

Food Irradiation: A Safe Measure

U.S. Food and Drug Administration

Food safety is a subject of growing importance to consumers. One reason is the emergence of new types of harmful bacteria or evolving forms of older ones that can cause serious illness. A relatively new strain of *E. coli*, for example, has caused severe, and in some cases life-threatening, outbreaks of food-borne illness through contaminated products such as ground beef and unpasteurized fruit juices.

Scientists, regulators and lawmakers, working to determine how best to combat food-borne illness, are encouraging the use of technologies that can enhance the safety of the nation's food supply.

Many health experts agree that using a process called irradiation can be an effective way to help reduce food-borne hazards and ensure that harmful organisms are not in the foods we buy. During irradiation, foods are exposed briefly to a radiant energy source such as gamma rays or electron beams within a shielded facility. Irradiation is not a substitute for proper food manufacturing and handling procedures. But the process, especially when used to treat meat and poultry products, can kill harmful bacteria, greatly reducing potential hazards.

The Food and Drug Administration has approved irradiation of meat and poultry and allows its use for a variety of other foods, including fresh fruits and vegetables, and spices. The agency determined that the process is safe and effective in decreasing or eliminating harmful bacteria. Irradiation also reduces spoilage bacteria, insects and parasites, and in certain fruits and vegetables it inhibits sprouting and delays ripening. For example, irradiated strawberries stay unspoiled up to three weeks, versus three to five days for untreated berries.

Food irradiation is allowed in nearly 40 countries and is endorsed by the World Health Organization, the American Medical Association and many other organizations.

Irradiation does not make foods radioactive, just as an airport luggage scanner does not make luggage radioactive. Nor does it cause harmful chemical changes. The process may cause a small loss of nutrients but no more so than with other processing methods such as cooking, canning, or heat pasteurization. Federal rules require irradiated foods to be labeled as such to distinguish them from non-irradiated foods.

Studies show that consumers are becoming more interested in irradiated foods. For example, the University of Georgia created a mock supermarket setting that explained irradiation and found that 84 percent of participating consumers said irradiation is "somewhat necessary" or "very necessary." And consumer research conducted by a variety of groups, including the American Meat Institute, the International Food Information Council, the Food Marketing Institute, the Grocery Manufacturers of America, and the National Food Processors Association has found that a large majority of consumers polled would buy irradiated foods.

Some special interest groups oppose irradiation or say that more attention should be placed on food safety in the early stages of food processing such as

in meat plants. Many food processors and retailers reply that irradiation can be an important tool for curbing illness and death from food-borne illness. But

it is *not* a substitute for comprehensive food safety programs throughout the food distribution system. Nor is irradiation a substitute for good food-handling practices in the home.

Questions and Answers About Irradiation

What is food irradiation?

Food irradiation is a process in which food products are exposed to a controlled amount of radiant energy to kill harmful bacteria such as *E. coli* O157:H7, *Campylo-bacter*, and *Salmonella*. The process also can control insects and parasites, reduce spoilage, and inhibit ripening and sprouting.

Is irradiated food safe?

Yes. The Food and Drug Administration has evaluated the safety of this technology over the last 40 years and has found irradiation to be safe under a variety of conditions and has approved its use for many foods. Scientific studies have shown that irradiation does not significantly reduce nutritional quality or significantly change food taste, texture or appearance. Irradiated foods do not be-come radioactive. Irradiation can produce changes in food, similar to changes caused by cooking, but in smaller amounts.

How does irradiation work?

Food is packed in containers and moved by conveyer belt into a shielded room. There the food is exposed briefly to a radiant-energy source the amount of energy depends on the food. Energy waves passing through the food break molecular bonds in the DNA of bacteria, other pathogens, and insects. These organisms die or, unable to reproduce, their numbers are held down. Food is left virtually unchanged, but the number of harmful bacteria, parasites and fungi is reduced and may be eliminated.

