

# Food Irradiation

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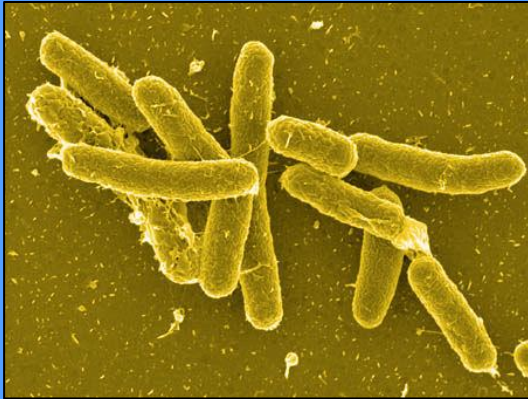
Food irradiation (the application of ionizing radiation to food) is a technology that improves the safety and extends the shelf life of foods by reducing or eliminating microorganisms and insects. Like pasteurizing milk and canning fruits and vegetables, irradiation can make food safer for the consumer.

The Food and Drug Administration (FDA) is responsible for regulating the sources of radiation that are used to irradiate food. FDA approves a source of radiation for use on foods only after it has determined that irradiating the food is safe.

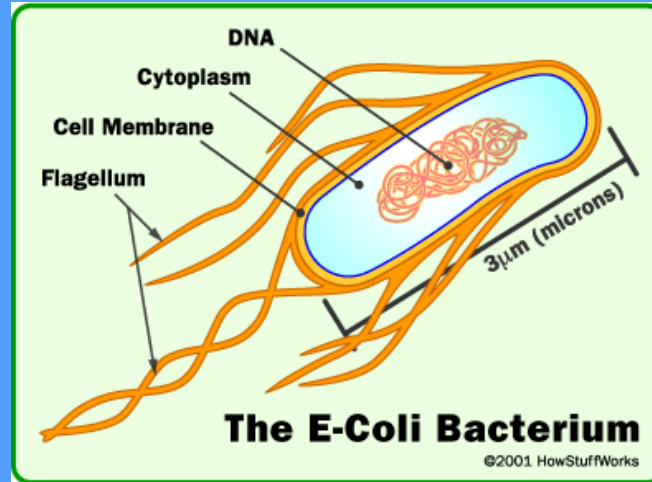
# Why Irradiate Food?

# Prevention of Foodborne Illness

irradiation can be used to effectively eliminate organisms that cause foodborne illness, such as *Salmonella*, *Helminth* and *Escherichia coli* (*E. coli*). 2-3 kGy(kilogray)



*Salmonella*



# Neam(แหนม)

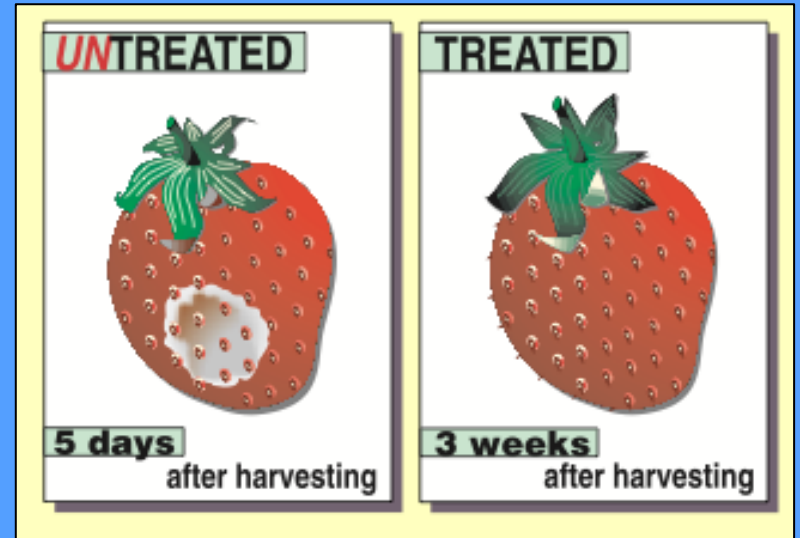
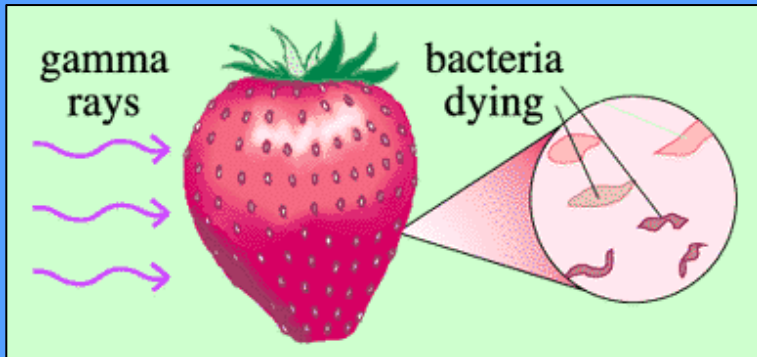
Example of prevent of food illness, Destroy parasites and microbes that cause disease.

Neam - The fermentation should provide a period of 1-3 days before the radiation doses of 2 kGy irradiation can be keep for 10 days at room temperature or 2 months at refrigerator temperature (5-20 Celsius).



