

## QUARANTINE TREATMENTS FOR FRUIT FLY CONTROL

**Objective:** To reduce pest risk to a level adequate to provide quarantine security.

**Treatments:** Fumigation (using methyl bromide)

**Temperature Manipulation:**

Heat (e.g. min. 44 C for 100 minutes)

Cold (e.g. max. 2 C for 15 days)

**Irradiation:** Fruit fly

(min. dose 150 Gy)

Non-fruit fly insects

(min. 300 Gy)

1999-11-17

FEP-CT-PL99-TC MTG.

1

## Current Quarantine Treatments

Treatment	Start-up Cost per Facility (\$)	Treatment Cost per tonne (\$)	Remarks
Hot Water (Yarkin et. al, 1994)	~150,000	~240 for mangoes	Used mainly to control fruit flies in mangoes
Cold storage at 2.2° for 10-22 days (Yarkin et. al, 1994)	~200,000	46 - 600	Only applicable to 17 commodities and must be performed in APHIS-approved containers
CA Storage (EPA, 1995)	~200,000	50-600	Storage at low O <sub>2</sub> and high CO <sub>2</sub> levels for 3-4 days
Irradiation	~4,000,000	25-50	Approved by APHIS against fruit flies regardless of commodities

1999-11-17

FEP-CT-PL99-TC MTG.

2

## **ACTIONS TAKEN BY IAEA ON IRRADIATION AS A QUARANTINE TREATMENT**

### **CRPs:**

- **Irradiation as a quarantine treatment of fresh fruits and vegetables (1986-90)**
- **Irradiation as a quarantine treatment of mites, nematodes and insects other than fruit flies (1992-97)**
- **Irradiation as a phytosanitary treatment of food and agricultural commodities (1998 - to-date):  
international research protocol for non-fruit fly insects established**
- **Radiation Insect Disinfestation International Database (RID-ID) being developed**

1999-11-17

FEP-CT-PL99-TC MTG.

3

## **ACTIONS TAKEN BY IAEA ON IRRADIATION AS A QUARANTINE TREATMENT**

### **TC:**

- **RCA Training Course on Irradiation as a Quarantine Treatment of Fresh Fruits and Vegetables, Bangkok, August 1996.**
- **RCA Workshop on Harmonization of Protocol on Irradiation as a Quarantine Treatment of Fresh Horticultural Commodities, Manila, April 1999.**
- **ARCAL Expert Assistance on Development of a Harmonized Protocol on Irradiation as a Quarantine Treatment (on-going)**

1999-11-17

FEP-CT-PL99-TC MTG.

4

**ACTIONS TAKEN BY ICGFI**  
(established under the aegis of FAO, IAEA and WHO)  
**ON IRRADIATION AS A QUARANTINE  
TREATMENT**

- 1986:** A Task Force to compile and make preliminary evaluation of data on irradiation as a quarantine treatment (Chiang Mai, Thailand)
- 1991:** A Task Force to Evaluate Data on Irradiation as a Quarantine Treatment of Fresh Fruits and Vegetables (Bethesda, MD)
- 1994:** A Task Force to Develop an Administrative Procedure on Irradiation as a Quarantine Treatment of Fresh Fruits and Vegetables

1999-11-17

FEP-CT-PL99-TC MTG.

5

**IRRADIATION AS A PHYTOSANITARY  
TREATMENT ICGFI  
RECOMMENDATIONS  
(1991)**

**Min. Dose to Ensure Quarantine  
Security  
(Gy)**

- |  |            |
|--|------------|
| • Tephritid Fruit Flies<br>(Regardless of commodities) | <b>150</b> |
| • Other Species of Insects                             | <b>300</b> |

1999-11-17

FEP-CT-PL99-TC MTG.

6

## **INTERNATIONAL ACTIONS TAKEN ON IRRADIATION AS A QUARANTINE TREATMENT**

- 1992: Endorsement by Regional Plant Protection Organizations which operates within the framework of the IPPC (San Salvador)**
- 1994; NAPPO convened a Symposium on Irradiation as a Phytosanitary Treatment (Orlando, FL)**
- 1997: NAPPO issued a standard on Irradiation as a Phytosanitary Treatment**

1999-11-17

FEP-CT-PL99-TC MTG.

7

## **IRRADIATION AS A PHYTOSANITARY TREATMENT IN THE USA**

- **USDA/APHIS issued a policy permitting irradiation to control fruit flies regardless of commodities (1996)**
- **USDA/APHIS is about to issue a regulation for the use of irradiation to mitigate pests of plants and plant products**

1999-11-17

FEP-CT-PL99-TC MTG.