How do I know if food has been irradiated?

FDA currently requires that irradiated foods include labeling with either the statement "treated with radiation" or "treated by irradiation" and the international symbol for irradiation, the radura (pictured at the top of this document).

Are irradiated foods available now?

Not widely yet. Some stores have sold irradiated fruits and vegetables since the early 1990s. Irradiated poultry is available in some grocery stores mostly small, independent markets and on menus of a few restaurants.

On the other hand, some spices sold wholesale in this country are irradiated, which eliminates the need for chemical fumigation to control pests. American astronauts have eaten irradiated foods in space since the early 1970s. Patients with weakened immune systems are sometimes fed irradiated foods to reduce the chance of a life-threatening infection.

Are food irradiation facilities safe for workers and surrounding communities?

Yes. The transport and handling of radioactive material is strictly regulated, and irradiation facilities are made to withstand natural disasters such as earthquakes. The radioactive cobalt commonly used is made specially to serve as a safe radiation source for hospitals and irradiation facilities. Workers in irradiation plants are protected by thick walls surrounding the radiation source. If workers need to enter the irradiating room, the energy source is lowered into a pool of water that absorbs the radiation and protects the workers from any exposure. In electron beam facilities, the energy source is turned off. There are about 30 licensed irradiation facilities in the United States, used mainly to sterilize medical equipment, many consumer products, and, in some cases, food.

Will irradiated foods cost more?

Irradiated products sold to date have cost slightly more than their conventional counterparts. Some industry experts estimate the increase at two to three cents per pound for fruits and vegetables and three to five cents a pound for meat and poultry products. But these costs may be offset by advantages such as keeping a product fresh longer and enhancing its safety. Food trade groups say that as irradiated foods become more widespread, their cost is likely to drop.

Proper Food Handling Still Needed

Experts emphasize that though food irradiation can reduce food-borne illness risk, the process *complements*, but doesn't replace, proper food handling practices by producers, processors and consumers. For example, a few bacteria may survive the irradiation process in meats and poultry and could multiply if the meat is left unrefrigerated. Also, bacteria from other foods can be carried to irradiated foods if care isn't taken to avoid cross-contamination. So consumers should continue to follow these food safety precautions:

- **Clean**--Wash hands in hot, soapy water before preparing food and after using the bathroom, changing diapers and handling pets. Wash cutting boards, knives, utensils and countertops in hot, soapy water after preparing each food item and before going on to the next one.
- **Separate**--Avoid cross-contamination by keeping raw meat, poultry and seafood separate from other foods in the grocery cart and in the refrigerator. If possible, use one cutting

board for raw meat products and another for salads and other foods that are ready to be eaten. Don't place cooked food on a plate that has held raw meat, poultry, seafood, or uncooked marinades.

- **Cook**--Use a meat thermometer to measure the internal temperature of cooked meat and poultry to ensure thorough cooking. Ground poultry should be cooked to at least 165 degrees F; ground meat, 160 degrees F; roasts and steaks, 145 degrees F; and poultry (whole bird), 180 degrees F. Cook eggs until the yolk and white are firm, and cook fish until it is opaque and flakes easily. Boil sauces, soups and gravy when reheating, and heat other leftovers to 165 degrees F.
- **Chill**--Refrigerate or freeze perishables, prepared foods, and leftovers within two hours. Never defrost or marinate foods on the counter. Use the refrigerator, cold running water, or a microwave oven. Divide large amounts of leftovers into small, shallow containers for quick cooling in the refrigerator. Remove stuffing from poultry and other stuffed meats after cooking and refrigerate in a separate container. Don't pack the refrigerator full. Cool air must circulate to keep food safe.

Call 1-888-SAFEFOOD for more information on food safety.

The organizations listed below have contributed to the content and printing of this brochure:

American Meat Institute
Department of Health and Human Services (U.S. Food and Drug Administration)
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