factsheet

# Food Irradiation

Food safety and food security are immensely important matters. Food safety relates to the avoidance of illness or death arising from consuming foods that contain e.g. Salmonella or E. coli. Food security requires that post harvest losses are minimised thereby ensuring that the global village has access to an adequate supply of food from available resources and that imports and exports meet domestic and international quarantine requirements.

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## Application

Controlled amounts of ionizing energy can kill parasites or microorganisms such as moulds, yeasts and bacteria (e.g. Salmonella or E. coli) that cause food spoilage or food poisoning. Food irradiation can prevent pests from developing in stored products or from travelling with the food traded regionally or internationally. Irradiation can advantageously replace the use of some preservatives or pesticides and it avoids the use of damaging heat so it can be applied to frozen or fresh food. Irradiation can penetrate sealed packages so the risk of re-infestation of recontamination is minimised.

## Effects

The effects that irradiation has on food have been more thoroughly studied than for any other food process. After more than fifty years of international research there is a widely held scientific consensus that irradiated food is safe to eat. The research has been extensive and has included various methodologies including multi-generations animal studies covering chemical, nutritional, microbiological and sensory aspects. The studies have concluded that changes in the chemical composition of the food is minimal and can only be detected using sophisticated forms of analysis that are able to detect if a food has been irradiated or not. As with most other processes there can be some impact on nutrients with some vitamins being more sensitive than others. The overall consensus is, however, that irradiation presents no health risks and that it is an effective treatment for a range of foods.

## International Standards

International organisations, including the World Health Organisation, have stated that foods treated by irradiation poses no particular toxicological, microbiological or nutritional problem. Food irradiation is now permitted for various categories of products in nearly 80 countries. All require that labels mention that the product was irradiated and many permit use Radura logo (picture). The international reference standard is the Codex Alimentarius General Standard for Irradiated Food (Codex STAN 106-1983, Rev.1-2003). The International Organisation for Standardization (ISO) published a standard (ISO 14470) concerning the requirements for the development, validation and routine control of the process of irradiation using ionizing radiation for the treatment of food.

Food traders and manufacturers have been slow to adopt the technology as they fear that consumers will not buy irradiated food however there is now enough commercial experience to demonstrate that their reluctance may not be justified. Asia-Pacific and China in particular is leading the way by being the largest consumers of irradiated food. The European Union (EU), with two 1999 Directives which restrict the use of irradiation, is lagging behind other developed regions of the world.

## Recent Developments

Low energy electron beam and X ray systems offer interesting solutions that could lead to the development of in-line irradiation processes that could be integrated into existing food manufacturing lines.