

## Organic Consumers Association

# Our analysis of the FDA-sponsored pamphlet "Questions & Answers about Food Irradiation"

### TEXT OF THE PAMPHLET

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#### 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* and *Salmonella*. The process also controls insects and parasites, reduces spoilage, and inhibits ripening and sprouting.

**OCA Comment:** This statement is crafted to mislead the public. "Radiant energy" sounds like sunlight. In fact, irradiated food is treated with high-speed energy beams that, unlike sunlight, [ionize molecules](#). The free radicals caused by this "ionizing radiation" ricochet through the food and damage the DNA in bacteria, insects and the food itself. Free radicals are believed to be common cancer "promoters." That is, they promote the second-stage developments that turn the initially damaged cells into malignant (i.e., cancerous) ones. Microwaves do not harm the food in the same way as irradiation. In microwaving, food is cooked by heating the water in the molecules; the DNA in the food is not broken. Ionizing radiation includes gamma rays from nuclear materials, electrons from electron guns, and x-rays.

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#### Is irradiated food safe?

The Food and Drug Administration has evaluated the safety of this technology over the last 40 years and has found irradiation to be safe and has approved its use for many foods. Scientific studies have shown that irradiation does not significantly reduce nutritional quality or change food taste, texture or appearance. Irradiated foods do not become radioactive. American astronauts have eaten irradiated food since the 1970s and patients with weak immune systems are sometimes fed irradiated foods to reduce the chance of infection.

**OCA Comment:** There are many errors and omissions here.

- First, the pamphlet implies erroneously that the FDA has both continuously evaluated scientific studies over the last 40 years, and and found a uniform record of safety. See our section on [Food Irradiation Resources](#) for the numerous problems and deficiencies in the FDA's review of the science.

- Second, the statement implies that FDA has found irradiation to be safe for ALL foods. In fact, in 1968 the FDA retracted its 1963 approval of bacon, because animals fed irradiated bacon showed health effects.
- Third, irradiation DOES reduce nutritional quality. Even people who support irradiation agree that vitamins are lost, particularly the antioxidant vitamins A, E, C, and K, which are necessary to counteract free radicals. The amount of vitamin loss varies with the food and the length of storage, so whether this is "significant" or not depends on the food, its importance in a person's diet, and whether people get the vitamin from other foods. The FDA has not stated what its "baseline" diet consists of. Children in particular may eat large quantities of the same food, and vitamin loss in this food could be "significant". In poor countries where staple crops like wheat or potatoes could be irradiated, the problem of vitamin loss would be very significant.
- Fourth, it is likely that the natural digestive enzymes in food are significantly damaged. Enzymes are long proteins, and are affected by the free radical 'fragmentation bombs' created by irradiation. The presence of enzymes is the most critical nutritional difference between raw food and cooked food. Irradiated food that is meant to be eaten raw is a danger to public health, and, when unlabeled, a deliberate fraud to the consumer.
- Fifth, the FDA is simply lying when it says irradiation "does not change food taste, texture or appearance." Many studies have shown that irradiation can produce such changes. For example, irradiated ground beef can have the aroma of a wet dog, and irradiated melons can be mushy. To combat these problems, food scientists manipulate the irradiation dose and other variables, such as packaging, to produce an 'acceptable' food. Foods with a "low tolerance" for irradiation are simply not irradiated. Irradiated fats easily become rancid because the free radicals oxidize the fats. For this reason, fatty foods are irradiated only if they are likely to be cooked, or used within a short time.
- Sixth, induced radioactivity IS possible at 10 Mev (the maximum permitted dose for fruits and vegetables), but diminishes during storage.
- Seventh, the statement about astronauts is irrelevant. They are military people on a military mission who expect to be exposed to greater risks than the civilian population, and their 'acceptance' of irradiated food should be seen as part of their acceptance of that risk.

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### **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, pathogens and insects. The food is left unchanged, but the number of harmful bacteria, parasites and fungi is reduced. (The food irradiation symbol, the radura, is required by the FDA on all irradiated food with the words "treated with radiation" or "treated by irradiation".)

### **OCA Comments:**

- First, again, the FDA misleads the public by using the term "radiant-energy source" instead of "ionizing-energy source".

- Second, the FDA does not mention that energy waves passing through the food ALSO break molecular bonds in the food itself.
- Third, an outright lie: the food is NOT "left unchanged." Irradiation creates free radicals, damaged DNA, damaged vitamins and enzymes. It is impossible for energy waves to break the DNA of bacteria and insects, and NOT break the DNA of the food itself!
- Fourth, an extremely misleading statement that verges on a lie--the assertion that all irradiated food is labeled. The consumer who reads this thinks that they will always know if their food has been irradiated. Not true! Yes, all irradiated food is labeled--but only to the first purchaser, which can be a restaurant, school, hospital, airline or food processor. None of these institutions or companies are required to label irradiated food to the consumer. In addition, when consumer labels ARE required (e.g., on a bag of potatoes), the required wording may be as small as the typeface on the ingredient label, and can be on the back of the package. Produce sold by the piece is supposed to be labeled on the display or on the fruit itself, but there is no enforcement and no specific size for the display label. Consumers are NOT adequately notified by existing labeling requirements. And food industry groups have been pressuring Congress to require the FDA to remove ALL labels.

