

Food Irradiation

New types of harmful bacteria or evolving forms of older ones that can cause serious illness have led scientists to develop technologies that can help safeguard the nation's food supply. A relatively new strain of *E. coli*, for example, has caused severe and in some cases life-threatening outbreaks of foodborne illness through contaminated products such as ground beef and unpasteurized fruit juices. Irradiation can be an effective way to help reduce foodborne hazards and ensure that harmful organisms are not in the foods we buy.

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* 0157:H7, *Campylobacter* and *Salmonella*. The process also can control insects and parasites, reduce spoilage, and inhibit ripening and sprouting. However, irradiation is not a substitute for proper handling procedures during manufacturing and at home. For example, perishable foods must still be kept in the refrigerator or freezer at all times.

WHAT ARE THE BENEFITS?

Food is irradiated to make it safer by destroying harmful bacteria, parasites, insects and fungi. Irradiation does not destroy all disease-causing organisms, which is why perishable irradiated foods must still be kept in the refrigerator or freezer. Neither does it cook foods, so irradiated meat is still not safe to eat raw.

Irradiation also reduces food spoilage. Like freezing, canning and drying, irradiation can extend the storage time of perishable food products. For example, irradiated strawberries stay unspoiled in the refrigerator for up to three weeks as compared to three to four days for untreated berries.

ARE IRRADIATED FOODS SAFE?

The Food and Drug Administration (FDA) has evaluated the safety of irradiation over the last 50 years and has found it to be safe. Irradiation produces fewer changes in foods than those caused by cooking. Scientific studies have shown that irradiation does not significantly reduce nutritional quality or significantly change food taste, texture or appearance. Irradiated foods do not become radioactive.

HOW DOES IRRADIATION WORK?

Food is packed in containers and moved by conveyor belt into a shielded room. There the food is exposed briefly to a radiant-energy source. The amount of energy used depends on the type of 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.

HOW DO I KNOW IF FOOD HAS BEEN IRRADIATED?

FDA currently requires that irradiated foods be labeled with a statement such as "treated with radiation" or "treated by irradiation". They must also show the international symbol for irradiation called the radura.



ARE IRRADIATED FOODS AVAILABLE?

Not widely yet. Some stores have sold irradiated fruits and vegetables since the early 1990s. Irradiated poultry is available in some grocery stores and on menus of a few restaurants. Some meat products such as ground beef have been available in South Carolina markets since early 2002. Some spices sold wholesale in this country are irradiated, which eliminates the need for chemical fumigation to control pests. American astronauts have eaten irradi-

ated foods in space since the early 1970s. Hospital patients with weakened immune systems may be given irradiated foods to reduce the chance of a life-threatening infection.

Fully cooked meat and poultry products such as luncheon meats and hot dogs have not been approved for irradiation. Foods labeled “organic” may not be irradiated.

DO IRRADIATED FOODS COST MORE?

Irradiated products have cost slightly more than conventional foods: about two to three cents more per pound for fruits and vegetables, and up to 25 cents more per pound for meat and poultry products. These costs may be offset by advantages such as keeping a product fresh longer and enhancing its safety. As irradiated foods become more widespread, their cost is likely to drop.

ARE SAFE HANDLING PRACTICES REQUIRED FOR IRRADIATED FOODS?

Food irradiation can reduce the risk of foodborne illness, but the process does not replace the need for 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. Bacteria from other foods can be carried to irradiated foods if care isn't taken to avoid cross-contamination. The following basic safe food handling practices are recommended for all foods, including irradiated foods.

Clean: Wash hands in hot, soapy water before preparing foods 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 pro-

ducts 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 °F; ground meat, 160°F; roasts and steaks, 145 °F; and poultry (whole bird), 180 °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 °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 to defrost foods. 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 too full. Cool air must circulate to keep food safe.

For more information on safe handling of foods, request HGIC 3500, *Basics of Safe Food Handling*.

SOURCES:

1. U.S. Food and Drug Administration (2000, Jan.). *Food Irradiation: A Safe Measure*. [www document]. URL <http://www.fda.gov/opacom/catalog/irradbro.html>
2. USDA Food Safety and Inspection Service (2000 May). *Irradiation of Raw Meat and Poultry Questions & Answers*. [www document]. URL http://www.fsis.usda.gov/OA/pubs/qa_irrad.html

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