
Food irradiation

Summary

- Food irradiation is a form of food processing that can extend shelf life and reduce spoilage.
 - Foods are exposed to radiation to kill insects, moulds and micro-organisms, but no detectable levels of radiation are left behind in the food.
 - It is mandatory for irradiated foods to be labelled in accordance with regulations by FSANZ.
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Food irradiation is a processing and preservation technique with similar results to freezing or pasteurisation. During this procedure, the food is exposed to doses of ionising energy, or radiation. At low doses, irradiation extends a product's shelf life. At higher doses, this process kills insects, moulds, bacteria and other potentially harmful micro-organisms.

Considerable scientific research over the past five decades indicates that food irradiation is a safe and effective form of processing. Food irradiation has been approved in 40 countries including Australia, the United States, Japan, China, France and Holland.

To date, in Australia and New Zealand, only herbs and spices, herbal infusions and some tropical fruits are approved for irradiation by Food Standards Australia New Zealand (FSANZ), in accordance with the FSANZ *Food Standards Code*. For each of these, FSANZ has established that there are no safety concerns and no significant nutritional changes to the food as a result of food irradiation. Irradiated foods will be clearly labelled so that consumers can make an informed choice.

Irradiated foods and radioactivity

There is a common misconception that irradiated food is radioactive. The radiation used to process foods is very different from the radioactive fallout that occurs after, for example, a nuclear accident.

In food processing, the radioactive sources permitted do not generate gamma, electrons or x-rays of sufficient high energy to make food radioactive. No radioactive energy remains in the food after treatment.

The World Health Organization (WHO), the American Dietetic Association and the Scientific Committee of the European Union are three internationally recognised bodies that support food irradiation.

Food irradiation procedure

The food is exposed to ionising radiation, either from gamma rays or a high-energy electron beam or powerful x-rays. Gamma rays and x-rays are a form of radiation that shares some characteristics with microwaves, but with much higher energy and penetration.

The rays pass through the food just like microwaves in a microwave oven, but the food does not heat up to any significant extent. Exposure to gamma rays does not make food radioactive. Electron beams and x-rays are produced using electricity, which can be switched on or off, and they do not require radioactive material.

In both cases, organisms that are responsible for spoiling foods – such as insects, moulds and bacteria, including some important food poisoning bacteria – can be killed. Food irradiation cannot kill viruses.

Benefits of food irradiation

Some of the benefits of this food processing technique include:

- extended shelf life of some products
 - less food spoilage
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- reduced risk of food-borne diseases caused by micro-organisms such as *Campylobacter*, *Salmonella*, *E. coli* and *Listeria* (especially in meat, poultry and fish)
- less need for pesticides
- less need for some additives, such as preservatives and antioxidants
- lower risk of importing or exporting insect pests hidden inside food products
- reduced need for toxic chemical treatments, such as those used to kill bacteria found in some spices
- as an alternative to current treatment for disinfecting imported fruits, grains and vegetables, which uses an ozone-depleting gas
- reduced sprouting in potatoes, onions, herbs and spices.

Effects of irradiation on food

Some foods, such as dairy foods and eggs, cannot be irradiated because it causes changes in flavour or texture. Fruits, vegetables, grain foods, spices and meats (such as chicken) can be irradiated.

Irradiation causes minimal changes to the chemical composition of the food, however, it can alter the nutrient content of some foods because it reduces the level of some of the B-group vitamins. This loss is similar to those that occur when food is cooked or preserved in more traditional and accepted ways, such as canning or blanching.

Community reactions to food irradiation

People have expressed a number of concerns in relation to food irradiation. They include:

- radioactivity – a belief that irradiated food is radioactive and therefore harmful to eat. Irradiated foods do not become radioactive. Extensive testing has demonstrated that irradiating food is as safe as canning, pasteurising and freezing
- lack of choice – Australian consumers have indicated they want to be able to choose between irradiated and non-irradiated foods. However, this is regulated by FSANZ through mandatory labelling
- effects on food hygiene – there are concerns that the extensive use of this method of food preservation may result in less stringent food hygiene and handling practices. Irradiation is not a substitute for good hygienic practices
- natural warning signs eliminated – concern that irradiation will make it difficult to tell if foods are old or have gone 'off', because normal indicators like smell or mould are destroyed by irradiation
- not for consumer's benefit – concern that food irradiation is driven purely by market needs, rather than consumer demand.

Labelling of irradiated foods

If a food has been irradiated or contains irradiated ingredients or components, it must be labelled with a statement that the food, ingredients or components have been treated with ionising radiation.

If a food product does not have a label (such as whole fruits sold loose), this statement must be displayed in close proximity to the food. In addition to mandatory labelling, irradiated foods may also be marked with a symbol called a 'radura', which is the international symbol for irradiation.

Proper food handling is still needed

Food irradiation can only be used if it fulfils a technological need or is necessary for a food safety or food hygiene purpose. It does not replace the need for correct food handling practices in industry and in the home. For instance, a few bacteria may survive the irradiation of meat. If the meat is left unrefrigerated, these bacteria could still multiply and cause food poisoning.

Where to get help

- Dietitians Association of Australia Tel. 1800 812 942

Things to remember

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radiation are left behind in the food.

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This page has been produced in consultation with and approved by:

Deakin University - School of Exercise and Nutrition Sciences

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