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### **Do irradiated foods cost more?**

Irradiated products cost slightly more than their conventional counterparts. Some industry experts estimate the cost at two to three cents higher per pound for fruits and vegetables and three to five cents higher 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, Food trade groups say that as irradiation becomes more common, the cost is likely to drop.

**OCA Comments:** Irradiated ground beef in Minnesota has recently sold for up to \$1.50/lb. more than nonirradiated beef. Nobody has a crystal ball, but we can be sure that as long as irradiated food can be promoted as "better" than nonirradiated food, the price will be as high as the traffic will bear.

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### **Are food irradiation facilities safe?**

Both the electron beam and gamma ray technologies used today are safe. The electron beam facilities, like the one at Iowa State University, use an electron generator to produce a stream of high-energy electrons to form the electron beam. E-beam technology has been used for the last 15 years. The technology to produce gamma rays used Cobalt 60 or Cesium 137. Both are radioactive materials that do not give off neutrons, which means that this material does not make anything around it radioactive. This technology has been used routinely for more than 30 years to sterilize medical, dental and household products.

**OCA Comment:** Gamma-ray facilities, which use nuclear materials, are inherently unsafe. There have been numerous spills and leaks of radioactive material and worker exposures from irradiation facilities worldwide. The statement that this technology is used "routinely" is irrelevant.

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## Are irradiated foods available?

Irradiated food is becoming widely available. Some stores have sold irradiated fruits and vegetables since the early 1990s. Irradiated meat is available in some grocery stores and on menus in a few restaurants. Some spices also are irradiated to control pests.

**OCA Comment:** Because irradiated food that is sold in restaurants is not labeled to the consumer, no one except the packer knows how much irradiated meat/poultry is being sold. Companies that produce over 75% of the U.S.'s 9 billion pounds/year of ground beef and approximately 50% of the nearly 35 billion pounds/year of poultry have already signed agreements to use irradiation technology. Ground beef and chicken will be the most commonly irradiated foods.

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## What kind of machine irradiates food?

In electron beam irradiation, food is irradiated by a machine called a linear accelerator. A linear accelerator generates electrons, similar to a television tube, that are accelerated, bent and scanned over the product. No radioactive material is used. Iowa State University houses a commercial-sized electronic beam irradiator in the Linear Accelerator Facility pilot plant. The machine is similar to those used throughout the country to irradiate food products and medical products. Food also can be irradiated through a process using gamma rays produced by a safe radioactive source, such as cobalt. Another process is being developed using X-rays to irradiate food.

**OCA Comments:** Nuclear materials are inherently unsafe. The unnamed nuclear material "such as cobalt" is cesium-137, a byproduct of nuclear energy production. It is much more toxic and has a longer half-life than cobalt-60. The U.S. Department of Energy has pushed food irradiation for 20 years in order to sell off their pile of dangerous cesium-137. If e-beam irradiation paves the way, cobalt-60 and cesium-137 will be used for food irradiation, because the energy source is not listed on the label. In addition, electron-beams can only be used for thin, evenly sized foods like burger patties. Larger foods like whole turkeys must be irradiated with either x-rays or gamma rays from nuclear material. If irradiation is popularly accepted, the DOE will be only too happy to supply cesium-137 at cut-rate prices to irradiate foods.

Furthermore, meat that is "treated" by an e-beam accelerator receives the radiation equivalent to 1.4 billion television sets.

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## What foods can be irradiated?

- meat
- grains
- fruits and vegetables
- dehydrated fruits and vegetables
- spices
- seasonings

- other non-food uses for irradiation include sterilizing medical products, such as surgical gloves, destroying bacteria in cosmetics, and purifying wool.

**OCA Comments:** In addition to the above list, shell eggs were approved by the FDA in 2001 for irradiation. A coalition of food industry groups has asked the FDA to approve luncheon meats, prepared fresh foods (e.g., salad bar items), seeds, fresh juices, sprouts and frozen foods. The FDA hasn't ruled yet, but they will probably use the same science as 15 years ago to approve these foods. If they approve, the only common foods NOT approved for irradiation would be: seafood, dairy (which is pasteurized), honey, coffee, chocolate and oils (fats become rancid easily because of the free radical creation, so they won't be irradiated if they could be eaten raw). Baked goods and dried legumes don't need irradiation. That's about it! Most of our diet could be irradiated!

### **Where can I get more information?**

More information about food irradiation and the Linear Accelerator Facility at ISU is available online at: [www.extension.iastate.edu/foodsafety/rad/irhow.html](http://www.extension.iastate.edu/foodsafety/rad/irhow.html)  
To request irradiation services, contact the ISU Meat Lab at (515) 294-6329, or 194 Meat Laboratory, Iowa State University, Ames, IA 50011-3150.

**END OF TEXT OF THE FDA PAMPHLET**

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