



The facts about food irradiation

What is food irradiation?

Irradiation of food involves exposing the food to a radiation field. Radiation is a source of ionising energy and under the Food Standards Code (the Standard), which sets the standards for food radiation in Australia (and New Zealand), this energy can be in certain specified forms.

This includes electron beam and X-ray technologies which allow the energy source to be switched on and off and do not use radioactive material. Gamma rays are also permitted as the energy source. Gamma rays are generated from the radioactive source Cobalt 60.

Why is food irradiated?

Food is irradiated for many reasons. It is used by food processors to destroy bacteria including the parasites, moulds and yeasts that spoil food and salmonella and campylobacter that cause illness. Irradiation can treat insect infestation, microbiological contamination and extend the shelf-life of food. It also ensures that food products are suitable for international trade by meeting rigid import standards of quality and quarantine.

What is the process of food irradiation?

Food undergoing the irradiation process never comes into direct contact with the radiation source. The source is in a room that is designed to protect workers and the external environment from the radiation within it. The food is moved into the radiation field via a conveyor belt. The gamma or X-rays irradiating the food kills bacteria, insects and pathogens and renders them unable to reproduce and biologically inactive.

Is irradiated food radioactive?

No. The amount of radiation to which the food is exposed is carefully monitored to ensure the desired outcome is achieved without harming the food. The food itself does not become radioactive because the radiation used in the process does not have enough energy to alter the molecular structure of any of the atoms in the food. It is therefore impossible for this radiation to make the food radioactive and no radiation remains after the food has been treated.

How does irradiation affect the food?

When performed in accordance with good manufacturing practice, food irradiation has been shown to be a safe and effective way to extend shelf life, eradicate pests and inactivate food poisoning bacteria'.

Does irradiation affect the food's nutritional value?

All food preservation methods change the composition of the food in some way. Some change the taste, appearance, texture, composition and nutritional value of the food more than others do. However, research has shown that in the case of irradiation, the change in the chemical composition of the food is minimal. Many of the resulting compounds are the same as those formed when food is cooked or preserved in more traditional ways.

Just as vitamins vary in their sensitivity to heat, they also vary in their sensitivity to radiation. This sensitivity depends upon the conditions under which food is irradiated. Vitamins A, B-1 (thiamine), C, E and K in foods are relatively sensitive to radiation, while some other B vitamins such as riboflavin, niacin and Vitamin D are not.

At the irradiation conditions recommended, these losses are in the order of 10-20% or less and are comparable to those seen with other forms of food preservation, such as thermal processing (eg. cooking), and drying.

Macronutrients (eg. protein, carbohydrates and fat) and essential minerals are not affected.

Can irradiation be used to improve rotten food?

No. Nothing can re-generate rotten food. Food irradiation will also never replace proper food handling procedures in the food distribution system, or in the home.

Does irradiation kill all bacteria in food?

No. Irradiation does not kill all bacteria. For example, it does not kill the bacteria that cause botulism. It also does not kill viruses or bacterial toxins.

Are irradiation facilities safe for workers and the environment?

Yes. Queensland Health administers the *Radiation Safety Act 1999*, which imposes strict requirements on companies who possess radioactive sources. These regulations oversee the importation, use, storage, transport and disposal of a radiation source.

Is the irradiation of food permitted in Australia?

Under the *Food Act 2006*, Standard 1.2.3 of the Food Standards Code prohibits the irradiation of food, or ingredients or components of food, unless a specific permission is given. The specific permission may impose conditions relating to matters such as dose, packaging materials, approved premises or facilities.

Foods permitted to be irradiated are specified in the Standard and include certain kinds of tropical fruit, herbs, spices and herbal infusions, in accordance with certain conditions for that food specified in the Standard.

Some of the general conditions that also apply to any food that is permitted to be irradiated, include that:

- food should be processed by irradiation only where such processing fulfils a technological need or is necessary for a purpose associated with food safety and should not be a substitute for good manufacturing practices; and
- the absorbed radiation dose applied for the purpose of irradiating food should be the minimum that is reasonable in relation to the technological and public health purposes to be achieved, and should also be in accordance with good manufacturing processing practice.

How will I know if the food I eat is irradiated?

The labelling on a package of irradiated food must include a statement to the effect that the irradiated food has been treated with ionising radiation.

If the irradiated food is an ingredient or component of a food, the declaration that the ingredient or component is irradiated, may be included in the ingredient list or elsewhere on the label. If the food is exempt from full labelling requirements as set out in Standard 1.2.1, the declaration must be displayed on or in connection with the food.

If the food is other than for retail sale, the label on the package of food must include:

- a statement that the food has been irradiated;
- the minimum and maximum dose of the irradiation;
- the identity of the facility where the food was irradiated; and
- the date or dates of irradiation.

For further information

Contact your local Queensland Health Population Health Unit if you have any further questions (contact details below).

Queensland Health Population Health Units

Population Health Unit	Phone number
Brisbane Northside	3624 1111
Brisbane Southside	3000 9148
Bundaberg/ Wide Bay	4150 2780
Cairns	4050 3600
Gold Coast	5509 7222
Ipswich/ West Moreton	3810 1500
Mackay	4968 6611
Rockhampton	4920 6989
Sunshine Coast	5409 6600
Toowoomba/ Darling Downs	4631 9888
Townsville	4753 9000