# Preservation

irradiation can be used to destroy or inactivate organisms that cause spoilage and decomposition and extend the shelf life of foods.



# Control of Insects

irradiation can be used to destroy insects in or on tropical fruits imported. Irradiation also decreases the need for other pest-control practices that may harm the fruit.

The dose was about 0.2-0.7 kGy allowed up to 1 kGy, such as rice, beans, seeds, spices, dried fish.



Tamarind(มะขาม)

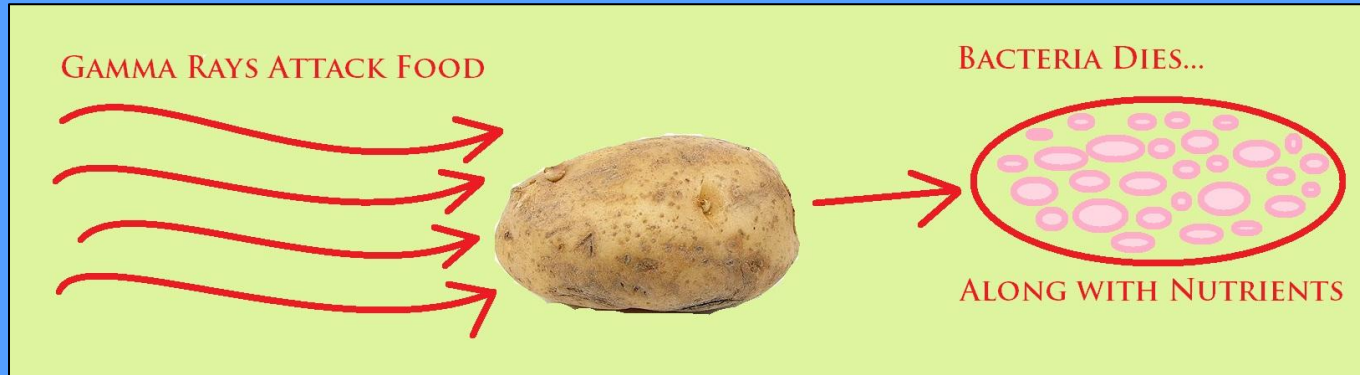


Mango

# Delay of Sprouting and Ripening

irradiation can be used to inhibit sprouting (e.g., potatoes) and delay ripening of fruit to increase longevity.

- Potato in snack food industry keep in temperature 10 - 15 ° C. ex potato chip, french fried
  - 0.08 - 0.15 kGy

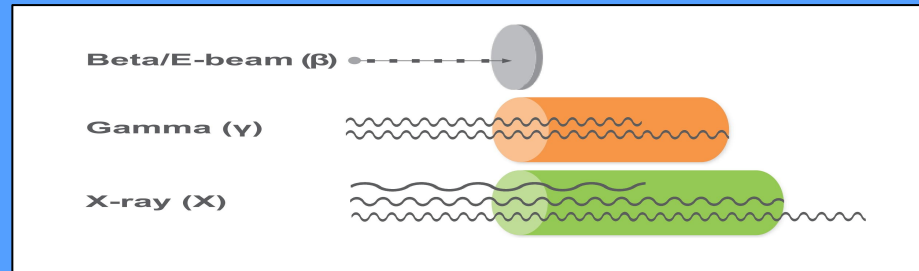




# How Is Food Irradiated?

There are three sources of radiation approved for use on foods.

- **Gamma rays** are emitted from radioactive forms of the element cobalt (Cobalt 60) or of the element cesium (Cesium 137). Gamma radiation is used routinely to sterilize medical, dental and household products and is also used for the radiation treatment of cancer.
- **X-rays** are produced by reflecting a high-energy stream of electrons off a target substance (usually one of the heavy metals) into food. X-rays are also widely used in medicine and industry to produce images of internal structures.
- **Electron beam** (or e-beam) is similar to X-rays and is a stream of high-energy electrons propelled from an electron accelerator into food.



# What Foods Have Been Approved for Irradiation?

FDA has approved a variety of foods for irradiation in the United States including:

- Beef and Pork
- Crustaceans (e.g., lobster, shrimp, and crab)
- Fresh Fruits and Vegetables
- Lettuce and Spinach
- Molluscan Shellfish (e.g., oysters, clams, mussels, and scallops)
- Poultry
- Seeds for Sprouting (e.g., for alfalfa sprouts)
- Shell Eggs
- Spices and Seasonings



# Is Irradiated Food Safe to Eat?

FDA has evaluated the safety of irradiated food for more than thirty years and has found the process to be safe. The World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC) and the U.S. Department of Agriculture (USDA) have also endorsed the safety of irradiated food.



# How Will I Know if My Food Has Been Irradiated?

FDA requires that irradiated foods bear the international symbol for irradiation. Look for the Radura symbol along with the statement "Treated with radiation" or "Treated by irradiation" on the food label. Bulk foods, such as fruits and vegetables, are required to be individually labeled or to have a label next to the sale container. FDA does not require that individual ingredients in multi-ingredient foods (e.g., spices) be labeled.



**Thank You**