



FOOD SAFETY RESEARCH: A FOCUS ON

Food Irradiation

Food irradiation, also known as cold pasteurization, is a food safety technology designed to greatly reduce disease-causing germs from food. It is the process of exposing food to high levels of radiant energy which penetrates into food, killing microorganisms without significant increases in the temperature of the food.

The treatment of food with ionizing radiation kills bacteria and parasites that cause foodborne diseases. The process of irradiation only complements proper food handling and storage. It does not replace it.

Studies performed by the World Health Organization, Food and Agricultural Organization, and International Atomic Energy Agency, determined there is no harm in the food itself or risk to the consumers. The food itself does not become radioactive. There may be some nutritional content changes, but no more so than with other processing methods such as cooking, canning, or pasteurization.

Irradiation cannot be used with all food. It can change the acceptability and palatability of certain foods, mostly those with high fat contents, such as higher fat dairy products. Some fruits such as peaches and nectarines may have tissue softening.

Currently in the United States, strawberries and other fruits in Florida are being irradiated. Tropical fruits coming from mainland Hawaii are being irradiated to replace the normal fumigation process. Beef, pork, poultry and many commercial spices are also being irradiated.

FSRIO Web site: A Resource for Food Safety Research Projects

For detailed information and descriptions of food irradiation related research projects, search the Food Safety Research database at:

<http://fsrio.nal.usda.gov/quicksearch.php>

The ARS National Program 108 Food Safety Annual Report 2005:

http://www.ars.usda.gov/research/projects/projects.htm?ACCN_NO=405880&showpars=true&fy=2005



As of 1999, the FDA requires the Radura Symbol to be displayed on Irradiated Foods sold for retail.

RESEARCH AREAS

Combining beneficial effects of irradiation and other ingredients to improve sensory characteristics.

Affects of Vitamin E on meat quality including odor and color after irradiation.

Radiation sensitivity of foodborne pathogens with foods of varying starting temperatures.

Reducing processing costs and improving consumer acceptance.

GENERAL FACTS

- Irradiation is measured in units called "Grays" (GY).
- The killing effect of irradiation on microbes is measured in D-values. One D-value is the amount needed to kill 90 percent of that organism.
- The FDA requires that all irradiated food carry the international symbol of the radura, and the statement "Treated with radiation" or "Treated by irradiation" on the packaging.
- Forty countries are permitting food irradiation, including: France, the Netherlands, Portugal, Israel, Thailand, Russia, China, and South Africa.
- The USDA estimates the American consumer will receive approximately \$2 in benefits such as reduced spoilage and less illness for each \$1 spent on food irradiation.
- Irradiation significantly reduces levels of pathogenic organisms including E. coli O157:H7, Cyclospora, Listeria, Salmonella, Campylobacter and Toxoplasma gondii on raw products.
- Food irradiation is applied to food products to control foodborne pathogens and insect damage; for preservation and sterilization; and to control sprouting and ripening.
- Food irradiation in the U.S is regulated as a food additive by several agencies, including the FDA and the USDA.

ONLINE RESOURCES

Center For Consumer Research, Food Irradiation

<http://ccr.ucdavis.edu/irr/index.shtml>

Frequently Asked Questions about Food Irradiation

<http://www.cdc.gov/ncidod/dbmd/diseaseinfo/foodirradiation.htm>

Irradiation Resources

http://www.fsis.usda.gov/Fact_Sheets/Irradiation_Resources/index.asp

Irradiation of Meat and Meat Products: Review of Risk Analysis Issues

<http://www.fsis.usda.gov/OA/topics/irrad-risk.htm>

Food Irradiation: A Safe Measure

<http://www.fda.gov/opacom/catalog/irradbro.html>

Irradiation: A Safe Measure for Safer Food

http://www.fda.gov/fdac/features/1998/398_irrad.html

Catch the Wave: Food Irradiation is Here

<http://www.iaea.org/icgfi/documents/catch-the-wave.htm>

Food Irradiation: Available Research Indicates That Benefits Outweigh Risks.

www.gao.gov/new.items/rc00217.pdf

FSIS Directive: Irradiation of Meat and Poultry Products

<http://www.fsis.usda.gov/OPPDE/rdad/FSISDirectives/7700-1.htm>

Food Irradiation, What is it?

<http://www.exnet.iastate.edu/Publications/NCR437.pdf>

Frequently Asked Questions about Food Irradiation

<http://www.mda.state.mn.us/dairyfood/irradiation.pdf>

Get the Facts about Food Irradiation

<http://www.gabeef.org/gbb/special/irradiation/questions.htm>



This fact sheet is one of several information products developed by the Food Safety Research Information Office (FSRIO) at the USDA's National Agricultural Library (NAL). Fact sheets on specific food safety research topics are available on the FSRIO web site at:

<http://fsrio.nal.usda.gov/topics.php>

FSRIO is a unique resource for the food safety research community. The program features a web site that serves as a gateway to research information and includes a database of federally-funded research projects. The database is available for researchers, policymakers, consumers and others to learn about research initiatives, and assist the government in assessing food safety research needs and priorities, thereby minimizing duplication of effort. FSRIO also provides a reference service at no charge.

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<http://www.nal.usda.gov>

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