EDITORIAL

Food Irradiation—Promising Technology for Public Health

There are clear signs, both from the food industry and the consumer, that the seemingly entrenched resistance to the irradiation of food may be dissipating. For too long now, this relatively simple procedure to eliminate insects from imported foods, prevent potatoes from sprouting, and control disease-spreading micro-organisms has been languishing in disuse—an ironic situation for a nation that prides itself on scientific know-how and "can do" spirit.

Food irradiation has been endorsed by such diverse bodies as the World Health Organization, the U.S. Department of Agriculture (USDA), the National Food Processors Association, the American Council on Science and Health, several university-based food research institutes, and our own Food and Drug Administration (FDA) (*1–9*).

Moreover, according to the National Food Processors Association, 36 other countries have given various clearances for the processing of some 50 food items.

Yet in many of these countries, including the United States, use of the process has been limited. In America, the only extensive use of food irradiation has been to kill insects or bacteria on spices and seasonings, even though it has been legal since 1986 for other foods such as fresh fruits and vegetables. Pork irradiation was approved in 1985 but has never gone into commercial use (*6*).

The technology involves exposing food to electron beams, X-rays or gamma rays from radioactive cobalt or cesium. Absorbed radiation is measured in units called Grays. The irradiation dose in Grays refers to the level of energy absorbed by a food from ionizing radiation that passes through the food in processing. One thousand Grays equal 1 kiloGray (1 kGy).

The Codex Alimentarius Commission, the United Nations group that sets international food standards, has concluded that irradiation levels up to 10 kiloGrays constitute no toxicological hazard and introduce no special nutritional or microbiological problems (*1*). U.S.-permitted food irradiation doses are below 10 kiloGrays, for example, 1 kiloGray for fresh fruits and 3 kiloGrays for poultry (*7,8*). The only exception is dry or dehydrated aromatic substances, like spices or seasonings, which may receive up to 30 kiloGrays. This dose level is permitted because these items are used in small amounts that make no nutritional contribution to the human diet.

Nevertheless, a few highly vocal opponents have cited discredited reports and repeated outlandish fears often enough to make some consumers think twice.

Does the process, as the opponents say, make food radioactive? . . . cause cancer or birth defects? . . . rob food of vital nutrients?

The facts say no. More than 40 years of research involving literally hundreds of studies plainly demonstrate that

- Foods processed with radiation using the permitted sources do not become radioactive, just as we know people do not become radioactive from chest X-rays.
- While alarmists say substances called radiolytic products produced in foods during irradiation may be harmful, these substances are identical or similar to substances that occur naturally in food that is not irradiated. They are harmless in the amounts produced during irradiation at the permitted doses.
- Nutrient loss during approved levels of irradiation is negligible.

Food irradiation can be compared with pasteurization in its promise for the public health. Not only does the technology extend the shelf life of produce by inhibiting ripening or sprouting, it kills or renders noninfective many harmful food-borne organisms—*Vibrio* in seafood, *Trichina* in pork and *Salmonella* in poultry. We have an epidemic of cholera sweeping the Americas and an epidemic of *Salmonella* poisoning from eggs and poultry in this country.

The Centers for Disease Control of the Public Health Service, noting that *Salmonella* illnesses in

the United States are vastly underreported, estimates that the actual number is between 800,000 and 4 million cases a year (*10*).

Juxtapose that statement with this 1991 USDA finding: permitted doses of radiation can be expected to kill between *99.5 and 99.99 percent* of *Salmonella* micro-organisms on a poultry carcass (*3*). Irradiation is no substitute for proper handling, storage, and cooking of poultry and other food, but its role in this situation is obvious.

FDA approved irradiation for raw chicken, turkey, and other poultry in May 1990 (*8*). Implementing regulations have been written by USDA and are expected to become final in 1993.

There are promising signs that some poultry groups are ready to adopt the technology. And a request to permit seafood irradiation is under review at FDA.

In January 1992, the nation's first facility designed specifically to irradiate food opened near Tampa, FL. One store owner bought treated strawberries, and press reports say shoppers lined up early for the first day's sale. By late afternoon they had purchased 500 pints. I have tasted strawberries from this plant, and they were delicious!

And a 1989 USDA Economic Research Service survey indicated that 66 percent of consumers would even be willing to pay a higher price for chicken with *Salmonella* levels greatly reduced by irradiation, and 18 percent would pay the same price. Only 14 percent said they would not buy irradiated chicken at all (*11*).

So we also have indications that much of the public has begun to listen to the facts about food irradiation. This public deserves a choice.

FDA has ruled that irradiated products must be clearly labeled as such and bear the international "radura" sign. Those who are not interested in them simply do not have to try them.

Will food irradiation be as important as pasteurization? I like what FDA scientist George Pauli says of that: "It's hard to claim that kind of scientific victory until these products have been widely marketed and their influence on illness evaluated. But there's no doubt that the potential for a major benefit is there."

The bottom line on food irradiation is that the nation deserves to have—and should claim—the health benefit this technology will surely provide. We don't know how great that benefit will be—but we do know it will be significant.

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