8

**USDA/APHIS PROPOSED POLICY ON IRRADIATION  
AS A QUARANTINE TREATMENT AGAINST FRUIT FLIES  
(REGARDLESS OF COMMODITIES)**

<b>Tephritid species</b>	<b>Common name</b>	<b>Min. Dose (Gy)</b>
<b>B. dorsalis</b>	<b>Oriental fruit fly</b>	<b>250</b>
<b>C. capitata</b>	<b>Mediterranean f.f.</b>	<b>225</b>
<b>C. cucurbitae</b>	<b>Melon f.f.</b>	<b>210</b>
<b>A. suspensa</b>	<b>Caribbean f.f.</b>	<b>150</b>
<b>A. ludens</b>	<b>Mexican f.f.</b>	<b>150</b>
<b>A. obliqua</b>	<b>West Indian f.f.</b>	<b>150</b>
<b>A. serpentina</b>	<b>Sapote f.f.</b>	<b>150</b>
<b>B. tryoni</b>	<b>Queensland f.f.</b>	<b>150</b>
<b>B. jarvisi</b>	<b>(no common name)</b>	<b>150</b>

Source: USDA/APHIS' Notice of Policy Federal Register (15 May 1996)

1999-11-17

FEP-CT-PL99-TC MTG.

9

**IRRADIATION AS A PHYTOSANITARY  
TREATMENT (HAWAIIAN SCENARIO)**

- **Started marketing fruits from Hawaii (irradiated for fruit fly control in Chicago area) since 1995, under a special permission from APHIS**
- **Irradiated fruits (papaya, lychee, cherimoya, carambola, rambutan) have been successfully marketed by over 50 retail stores in the mid-West, USA**
- **Over 250 metric tonnes of such fruits marketed to date**
- **An X-ray irradiation facility is under construction in Hilo, HI for this purpose.**

1999-11-17

FEP-CT-PL99-TC MTG.

10

## **IRRADIATION AS A PHYTOSANITARY TREATMENT IN ASIA AND THE PACIFIC**

- **A Harmonized Protocol adopted by plant quarantine officials**  
(April 1999)
- **A Guideline for the Use of Irradiation as a Phytosanitary Treatment developed**  
(April 1999)

1999-11-17

FEP-CT-PL99-TC MTG.

11

## **GLOBAL PHASE-OUT OF METHYL BROMIDE** *(under the Montreal Protocol)*

### **ADVANCED COUNTRIES**

- ◆ *25% reduction (1999)*
- ◆ *50% reduction (2001)*
- ◆ *70% reduction (2003)*

**PHASE OUT 2005**

### **DEVELOPING COUNTRIES**

- ◆ *20% reduction (2005)*

**PHASE OUT 2015**

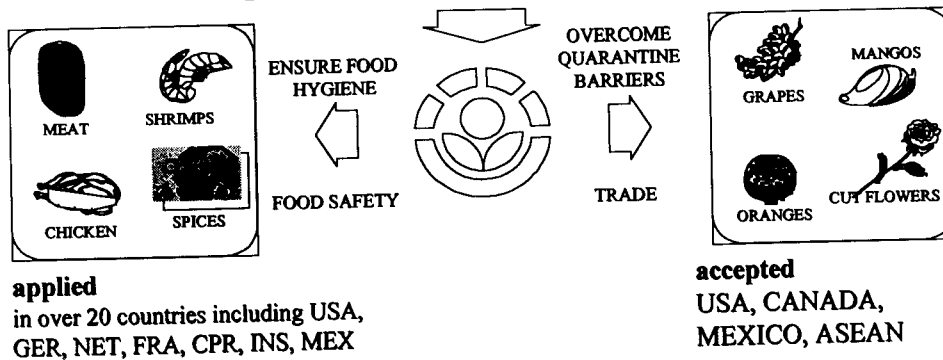
1999-11-17

FEP-CT-PL99-TC MTG.

12

# FOOD IRRADIATION

## Codex General Standard for Irradiated Foods



1999-11-17

FEP-CT-PL99-TC MTG.

13

## *The World Trade Organization*

- ◆ *Agreement on the Application of Sanitary and Phytosanitary Measures (SPS)*
- ◆ *Agreement on Technical Barriers to Trade (TBT)*

1999-11-17

FEP-CT-PL99-TC MTG.

14

**SPS AGREEMENT RECOGNIZES  
INTERNATIONAL STANDARDS, GUIDELINES  
AND RECOMMENDATIONS OF :**

- ◆ **CODEX ALIMENTARIUS COMMISSION (FOOD SAFETY);**
- ◆ **INTERNATIONAL PLANT PROTECTION CONVENTION (PLANT PROTECTION AND QUARANTINE);**
- ◆ **INTERNATIONAL OFFICE OF EPIZOOTICS (ANIMAL HEALTH).**

1999-11-17

FEP-CT-PL99-TC MTG.

15

**AGREEMENT OF THE APPLICATION OF  
SANITARY AND PHYTOSANITARY  
MEASURES (SPS AGREEMENT) ADOPTED  
DURING THE GATT URUGUAY ROUND**

- ◆ **GOVERNMENTS COULD BE REQUIRED TO FURNISH JUSTIFICATION FOR FOOD IMPORT RESTRICTIONS BASED ON NATIONAL REGULATIONS WHICH ARE STRICTER THAN RECOGNISED INTERNATIONAL STANDARDS, GUIDELINES AND RECOMMENDATIONS.**

1999-11-17

FEP-CT-PL99-TC MTG.

