



HEALTH PHYSICS SOCIETY

Specialists in Radiation Safety

FOOD IRRADIATION

HEALTH PHYSICS SOCIETY FACT SHEET

What is food irradiation?

Food irradiation involves briefly exposing foods to a radiant energy source such as gamma rays, x rays, or electron beams within a shielded facility. Food irradiation is a process applied to certain foods to obtain the following results:

- Reduce disease-causing microbes and food-borne illness
- Extend food shelf life
- Avoid the use of powerful insecticides
- Prevent post-harvest losses by inhibiting sprouting in root, tuber, and bulb crops
- Provide a brief quarantine treatment of imported food that allows shipment of riper, more valuable fruits

Is irradiated food radioactive?

No, irradiated food never contacts any radiation sources, so it never has the opportunity to become radioactive. If a radioactive source is used, it is contained in a dense metal apparatus (or in the case of a cobalt-60 irradiator, stainless steel tubes) that allows the radiation to be emitted in a controlled manner, similar to a lightbulb. If high-energy electrons or x rays are used, all radiation is generated electrically and there is no radiation or radioactivity at all when the process is switched off. When the radiation is “on” (just as when the lightbulb is on) food passes through the radiation field (the area illuminated by the bulb) and is treated or irradiated. When the radiation beam is turned off (just as when lightbulb is off) the irradiation stops. This radiation cannot cause food to become radioactive just as a dental x ray does not cause a person to become radioactive.

Does irradiation harm food or make it harmful to eat?

No. Food irradiation has been studied more than any other food preservation process. Comparisons of the nutritional value of irradiated food with nonirradiated food reveal little difference. Processing food by traditional means, such as cooking or canning, causes chemical changes within the food. Radiation can also cause some minor chemical changes within the food. Food that is irradiated at regulated doses may lose some nutritional value, including vitamins, but the loss is not considered significant in terms of the entire diet. The food-irradiation process can be tailored to give the proper amount of radiation to each kind of food to obtain the desired pathogen reduction while maintaining nutritional value. No studies to date have shown that consuming irradiated food is harmful to humans. In short, food irradiation is safe and, by killing dangerous microbes, it makes the food supply much safer than use of nonirradiated foods. Irradiation kills *E. coli* and salmonella (two of the more common bacteria in meat) at least 99% of the time.

Should irradiated foods be prepared differently from nonirradiated foods?

No, irradiated foods should still be handled and prepared like nonirradiated foods. For instance, ground beef should be prepared and cooked to the recommended temperature of 160 degrees Fahrenheit. After cooking, follow standard procedures for refrigerating leftovers. Microbes are greatly reduced with irradiation but food can still be infected during storage and preparation.

How are food irradiators regulated?

Food irradiators utilizing radiation sources or high-energy x rays and electron beams are strictly regulated by federal and/or state licensing agencies that provide health and safety guidelines for employees and the general public. Products currently approved for irradiation by the US Food and Drug Administration are the following (with the purpose for irradiation in parentheses):

- Wheat and wheat flour (disinfestation of insects)
- White potatoes (inhibit sprouting and extend shelf life)
- Spices, herbs, and dry vegetable seasonings (disinfestation of insects and decontamination)
- Pork carcasses or fresh, nonheat-processed cuts (control of *Trichinella spiralis* and/or microorganisms)
- Fruit (delay of maturation and disinfestation of insects)
- Fresh vegetables (disinfestation of insects)
- Fresh or frozen poultry (control of microorganisms, particularly salmonella)
- Fresh, frozen, or chilled red meat (control of *E. coli* and salmonella)
- Animal and pet food (control of salmonella)

The 1958 Food Additives Amendment to the Federal Food, Drug, and Cosmetic Act defined ionizing radiation as a food additive, rather than a process, even though from a physics point of view nothing but energy is added. This Act mandates the Food and Drug Administration (FDA) to regulate food irradiation. The green “radura” symbol is internationally recognized as an indication of irradiated food and is displayed on foods offered for sale to the public. The label stating “Treated with Radiation” or “Treated by Irradiation” appears on the product. Approximately 40 countries, including the United States and of America, sell irradiated food.



ORGANIZATIONS THAT SUPPORT FOOD IRRADIATION

American Medical Association
 American Dietetic Association
 American Council on Science and Health
 Centers for Disease Control and Prevention
 Council for Agricultural Science and Technology
 National Food Processors Association

United States Department of Agriculture
 US Food and Drug Administration
 World Health Organization
 American Veterinarian Medical Association
 Institute of Food Technologists

* The Health Physics Society is a nonprofit scientific professional organization whose mission is excellence in the science and practice of radiation safety. Since its formation in 1956, the Society has grown to approximately 6,000 scientists, physicians, engineers, lawyers, and other professionals representing academia, industry, government, national laboratories, the Department of Defense, and other organizations. Society activities include encouraging research in radiation science, developing standards, and disseminating radiation safety information. Society members are involved in understanding, evaluating, and controlling the potential risks from radiation relative to the benefits. Official position statements are prepared and adopted in accordance with standard policies and procedures of the Society. The Society may be contacted at 1313 Dolley Madison Blvd., Suite 402, McLean, VA 22101; phone: 703-790-1745; fax: 703-790-2672; email: HPS@BurkInc.com.