Food Irradiation: Australia and Beyond

From Narangba to the Cold War and Back

Executive Summary

Released in conjunction with the National Food Irradiation Awareness Tour and International Anti-Food Irradiation Week

Public Citizen

Energy and Environment Program

Washington, D.C., USA

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Prepared by Mark Worth
Research Director

This document can be viewed or downloaded at www.citizen.org/cmep

Public Citizen
215 Pennsylvania Ave., S.E.
Washington, D.C. 20003
tel: (1) (202) 546-4996
fax: (1) (202) 547-7392
cmep@citizen.org
www.citizen.org/cmep

Public Citizen, founded by Ralph Nader, is a non-profit research, lobbying and litigation organization based in Washington, D.C. Public Citizen advocates for consumer protection and for government and corporate accountability, and is supported by more than 150,000 members throughout the United States.

Executive Summary

The battle of Narangba, where a cobalt-60 food irradiator recently opened, has introduced a new element to Australia and New Zealand's vigilant struggle against things nuclear.

Food irradiation is an emerging international issue that, try as one might, cannot be distilled into sound-bites. To understand it means to have a grasp of related issues that do more than just put food irradiation into perspective, they explain its very existence.

Food irradiation is a process by which food is "treated" with high-energy ionizing radiation in the form of gamma rays from radioactive cobalt-60, X-rays, or electron beams. Irradiation was largely inspired by U.S. President Dwight Eisenhower's "Atoms for Peace" speech to the United Nations in 1953, in which he proclaimed that "the miraculous inventiveness of man shall not be dedicated to his death, but consecrated to his life."

As is often the case with scientific advancement, irradiation was a solution looking for a problem. With their short wavelengths and high frequencies, gamma and X-rays have the triple-threat ability to eliminate bacteria, extend shelf life, and kill invasive pests – by disabling everything in their path.

Excitement from nuclear physicists – not so much from food scientists – built seemingly forever to the point that irradiation is now legal in about 60 countries, including Australia and New Zealand. The United States, a leader of the irradiation movement since the beginning, now allows irradiated ground beef to be fed to schoolchildren.

Yes, irradiation works, to the extent that at high enough doses it can kill most food-borne bacteria, though enough survive to warrant concern. It can extend shelf life of meat and produce, though your pork might look a little red and your strawberries may be mushy, and they'll both be vitamin depleted. And it can kill or sterilize fruit flies, weevils and other invasive pests, though some critters might slip through still fertile.

Under a closer look, the downsides of food irradiation quickly appear.

A lot can happen to food that, in the case of frozen beef, has been dosed with ionizing radiation equal to 233 million chest X-rays – all at once.

Given the counterintuitiveness of placing food and radioactivity near each other, it should come as no surprise that mice, rats, monkeys and other lab animals fed irradiated foods have experienced a variety of unpleasant health problems, including premature death, mutations, fetal death and other reproductive problems, immune system disorders, fatal internal bleeding, organ damage, tumors, stunted growth and nutritional deficiencies.

In contrast to false claims by governments and the industry, irradiation significantly alters the composition of food. Radiation cannot kill bacteria while dancing around food molecules and leaving them unaltered. Chemicals have been found in irradiated foods that do not occur naturally in any foods. Called 2-alkylcyclobutanones, or 2-ACBs, these compounds have been linked to cancer development in rats and genetic damage in human cells.

Many other harmful chemicals are formed by irradiation, including several known or suspected to cause cancer and birth defects, such as benzene and methyl ethyl ketone.

Irradiation also destroys vitamins – up to 80 percent of vitamin A in eggs and 48 percent of beta carotene in orange juice. Protein, essential fatty acids and other nutrients are disrupted.

Further, irradiation masks the filthy conditions in slaughterhouses and food processing plants that cause meat to be contaminated with food-borne pathogens. Irradiation does nothing to remove the feces, urine, pus and vomit that often contaminate beef, pork, chicken and other meat. People do not want to eat feces, whether it's been irradiated or not.

Moreover, several deaths and numerous injuries have occurred at irradiation facilities throughout the world. Dozens of mishaps and acts of misconduct have been reported, some of which have led to criminal convictions of company executives.

In the face of life-threatening risks, U.S. government and corporate scientists have not given up on irradiating food with cesium-137, an extremely high-level radioactive waste generated by the manufacturing of nuclear bombs during the Cold War.

Irradiation also has the potential to cause profound economic and social effects.

Because it can increase the shelf life of food and utilize centralized facilities, irradiation will likely further stimulate the globalization and consolidation of food production, distribution and retailing. Due to these existing trends, multitudes of family farmers and ranchers have been forced out of business, product diversity has been reduced, and rural economies have been disrupted.

Australia and New Zealand recently joined the community of nations that, officially speaking, see a big future in irradiated foods. A 10-year moratorium was lifted in 1999. Since then, the government has legalised irradiation for tropical fruit, herbs and spices, and has approved an irradiation facility near Brisbane that uses radioactive cobalt-60. Protesters maintained a ten-month vigil at the facility, which opened in July 2003.

The government and the industry speak of irradiation as a way to expand overseas markets for tropical fruit that serve as hosts for fruit flies, weevils and other invasive pests. Irradiation, they say, will take care of this problem with one quick zap.

But Australia might have a much bigger problem on its hands.

Over the past decade, the federal government has transferred much of the responsibility to ensure the safety of the meat supply from government inspectors to "quality assurance officers" hired by private corporations. Predictably, many of the results have been discouraging if not disgusting.

Feces contaminates up to three-fourths of carcasses at some slaughterhouses. Head meat covered with feces now regularly goes into meat pies, as does old "black" meat. Pools of bloody, red fecal soup lie on the floor. Bile, urine and pus fly all over the place, and onto workers, many of whom don't change clothes one day to the next.

Fat, rotting meat, blood and grease accumulate on infrequently cleaned equipment. Facilities are covered in greenish-black mold, swarming with flies and infested with rats – in the case of rats, because the government stopped providing baited traps.

Standards have dropped so low that some facilities that slaughter horses and donkeys for pet food are cleaner than meatworks producing food for people. As a result, several large-scale food poisoning outbreaks have occurred.

Irradiation can kill *E. coli*, *Salmonella*, *Listeria* and other food-borne bacteria common in meats. As of today, however, the irradiation of meat is not legal in Australia or New Zealand. There has been virtually no public talk about irradiating meat. But unless the makers of contaminated meat have an epiphany and start placing quality before quantity, the industry may turn to irradiation – a band-aid at best – to solve their bacteria problem. This could lead to the worst of both worlds: a meat industry unwilling to clean up its operations, and a populace increasingly exposed to dirty meat.