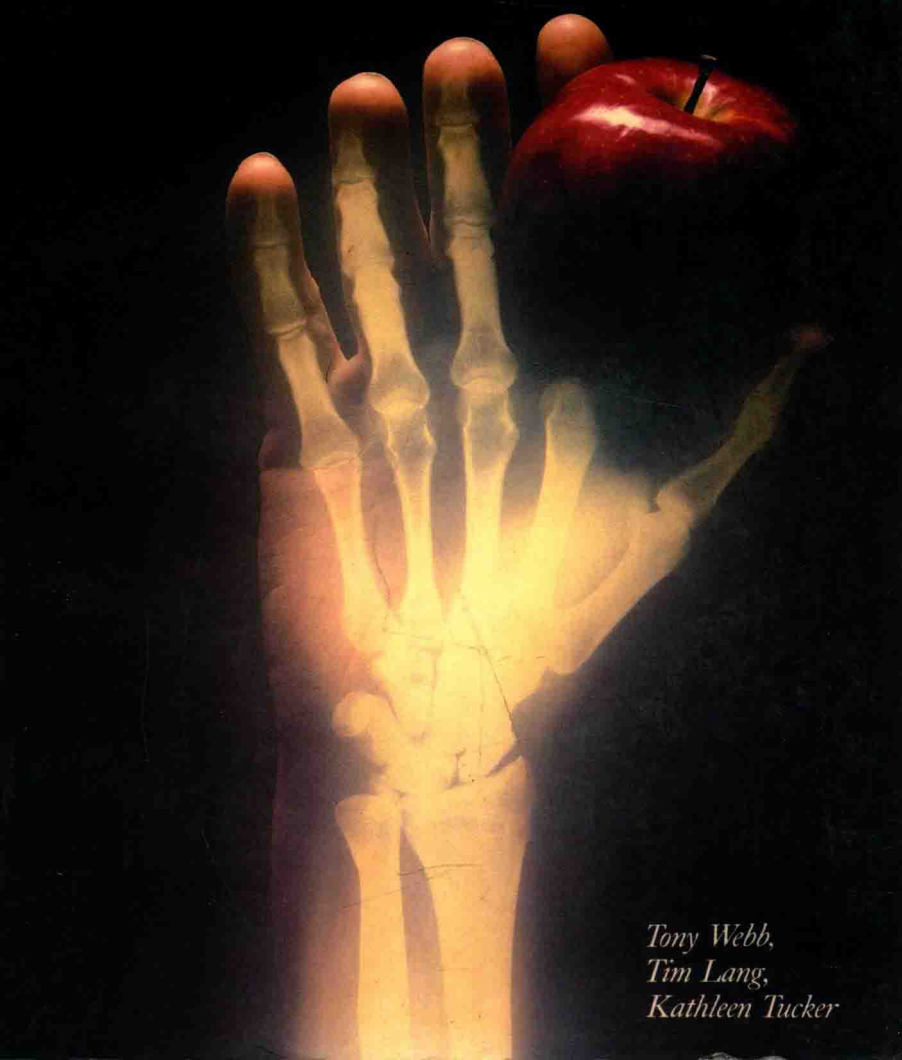
FOOD IRRADIATION

WHO WANTS IT?



Tony Webb,
Tim Lang,
Kathleen Tucker

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Tony Webb, Tim Lang, and Kathleen Tucker

With a forward by Michael Jacobson, Director
Center for Science in the Public Interest

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GLOSSARY

ACINF: Advisory Committee on Irradiated and Novel Foods

AFL/CIO: American Federation of Labor and Congress of Industrial Organizations

BARC: Bhaba Atomic Research Centre (India)

BEUC: Bureau European des Unions de Consommateurs

CAIR: Citizens Against Irradiated Food (US)

CANAH: Coalition for Alternatives in Nutrition and Healthcare (US)

Co 60: Cobalt 60: radioactive isotope for food irradiation

Cs 137: Cesium 137: radioactive isotope for food irradiation

COMA: Committee on Medical Aspects of Food Policy (DHSS) (UK)

