Natick is involved in a collaboration with several institutions on assessing the suitability of different generic polymers for their safe and effective use in irradiation processing. The principle underlying this assessment is that the resistance to radiation-related changes in the polymer is linked to its chemical composition and structure. It is the intent of this collaboration to provide a basis for selecting the most suitable polymeric packaging from currently available materials and for demonstrating their safety.

U.S. Codex Office

The 7th Quadilateral Discussions on Food Safety, involving the U.S., Australia, Canada and New Zealand was held September 2-3, 1998 in Balitmore. Codex topics dominated the discussions. The four countries are seeking common positions. On September 3, the group discussed the potential role of the countries in a proposed revision of codex standards on irradiation of foods and labeling of foods and ingredients that have been irradiated.

On September 21, 1998 members of the U.S. Delegation to ICGFI met with U.S. Codex Staff to discuss the "high dose irradiation for sterilized product" and "labeling" issues of food irradiation. The discussion focused on steps to amend the labeling provisions of the Codex General Standard for the Labeling of Prepackaged Foods and to amend the Codex General Standard to allow doses greater than 10 kGy as the recommended upper level.

SPS Committee

At the 12th Meeting of the SPS Committee in Geneva, 15-15 September, 1998, the U.S. indicated that it had submitted official comments to the E.C. (G/SPS/N/EEC/61 -E.C.- Food Treated With Irradiation) on the notification and encouraged the E.C. to expand the list of qualified foodstuffs, to include pork, beef, poultry, and fresh fruits and vegetables. The U.S. delegate noted the growing importance of irradiation as a tool for quarantine treatment to prevent introduction of plant pests, and that such treatments were essential with the desirability for the phase-out of the use of methyl bromide.

Miscellaneous Items

a. Conferences and Seminars in 1998

1. "Identifying, Addressing and Overcoming Consumer Concerns" A Roundtable on Food Irradiation was held February 18-19, 1998 in Washington. The Roundtable was convened by Public Voice for Food and Health Policy, National Food Processors Association and the International Food Information Council.
2. A "Seminar on Irradiation: Fact and Fiction" was sponsored by the American Meat Institute foundation and the National Center for Food Safety Technology, February 11-12, 1998 in Chicago, Illinois.
3. The "21st National Food Policy Conference" was held March 23-24, 1998 at the National Press Club in Washington, D.C. "The Right Food Safety Technology", including Irradiation was a topic.
4. Meeting Between the U.S. Department of Agriculture (USDA)/Animal and Plant Health Inspection Service (APHIS) and the Irradiation Industry.

This meeting was held in Yorba Linda, California on 11-14 May 1998 in order to finalize the APHIS draft document on "USDA Standards and General Requirements for the Use of Irradiation as a Phytosanitary Treatment". This document will be formalized in January, 1999, as an informational APHIS document. It is not a document of legally enforceable regulatory requirements for conducting irradiation treatments, or moving articles treated by irradiation. Instead, it repeats certain requirements established in different APHIS regulations in the CFR; it describes

actions that APHIS employees will take at ports, irradiation facilities, and elsewhere, to enforce those regulations; and it describes a number of "safe harbors" or "best practices" that are known to be ways to comply with the regulatory requirements. A draft copy is available as a room document for review and comment.

5. Meeting Between the United States and Mexico on the Use of Irradiation as a Phytosanitary Treatment, 1-2 October 1998.

Recognizing the continued demands on global trade and the imminent world-wide ban on production and consumption of methyl bromide, an important chemical to agricultural production and trade, a meeting was convened on 1-2 October 1998, among representatives from the United States Department of Agriculture (USDA) and officials from Mexico's Direccion General de Sanidad Vegetal, Direccion General de Control Sanitario de Bienes y Servicios, and Comision Nuclear de Seguridad Nuclear y Salvaguardias. Also present were representatives for Empacadoras de mango de Exportacion, A.C., Pulsar International and Frutas Finas Gertrudis, Mexico's fruit exporters. While the purpose of the meeting focused on cooperation between the United States and Mexico, a member from Canada's Agri-Food Ministry was present and afforded opportunities for a wider range of discussion.

The objectives of the meeting were: (1) to discuss the status of the infrastructures in the respective countries for approving irradiation for treatment of foods; (2) to explore the feasibility of the technology as a phytosanitary treatment for fresh fruits and vegetables between the two countries; (3) to identify uses of the technology of mutual interests and the possibility of exploiting them as joint project ventures; (4) to define future uses of irradiation as a quarantine treatment between Mexico and the United States; and (5) to discuss the status of implementation of the NAPPO Irradiation Standard.

Key projects were identified for Mexico and the United States to pursue together.

FSIS Workshop and Short Courses:

Representatives from the Small Plant HACCP Project conducted a HACCP Workshop at Food Technology in Mulberry, Florida, for the plant owners and managers.

FSIS was guest lecturer for two short courses at Iowa State University, August 1998.

