

Texas Agricultural Extension Service

Irradiation of Raw Poultry

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Foodborne illness continues to be a widespread concern in the United States and around the world. Although thorough cooking will destroy any bacteria on poultry, improper handling and cooking of raw poultry can cause foodborne illness. Food spoilage and foodborne illness are caused by a variety of bacteria. In order to control bacteria on raw poultry, a rule was approved on September 21, 1992 by the U.S. Department of Agriculture (USDA) to permit irradiation of raw, packaged poultry. The rule allows packaged fresh or frozen poultry to be irradiated with the smallest, most practical dose of irradiation for bacterial control. This treatment makes poultry stay fresh longer and eliminates most of the bacteria that cause common foodborne illnesses. The Food and Drug Administration (FDA), and the Joint Expert Committee on Food Irradiation, made up of representatives from the World Health Organization of the United Nations and the International Atomic Energy Agency, agree that poultry irradiation is safe.

What is Irradiation?

Food irradiation is the process of exposing food to very high-energy, invisible light waves. Three types of high energy waves can be used in food irradiation. They are gamma rays, X-rays and electron beams. Just as X-rays do not make people radioactive, irradiation does not make food radioactive. Machines can generate both electron beams and X-rays. Gamma rays are produced by radioactive substances called radioisotopes. The most popular radiation source for food irradiation is the water-insoluble radioisotope cobalt-60. Both X-rays and cobalt-60 have been used extensively and safely by the medical industry to sterilize medical supplies.

During irradiation, prepackaged food is exposed to the energy source and the energy passes through the food. The energy destroys bacteria without cooking the food. Irradiation is not the same as microwave cooking. Microwave cooking heats food using low energy waves. Irradiation is a "cold

process" that does not significantly increase the temperature of the food being processed. Therefore, the food remains fresh and uncooked.

How Does Irradiation Help?

Foodborne illness is caused by bacteria such as *Salmonella*, *Listeria monocytogenes* and *Clostridium botulinum*. The Food Safety and Inspection Service (FSIS) branch of USDA estimates that irradiation of poultry with approved doses eliminates from 99.5 to 99.9 percent of the *Salmonella* organisms on treated food. Irradiation does not sterilize food because it does not eliminate all bacteria. Therefore, irradiated poultry still must be handled, refrigerated and cooked properly to prevent recontamination of the product or cross-contamination from other foods or food preparation surfaces.

Is Irradiation Currently Used in the U. S.?

Although irradiation has been approved for a variety of products in the United States, only irradiated spices and other seasonings are currently on the market. Irradiated strawberries, grapefruit and oranges have been successfully test marketed in the United States. Consumers like the longer shelf life irradiation gives these products.

What Types of Poultry Products Can Be Irradiated?

Currently the rule allows irradiation of retail and wholesale packages of fresh or frozen uncooked poultry such as whole birds, cut-up birds, ground poultry meat, hand-boned and skinless poultry products.

What are the Packaging Requirements?

Poultry must be packaged before it can be irradiated. The packaging material must prevent cross-contamination of the irradiated product by keeping out liquids and microorganisms. Air must be able to enter the package because an airtight package might allow *Clostridium botulinum* bacterial spores that may be present to activate and produce the toxin that causes botulism. Because irradiation does not destroy all of the bacteria, spoilage will still occur before the *C. botulinum* can produce enough toxin to make the product hazardous.

What are the Labeling Requirements?

Irradiated food products are labelled, not as a warning but as a source of information for consumers. All packages of irradiated poultry carry the green, international radiation sign, as well as the words "Treated with Radiation" or "Treated by Irradiation." The handling statement "Keep Refrigerated" or "Keep Frozen" also must be present. Only accurate and documented claims about irradiation, such as "Irradiated to Control Foodborne Bacteria," can be made.

What are the Benefits of Irradiation?

Irradiation can not be used on all foods, and it is not a miracle technique that will solve all food-related problems. When it can be used, however, irradiation treatment can significantly lower the risk of foodborne illness, delay spoilage and reduce chemical residues in foods by replacing some fumigants currently used. It decreases the risk of trichinosis from pork.

Irradiation adds little to the cost of poultry, and is part of an industry-wide, comprehensive program to reduce the microbial contamination of raw poultry.

The international food irradiation symbol has been established to designate food products which have been irradiated.



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