CUFFS: Consumers United for Food Safety

DHSS: Department of Health and Social Security (UK)

DOE: Department of Energy

ECF-IUF: European Committee of Food Catering and Allied Workers Unions within the International Union of Food Workers

EEC: European Economic Community

EHO: Environmental Health Officer (UK)

EIS: Environmental Impact Statement (US)

FAO: Food and Agriculture Organization (United Nations)

FAST: Food and Allied Services Trades Department of the AFL/CIO

FDA: Food and Drug Administration (US)

FDF: Food and Drink Federation (UK)

FIR: Food Irradiation Response (US)

FIRA: Food Industries Research Association (at Leatherhead, Surrey) (UK)

Gy: Gray: unit of received dose of radiation

HEI: Health and Energy Institute, Washington, DC

HHS: US Government Department of Health and Human Services

IAEA: International Atomic Energy Agency

IBT: Industrial Bio-Test Ltd.

ICRP: International Commission on Radiological Protection

IOCU: International Organisation of Consumers Unions

JECFI: Joint Expert Committee of the IAEA/WHO/FAO

kGy: kiloGray

LFC: London Food Commission (UK)

MEP: Member of the European Parliament

MP: Member of Parliament (UK)

mSv: milliSievert (see Sievert, below)

NACNE: National Advisory Committee for Nutrition Education (UK)

NCSFI: National Coalition to Stop Food Irradiation (US)

NIN: National Institute of Nutrition (Hyderabad, India)

OMB: Office of Management and Budget (US)

PA: Pubic Analysts (UK)

PUFA: Polyunsaturated Fatty Acid

Rad: old unit of received dose of radiation

Radurization: use of "low" doses (below 100,000 rad) (1 kGy)

Radicidation: use of "medium" doses (100,000-1 million rad) (1-10 kGy)

Raddapertization: use of higher doses (above 1 million rad) (10 kGy)

RDA: Recommended Daily Allowance (for vitamins)

rem: unit of dose measuring biological damage

Sv: Sievert: new unit of dose measuring biological damage done in living tissue

UK: United Kingdom

UN: United Nations

US: United States

USDA: United States Department of Agriculture

VAPOF: Vermont Alliance to Protect our Food

VPIRG: Vermont Public Interest Research Group

WHO: World Health Organization (of the United Nations)

CHRONOLOGY

1916 Sweden experiments with irradiation of strawberries.

1921 Patents taken out in US.

1930 Patents taken out in France.

1953 Food irradiation to be one of the "atoms for peace" technologies; US Army begins research.

1957 Irradiation used on spices in West Germany.

1958 Food irradiation banned in West Germany.
USSR permits irradiation of potatoes.
US: Irradiation classed as an additive; safety testing required.

1960 Canada permits irradiation of potatoes.

1963 US permits irradiation of wheat, potatoes, and bacon.

1968 US FDA withdraws permit for bacon.
US Army studies found to indicate adverse effects and to have been poorly conducted.

1970s Research program taken over by IBT Ltd.
IAEA organizes "expert seminars" and publishes reports on food irradiation.
IAEA sets up joint expert committee with WHO and FAO (JECFI).

1976 JECFI relaxes requirement for testing of irradiated foods so that radiolyte products do not have to pass tests normally required for food additives. Further permits for foods given by various countries.

1981 JECFI gives general clearance up to 1 million rad (10 kGy) (average dose) and removes requirement for control of maximum and minimum doses.
UN Codex Alimentarius process initiated.
Permits extended by various countries.
US FDA publishes proposals for fruits, vegetables, spices, and pork.

1982 UK Government ACINF set up to review evidence on safety and wholesomeness.
Codex Alimentarius Commission adopts JECFI proposals for general clearance up to 1 million rad (10 kGy).

1983 IBT officials convicted of doing fraudulent research for government and industry. US loses $4 million and 6 years of research data.

