



Facts about Food Irradiation

Q:

1 Do measures exist to control the irradiation process to ensure that foods are properly treated?

Controlling the Process

A:

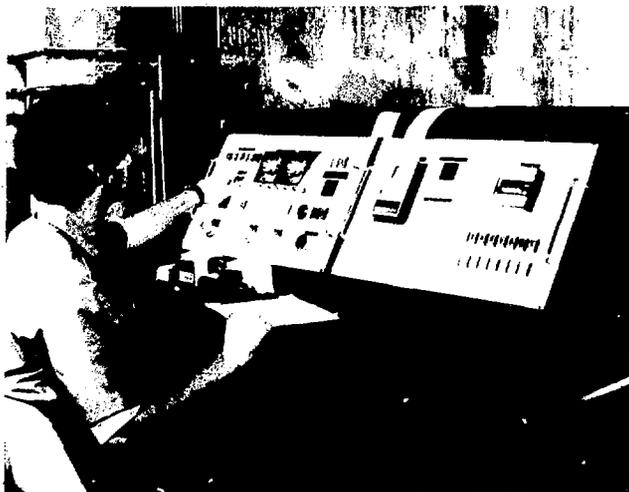
1 Yes. Over the past 30 years, laws and regulations have been promulgated to govern operations at irradiators used to process non-food products, such as medical supplies. About 160 such irradiators are operating around the world. The plants, which must be approved by governmental authorities before construction, are subject to regular inspections, audits, and other reviews to ensure that they are safely and properly operated. These types of governmental controls would also be valid for irradiation facilities processing food. For example, the principle of lot traceability is an essential part of process controls, whether the product is a pharmaceutical or a fruit, and irrespective of the technology involved.

At the international level, provisional guidelines for good manufacturing practices (GMPs) and good radiation practices for a number of foods have been prepared by the International Consultative Group on Food Irradiation (ICGFI), a joint group of the Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), and International Atomic Energy Agency (IAEA). They cover all

INTERNATIONAL CONSULTATIVE GROUP ON FOOD IRRADIATION (ICGFI)

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Control console at a food irradiation plant.



ICGFI is an international group of experts designated by Governments to evaluate and advise on global activities of food irradiation. It was established under the aegis of the Food and Agriculture Organization of the United Nations, World Health Organization, and International Atomic Energy Agency.



aspects of treatment, handling, and distribution. These guidelines provide a good basis for preparing the detailed protocols needed to implement irradiation on a commercial scale.

The guidelines emphasize that, as with all food technologies, effective quality control systems need to be installed and adequately monitored at critical control points at the irradiation facility. Foods should be handled, stored, and transported according to GMPs before, during, and after irradiation. Only foods meeting microbiological criteria and other quality standards should be accepted for irradiation.

The Codex Alimentarius Commission of FAO and WHO has further issued its recommended standards for the irradiation of food. These standards state that irradiated foods should be accompanied by shipping documents identifying the irradiator, date of treatment, lot identification, dose, and other details of treatment.

ICGFI additionally has established an international registry of irradiators that meet standards for good operations. It also organizes training courses for irradiator operators, plant managers, and supervisors on proper processing with emphasis on GMPs, dosimetry, record-keeping, and lot identification, and for food control officials on proper inspection procedures required for food irradiation processing and trade in irradiated foods. ■

2 Besides these regulatory controls, are there tests to detect whether food has been irradiated?

2 Yes, to some extent. Some scientific tests are being studied for use in determining whether foods have been irradiated. These include *thermoluminescence measurement* for detection of irradiated spices and *electron spin resonance spectroscopy* for determining irradiation of meats, poultry, and seafoods containing any bone or shells, and some specific chemical tests.

No single method, however, has yet been developed that reliably detects irradiation of all types of foods or the radiation dose levels that were used. **This is partly because the irradiation process does not physically change the appearance, shape, or temperature of products and causes negligible chemical changes in foods.**

The lack of a single test to identify a treated product is not unique to the irradiation process. Organically grown produce cannot be identified analytically, nor can meat slaughtered in accordance with Jewish or Islamic requirements. Additionally, chilled or frozen foods cannot be analyzed for unacceptable temperature fluctuations which might have occurred during distribution, nor can thermally sterilized (canned) foods be analyzed after treatment to assure that the correct time-temperature regime was applied. ■



The food irradiation process does not physically change the appearance, shape, or temperature of products and causes negligible chemical changes in foods.

Scientific and Technical References:

Codex General Standard for Irradiated Foods and Recommended International Code of Practice for the Operation of Irradiation Facilities Used for the Treatment of Food, The Codex Alimentarius, Vol. XV, (1984).

Manual of Food Irradiation Dosimetry, Technical Report Series No. 178, IAEA, Vienna (1977).

Codes of Good Irradiation Practice for Treatment of Various Food Commodities, International Consultative Group on Food Irradiation (1990).

American Society for Testing and Materials Standards, E1204 (Practice for Application of Dosimetry in the Characterization and Operation of a Gamma Irradiation Facility for Food Processing) and E1261 (for the Selection and Application of Dosimetry Systems for Radiation Processing of Food), American Society for Testing and Materials, Philadelphia, PA (1990).