16

## Trade Implications on Irradiated Foods

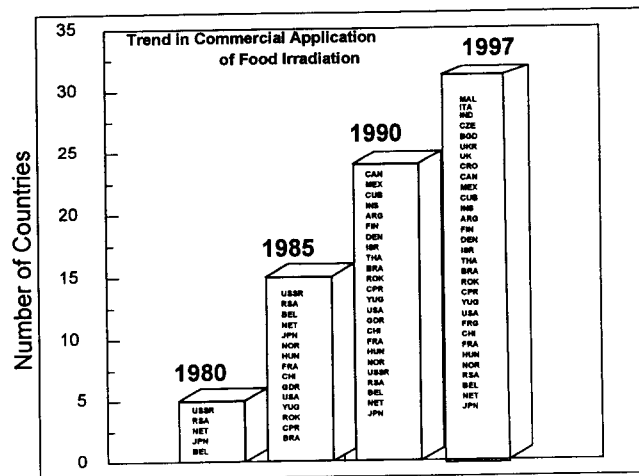
- Increasingly accepted and applied as a sanitary treatment of food, especially those of animal origin and spices (in over 20 countries).
- Increasingly accepted as a phytosanitary against fruit flies (USA, Canada, Mexico and ASEAN countries) and being applied in the USA. International trade in fresh fruits from developing countries to major importing countries (USA, Australia, Japan) is expected to start in the near future.

1999-11-17

FEP-CT-PL99-TC MTG.

17

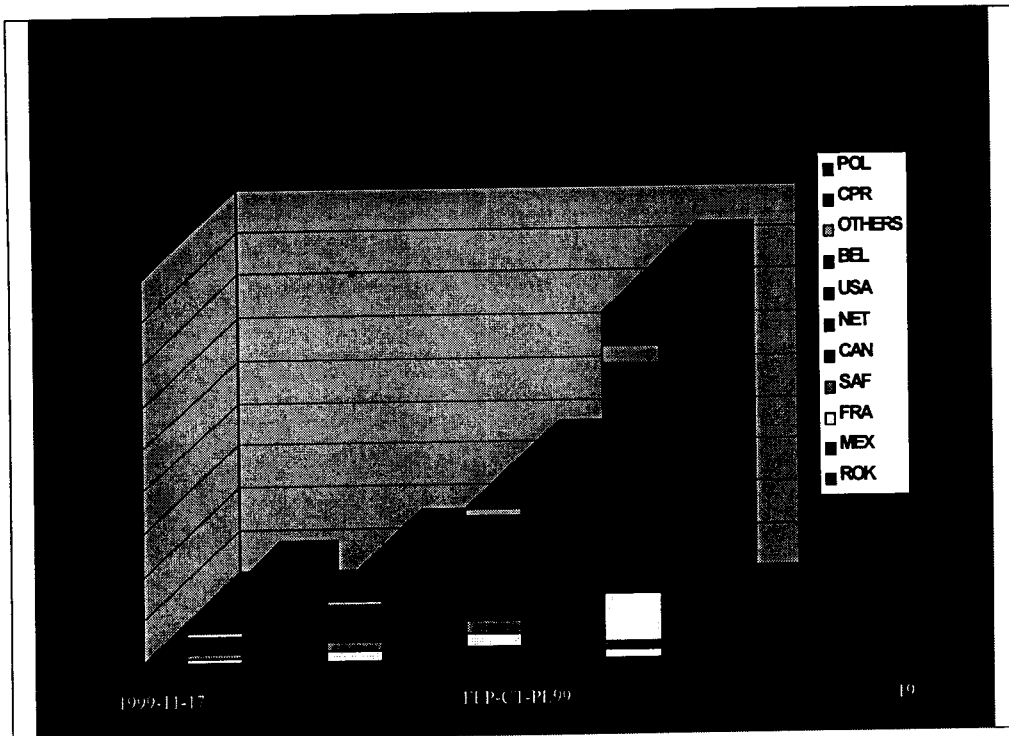
## Trend in Commercial Application of Food Irradiation



1999-11-17

FEP-CT-PL99-TC MTG.

18



## Food Preservation by Irradiation

### INCREASE SALES



with Fresh Irradiated Produce.

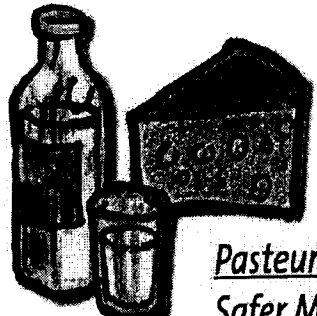

1999-11-17

FEP-CT-PL99-TC MTG.

20

**FIG. 2. IRRADIATION WILL BE AS IMPORTANT AS PASTEURIZATION, TO ENSURE HYGIENIC QUALITY OF SOLID FOOD**

*Play it safe!*

 <p><u>Pasteurization</u> Safer Milk</p>	 <p><u>Irradiation</u> Safer Food</p>
---	---

**IRRADIATED FOOD**  **THE SAFE CHOICE**

**ICGFI HOMEPAGE**

<http://www.iaea.org/icgfi>

