

## ***FROM NUCLEAR BOMBS TO FOOD SAFETY: A PERSONAL ODYSSEY***

Larry J. Gordon, Adjunct Professor, University of New Mexico  
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The public attitude about irradiation of food has improved considerably. However, reinforced by media misinformation and visions of Hiroshima, many conjure up images of a mushroom cloud when they think of radiation. But most people now consider the many benefits that properly controlled radiation brings to society. The term “gnosophobia” has been used to describe the disease of “fear of the unknown” or “fear of intellectual knowledge” regarding those who continue their efforts to prevent any beneficial use of radiation. Americans have a love affair with calamities and many are more eager to believe the latest alleged catastrophe of the week than the latest scientific evidence.

We have learned a lot about the dangers and the benefits of radiation since the first atomic detonation at Trinity Site in New Mexico some 54 years ago. I became intimately aware of the awesome power and danger of radiation at an early date. As a U.S. Public Health Service Commissioned Officer, I monitored fall-out from nuclear devices (we were cautioned not to call them bombs) at the Nevada Test Site in the 1950s. I witnessed many “shots” (we did not call them explosions) both on-site and off-site. The one I best remember was Project Hood, the largest nuclear device ever detonated within the continental United States. I was standing alone in the darkness some 100 miles from ground zero and could have read newspaper print illuminated by the awesome light of the fireball.

In the 1960s, I was assigned to monitor a peace time underground “shot” termed Project Gnome near Carlsbad, New Mexico. This was a part of the Plowshare series for peaceful uses, so termed from the biblical adage of *beating swords into plowshares*. We had been assured that the Gnome shot was designed to prevent venting into the atmosphere. At the count-down, the experiment vented not far from a large crowd where nuclear scientist Dr. Edward Teller was serving as the MC. The press turned to him, and inquired “what is that vapor”, to which he allegedly replied in great scientificese, “It looks like white vapor.” We had a Public Health Service helicopter hovering over the site and the “white vapor” promptly caused all its monitoring instruments to go off-scale. The “white vapor” plume subsequently drifted across a nearby highway and doused a few vehicles, including a CBS News vehicle. Two of us tracked the plume about a hundred miles up through the Hondo Valley the rest of that day and night to monitor and report radiation levels.

As Director of the Albuquerque Health Department some 40 years ago, I noted the continued use of shoe-fitting fluoroscopes that provided the opportunity for children, adults and salespeople to stand, stare and be exposed to large doses of direct and scattered radiation while viewing the bones in their feet. I ordered all shoe stores to

dispose of the machines. Even though I had no specific statutory support, they were all gone within a few days.

While I was New Mexico Cabinet Secretary for Health and Environment, I was deeply involved in the issues dealing with the Federal Waste Isolation Pilot Project. The facility should have opened 10 years ago but, due to delaying tactics, it finally received its first shipment of transuranic wastes only a few months ago. Some activists were insisting on “zero risk”, which is never attainable.

And one more experience relating to the potential horrors of radiation: I happened to be leading a public health tour in the Soviet Union at the time of the 1986 Chernobyl nuclear incident. Of course we didn't officially hear about it until returning to the United States as the Soviets assumed we had no “need to know.”

I have mentioned the foregoing to emphasize that radiation has been both used and misused.

And now, to discuss some of the safe and beneficial food safety aspects of irradiation.

Protection of our meat supply is an important public health issue. When I supervised our state's food protection activities in the early 1950s, I gave considerable thought to various methods of improving the safety of our food supplies. I envisioned having mobile irradiation units that would visit our various slaughterhouses and other meat processing facilities to make the public health benefits of irradiated meat available to consumers. This ranked among a number of my ideas whose time has not arrived. Later, I supervised a comprehensive meat inspection program when I was Director of the Albuquerque Health Department. This experience provided me with additional insight into the practices and problems of the meat industry.

We have successfully used pasteurization and chlorination which, while once controversial, are now accepted as basic public health protection measures. Irradiation should be an important addition to, not a substitute for, our arsenal of food protection methodologies.

As you know, irradiation of food is the use of ionizing energy to eliminate hazards in food and delay spoilage of food. The process does not make the food radioactive, and has little or no effect on flavor. Irradiation essentially pasteurizes food with short-wavelength gamma rays or X-rays that pass through the food. It can delay the spoilage of highly perishable fresh fish and shellfish, reduce the number of microorganisms in spices, destroy some types of disease-causing bacteria and parasites, and extend the shelf-life of various fruits by delaying mold growth. Irradiation would facilitate the interstate and international shipment of fruits and vegetables. Irradiation of fresh meat and poultry can contribute to better health and nutritional status. Treatment by ionizing radiation is being more widely used to **supplement** other technologies for certain applications. Food irradiation may be one of the most significant contributions to public health to be made by food science and technology since the introduction of pasteurization. Irradiation has

been studied more extensively than any other food protection process. The U.S. Department of Agriculture estimates that consumers will receive \$2 in benefits such as reduced spoilage and decreased illness for each \$1 spent on food irradiation.

The preferred irradiation source, Cobalt 60, has a relatively short half-life and decays quickly when its useful life is over. When machine sources of irradiation such as X rays are used, there is no radioactive waste. There is no link between irradiated foods and nuclear weapons production.

Food irradiation has been endorsed by an ever increasing number of national and international health and scientific organizations. Dozens of countries have approved specific applications of irradiation to further safeguard their food supplies. The scientific literature supports the fact that properly irradiated food can be considered safe, wholesome and nutritionally adequate. Irradiation should not be considered a substitute for basic food protection measures, and **must not be used as a cover up for filth and poor food sanitation practices**. Unlike chlorination, irradiation does not leave a protective residual. Each potential application must be determined individually, and the applications must be accompanied by continuing research and surveillance to insure there are no deleterious effects or undesirable side effects. Irradiation of meat or other foods is not a panacea.

Internationally, food-borne illnesses constitute one of the most widespread threats to human health, and are a significant cause of reduced economic productivity. Thousands of cases of food-borne illness could be prevented by irradiating meat and poultry and meat and poultry products.

Several companies have been forced to recall their luncheon meats and hot dogs in recent months due to possible contamination. One company had to recall 15 million pounds of hot dogs and lunch meats after products were linked to 100 illnesses in 22 states, as well as 15 deaths and six miscarriages or stillbirths.

The U.S. Food and Drug Administration has approved irradiation to control microorganisms on fresh and frozen poultry, beef, lamb and pork. Irradiated foods must exhibit the international symbol for radiation. The Food and Drug Administration should also require a statement that the food has “been irradiated to protect your health.”

Within the past few months, the Food Safety Commission established by Congress in 1988 to investigate meat and food safety, recommended that irradiation approval for uncooked meats should be expanded to include ready-to-eat products like hot dogs and luncheon meats. In August of this year, a coalition of health organizations, food industry groups, academic and consumer groups filed a petition asking the Food and Drug Administration to extend the use of food irradiation for ready-to-eat meat and poultry products and for fruit and vegetable products.

Studies have shown that the public will purchase irradiated foods when properly informed of the benefits. Specific applications of irradiation of foodstuffs are important

public health measure. Widespread adoption of food irradiation will benefit public health and allow consumers the **choice** of food irradiated for safety as an important step in *beating swords into plowshares*.