



Irradiation for food safety

FOOD SAFETY concerns everyone. Growers, traders, processors, retailers and the catering industry must ensure that the food that reaches consumers is safe to eat - and they face severe penalties if it is not. International trade in food commodities is governed by standards to limit microbial contamination and insect infestation - and consignments will be rejected if standards are not met. Countries may impose import restrictions on produce that could harbour potentially damaging insect pests - closing markets to those countries that fail to meet quarantine regulations.

Irradiation is a safe, proven technology that destroys harmful bacteria and other food pests. It is rapidly gaining worldwide acceptance because it meets the strict sanitary and phytosanitary regulations that govern food trade. Consumers in many countries are now choosing to purchase irradiated food because they accept that it is safer for their families than non-irradiated food. The Joint Food and Agriculture Organization/International Atomic Energy Agency in Vienna, Austria, is providing technical assistance to Member States who wish to adopt irradiation technology in support of their international trade in food commodities and to help ensure consumer safety.

Focus on food safety

People are becoming increasingly worried about food safety and they have good reason.

- Raw foodstuffs such as poultry, meat, eggs, seafood, fruit and vegetables are frequently and unavoidably contaminated with one or more types of food borne pathogens.
- Large batch processing and rapid, global distribution, mean that a contaminated food product can harm many thousands of consumers before its source of origin is discovered.

Statistics from industrialized countries show that up to 10% of the population in these countries may suffer annually from a food borne illness. Most people recover but increasingly virulent new strains of bacteria such as *E.coli* 0157:H7, which was unknown 25 years ago, can be fatal to children, the elderly or infirm.

Food irradiation – what it is

Food is irradiated for the same reason that milk is pasteurized – to make it safe. When food is irradiated it passes through an enclosed chamber where it is exposed to ionizing energy. This penetrates the food and destroys harmful organisms without cooking or otherwise altering its physical or chemical properties. For this reason, irradiation is currently the best available technology suitable for treating raw and partially raw food. It leaves no residue, does not change the taste, colour, or smell of the food, nor does it make food radioactive.



An uncooked, fermented pork sausage called "Nham" is irradiated to render it safe for consumers at the Thai Irradiation Centre near Bangkok.

Consumers accept irradiated food

SAUSAGES made from fermented, uncooked pork wrapped in a banana leaf are considered a great delicacy in Thailand. Known as Nham, these sausages were frequently the cause of intestinal illness being highly prone to bacterial contamination. But this is no longer the case. Irradiation has provided a safe, clean and efficient way of making Nham safe for Thai consumers.

Frozen shrimp and frog legs have been routinely irradiated for many decades in Belgium, France and the Netherlands to ensure microbiological safety for consumers.

In the USA, parents are increasingly choosing irradiated beef products for family meals on the basis of safety. Large scale marketing of irradiated horticultural commodities is taking place in several States and consumers show no reluctance to purchase them. Where consumers are properly informed, they have no difficulty about accepting irradiation as a safe technology for their own protection.

D. KINLEY/IAEA

Irradiation for food safety

Food irradiation:

- greatly reduces or eliminates the number of disease-causing bacteria and other harmful organisms;
- helps to keep meat, poultry and seafood fresh; also helps to maintain certain food and vegetables for longer periods and reduce food spoilage;
- can replace potentially harmful chemical fumigants when used to eliminate insects from dried grain, legumes, spices, dried fruit etc.;
- has the potential to be used for meeting quarantine requirements for international trade in fresh fruits and vegetables; and
- is a useful treatment as a critical control point in a Hazard Analysis and Critical Control Point (HACCP) based food production process.

Who is using irradiation?

Irradiation of food products is increasingly accepted by governments because it meets the strict sanitary and phytosanitary regulations that govern food trade. Irradiation is accepted:

- by more than 50 countries for treating one or more food products or classes of food;
- within Asia, especially countries belonging to ASEAN who are interested in using irradiation for treating food both for domestic and international trade; (*see box on Thai sausages*)
- within the USA where consumers are increasingly demonstrating their preference for irradiated food because of its greater safety;
- by the food industry which recognizes the benefits of irradiation for ensuring that their food products are safe.

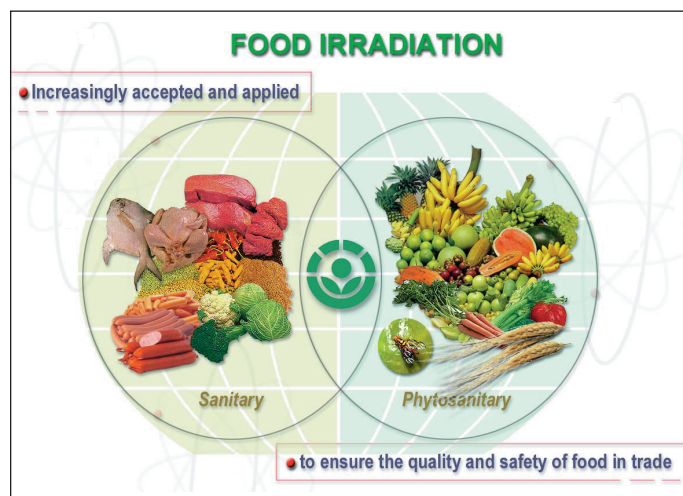
Trading, the WTO and food irradiation

The WTO Agreement on the Application of Sanitary and Phytosanitary Measures (SPS) recognizes recommendations from relevant international organizations including the Codex Alimentarius Commission which deals with food safety. In 1983, a worldwide standard for irradiated food was adopted by the Codex Alimentarius Commission which accepts:

- that irradiation is a food process comparable to heating and freezing preservation of food;
- the safety and effectiveness of irradiation; and that there are no microbiological and nutrition problems caused by irradiation of food.

National regulations on food irradiation

The IAEA is ready to assist governments to harmonize their national regulations for food irradiation. Many countries have



already adopted the Codex Standard, and many more are in the process of doing so.

Quarantine

Irradiation can also be used to overcome fruit fly infestation in fresh fruit. The process brings potentially huge benefits for those countries where fruit flies are endemic who wish to export to countries that are free of fruit fly. The United States of America has currently accepted irradiation as a quarantine treatment for the control of 11 major species of fruit flies and mango seed weevil.

Spices

SPICES AND DRIED VEGETABLE SEASONINGS must conform to microbiological standards for food processing. Normally produced in developing countries using traditional methods of handling and processing, they may be highly contaminated and, unless treated by chemical, heat or irradiation, will quickly spoil any food product of which they are an ingredient. The use of ethylene and propylene oxides has been banned in the EU but, although irradiation is a viable alternative and widely used elsewhere, especially in the USA, the volume of irradiated spices used in Europe has not increased significantly.

Future

After decades of research, development, public debate and consumer acceptance trials in many countries, irradiation has emerged as a safe and viable technology for ensuring the safety and quality of food and for combating food-borne diseases. Indeed it is currently the best available technology suitable for treating raw and partially raw food products and those countries which adopt it will benefit greatly in both domestic and international markets.

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