

Food Safety



Fact Sheet

Ten Most Commonly Asked Questions About Food Irradiation

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1. Why is food irradiated?

Food is irradiated to provide the same benefits as when it is processed by heat, refrigeration, freezing or treated with chemicals—to destroy insects, fungi or bacteria that cause food to spoil or cause human disease and to make it possible to keep food longer and in better condition in warehouses and homes.

Because irradiation destroys disease-causing bacteria and reduces the incidence of food borne illness, hospitals sometimes use irradiation to sterilize food for immuno-compromised patients.

2. Are irradiated foods still nutritious?

Yes. Irradiated foods are wholesome and nutritious.

All known methods of food processing—and even storing food at room temperature for a few hours after harvesting—can lower the content of some nutrients, such as vitamins. At low doses of radiation, nutrient losses are either not measurable or, if they can be measured, are not significant. At the higher doses used to extend shelf-life or control harmful bacteria, nutritional losses are less than or about the same as cooking and freezing.

3. Does irradiation make food radioactive?

No. Radioactivity in foods can occur by two routes: contamination of foods with radioactive substances or by penetration of energy into the nuclei of the atoms that make up the food.

The irradiation process involves passing food through an irradiation field; however, the food itself never contacts a radioactive substance. Also, the ionizing radiation used by irradiators is not strong enough to disintegrate the nucleus of even one atom of a food molecule.

4. Does eating irradiated food present long-term health risks?

No. Federal government and other scientists reviewed several hundred studies on the effects of food irradiation before reaching conclusions about the general safety of the treatment. In order to make recommendations specifically about poultry irradiation, U.S. Food and Drug Administration scientists reviewed findings from additional relevant studies.

Independent scientific committees in Denmark, Sweden, United Kingdom and Canada also have reaffirmed the safety of food irradiation. In addition, food irradiation has received official international endorsement from the World Health Organizations and the International Atomic Energy Agency.

5. Does irradiation destroy all bacteria, resulting in a sterile produce?

Irradiation, at the levels normally used in food processing, destroys most, but not necessarily every single microorganism present; it does not sterilize the food.

As with any food, consumers must take appropriate precautions, such as refrigeration and proper handling and cooking, to make sure that potentially harmful organisms do not present a problem.

After treatment, the surviving disease-causing and food spoilage organisms may start to multiply again if the food is not properly handled. The disease-causing organisms in irradiated food are just as dangerous, but not more so, as the same organisms in non-irradiated food.

One concern has been that irradiation does not kill the bacteria that causes botulism. However, studies also have shown that in both irradiated and non-irradiated food, spoilage organisms will grow and alert consumers to spoilage before botulism-causing bacteria can produce toxin.

6. Does irradiation cause chemical changes in food, producing substances not known to be present in non-irradiated food?

Yes, irradiation does produce chemical changes in foods. These substances, called “radio lytic products,” may sound mysterious, but they are not. They have been scrutinized by scientists in making safety assessments of irradiated foods.

Any kind of treatment causes chemical changes in food. For instance, heat treatment, or cooking, produces chemicals that could be called “thermolytic products.” Scientists find the changes in food created by irradiation minor to those created by cooking. The products created by cooking are so significant that consumers can smell and taste them, whereas only a chemist with extremely sensitive lab equipment may be able to detect radio lytic products.

7. Will my risks of radiation exposure increase significantly if I live next to an irradiator?

No. The use and transportation of radioactive materials, including the facilities in which they are used and the equipment in those facilities, is closely monitored by the Nuclear Regulatory Commission, state agencies and the Department of Transportation.

The radioactive material itself is sealed within two layers of metal that prevent corrosion and oxidation. When shipped, it is placed within brick layers of lead that prevent gamma rays from escaping.

Facilities must include many safety features to prevent both environmental and worker exposure. For example, when radioactive cobalt is in the storage position in an irradiator, it is under water and otherwise shielded. The irradiator is operated by remote control, and many other protections are required to prevent workers from entering the irradiation enclosure.

8. For what other purposes is irradiation technology now used in the United States?

In addition to cancer treatment, irradiation is used for many purposes, including: performing security checks on hand luggage at airports, making tires more durable, sterilizing manure for gardens, making non-stick cookware coatings, purifying wool, sterilizing medical products like surgical gloves, and destroying bacteria in cosmetics.

9. Are irradiated foods on the market now?

Until recently, only irradiated dried spices and enzymes were marketed in the United States. In January 1992, irradiated Florida strawberries were sold at a North Miami supermarket. Sales of irradiated products are ongoing in several grocery stores. Poultry irradiation began commercially in 1993.

Irradiation of food has been approved in 37 countries for more than 40 products. The largest marketers of irradiated food are Belgium and France (each country irradiates about 10,000 tons of food per year), and the Netherlands (which irradiates about 20,000 tons per year).

10. How can irradiated foods be identified in the market?

Irradiated food cannot be recognized by sight, smell, taste, or feel. Irradiated foods will be labeled with a logo, along with the words “Treated with Radiation,” or “Treated by Irradiation.”

(This publication includes information modified from the Food Inspection Service, USDA, information on irradiation.)

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