FOOD IRRADIATION HARMONIZATION IN THE EUROPEAN UNION

Paper prepared for the 15th ICGFI meeting (Vienna, 20-22.10.1998)

**by Hippocrates VOUNAKIS
Principal Administrator, Foodstuffs Unit (III/E-1)
European Commission**

PROPOSAL FOR A EUROPEAN PARLIAMENT AND COUNCIL DIRECTIVE

- a. on the approximation of the laws of EU Member States concerning foods and food ingredients treated with ionising radiation, and
- b. on the establishment of a Community list of foods and food ingredients treated with ionising radiation.

The initial Commission proposal, submitted to the Council on 9.12.1988, contained eleven food categories. The objectives, based on the **codecision** procedure (joint Council and European Parliament decision) were:

- to lay down the rules to be observed by irradiation units (standards, inspections, records, radiation sources, etc.);
- to define the conditions for authorising foodstuff irradiation (purposes, wholesomeness of food, reasonable need for treatment);
- to establish procedures for authorisation of treatment with ionising radiation and the marketing and import of foods treated (doses and sources of radiation, inspections, labelling, etc.) and
- to establish a Community list of foods authorised for such treatment.

The European Parliament considered the text on first reading on 10.10.89, on the basis of a report drafted by a member of the "Greens" party. The Parliament proposed banning the treatment for ten of the eleven food categories of the Commission proposal and accepted it only for dried aromatic herbs, spices and vegetable seasonings.

A new Commission *amended* proposal then followed, introducing, amongst other changes, a reduction of the number of food categories authorised for irradiation treatment to eight. It restricted irradiation to cases where there were clear benefits for controlling pathogenic microorganisms in food (public health) and insects harmful to dried fruit and vegetables.

After lengthy discussions, the Council of Ministers finally agreed and adopted on 27 October 1997, a *common position*. The agreed text consisted of two directives, since, in 1992, Member States had split the initial Commission proposal into two parts:

- a **framework Directive** on the general and technical aspects which broadly satisfied Parliament on labelling and decisions to authorise products; and
- a **implementing Directive** on the list of foods to be treated, which contained only a single category of foodstuffs authorised for irradiation treatment: *the dried aromatic herbs, spices and vegetable seasonings*, as proposed by Parliament.

The Commission accepted these texts, even though they only partly met the objectives of its 1988 proposal. Five of the amendments proposed by Parliament on first reading were included in the Commission's amended proposal and two of them were finally incorporated in the Council's common position. The Council also restored six of Parliament's amendments which had not been taken up in the Commission amended proposal.

The key to finalising an overall compromise appeared to lie in the following points inextricably linked:

- the labelling of irradiated ingredients used in compound ingredients (Art. 6.1c)
- the establishment of the Community list, in stages (Article 4.2)
- the conditions under which the national authorisations would operate in a transitional period (Article 4.4)
- the procedure for later decisions, concerning transfer or not of national authorisations to the Community list. (Article 4.3)

The possibility for any other attempt to reach an agreement has been very limited, because many Member States insisted on the political nature of the proposal.

- **Labelling of irradiated ingredients (Article 6.1.c)**

On this point there has always been a tendency amongst EU members towards **complete labelling**, in the sense that if any ingredient or component of ingredient in a foodstuff were irradiated, this fact should be indicated on the label.

- **National Authorisations (Article 4):** The compromise achieved requires that:

a) National authorisations existing at the time of adoption may be maintained until the entry into force of the definitive list, provided they are cleared by the Scientific Committee for Food (SCF) and comply with the framework directive; otherwise they cease to be valid (Para.4). No new authorisation would be introduced after adoption.

b) The restriction of issuing new authorisations does not apply to products authorised in other Member States and cleared by the SCF (Para. 5).

c) The Commission shall submit proposals by 31.12.2000, to establish the Community list, taking into account existing national authorisations and the SCF opinion (Para. 3). The Council and the Parliament will decide on their eventual transfer.

d) Until completion of the definitive Community list, Member States may retain their **national bans**, *in compliance with the general rules of the EU Treaty* (Para. 7).

On 18.2.98, the Parliament considered the new Council document *on second reading*, on the basis of a new report, drafted by the Greens' party. The EP plenary session adopted 14 amendments for both Directives, mainly aiming at:

- involving Parliament in consultation of the Scientific Committee and in decisions related to safeguard measures;
- imposing in the legislation purely technical requirements, e.g. specific detection methods and procedures;

The Commission only accepted 6 amendments, and in March 1998, submitted a new amended proposal, endorsed by the Council with unanimity. When divergences between the two institutions appear at such a final stage, a new procedure called **conciliation**, has to be followed for bridging the gap. This resulted in intensive discussions among Council Parliament and Commission, the latter now serving as neutral adviser to EP, for finding compromise solutions.

Discussions so far allowed to achieve essential progress in all but one divergences, the **methods of analysis (MA)**. The Parliament wants a complementary wording, which will guarantee that MA used by Member States at the marketing stage, to detect *possible irradiation treatment of any product*, will be **validated, or standardised** ones. The real reason behind this request is the wish to link the authorisation of the process for any product, to the availability of analytical methods.

A possible solution to satisfy Parliament would probably be the consideration on an annual basis, of the methods used and their further development, by an appropriate expert committee.