1984 US FDA publishes proposals to eliminate labeling of irradiated foods.

1985 US DOE proposes spending $10 million to build six demonstration irradiation plants. Offers cesium 137 at one-tenth of market price of cobalt 60.
US FDA gives clearance to irradiation of pork for control of trichinae.

1986 Scandal over abuse of irradiation by British food companies illegally concealing bacterial contamination on imports to UK and Sweden.
US approves clearance of irradiation for fruit and vegetables up to 100,000 rad (1 kGy) and 3 million rad (30 kGy) for spices.
UK ACINF report published: recommends there are no special safety problems from irradiation of food up to 10 kGy.

1987 European Parliament votes against general approval of irradiation for European Community "on precautionary grounds" and instructs the European Commission to investigate alternative methods of preservation for those EEC countries that have approved it.
Canadian Parliament Standing Committee calls for more research before irradiation is widely used, and recommends that wheat irradiation no longer be permitted.

INTRODUCTION

Irradiation. The very word is a bit scary, conjuring up images of Hiroshima and Chernobyl, x-rays and cancer. Despite its widespread medical uses, irradiation is inherently hazardous and therefore a source of great concern.

For most consumers, irradiation of foods has been an issue of theoretical, not practical, significance. But that's about to change. The nuclear industry and segments of the food industry, with assistance from government agencies, recently gained permission to preserve a wide variety of foods with irradiation. So while right now a small part of your dinner might have been bombarded with gamma rays, in the next few years hundreds of foods may be treated.

Zealous proponents paint an attractive picture of the glories of irradiation: more abundant food supplies, reduced use of dangerous pesticides, fewer hungry people, lower prices. Equally zealous opponents with health and environmental concerns paint a far grimmer picture: dangerous new chemicals in food, greater cancer risk, rotten food magically made "fresh."

While the "experts" bandy about such terms as kiloGrays, cobalt 60, and radappertization, the average consumer is left more confused than enlightened. Tony Webb and Tim Lang, of the London (England) Food Commission, and Kathleen Tucker, of the Washington, DC-based Health and Energy Institute (both non-profit organizations), have written this book for concerned citizens who want to understand both sides of the argument better.

The irradiation industry contends that "hundreds of studies" prove irradiation to be a safe and beneficial process. The closer one gets to those studies, though, the less persuasive they look. The Food and Drug Administration, which has approved irradiation of many foods, has faulted a number of the studies because they were poorly designed or performed by untrustworthy laboratories. The agency

has cited five studies in support of its approval of irradiation, but it doesn't claim that this handful of studies can be considered decisive—and it hasn't satisfactorily addressed several studies that did show adverse effects.

The primary consumer safety issue revolves around the new chemical compounds—unique radiolytic products (URP)—produced in foods by irradiation, and whether some of these substances are harmful. Ideally, each new substance would be isolated, identified, and fed in large quantity to laboratory animals, or otherwise tested to determine if it can cause mutations, cancer, liver damage, immunological deficiencies, or other problems. But such tests would be extremely expensive and time-consuming, and they will probably never be conducted. In the absence of those tests, the FDA says that, judging from known radiolytic products, none of the chemicals produced by irradiation is likely to be harmful. Furthermore, even if they were harmful in large amounts, the minuscule levels produced in food would pose no risk to consumers.

Many consumers who don't feel their doubts have been satisfied would prefer to avoid treated food. But will they be able to? The FDA says, "sort of—at least for a while." The law requires that irradiated foods be labeled with identifying wording ("treated with irradiation") and a flower-like symbol only until 1988. At that time the wording requirement will expire, although the FDA may extend it. Furthermore, labeling is required only when the entire food has been treated. So, for example, vegetable soup containing irradiated potatoes would be exempt. Moreover, restaurants and cafeterias do not have to disclose the use of irradiation, just as they do not now disclose the use of dyes, preservatives, and other additives.

Another troubling point the authors raise is that it is impossible to determine whether a food has been irradiated, or at what dose. Consequently, government inspectors cannot verify that dosages have been kept to safe and legal levels. Conversely, when a manufacturer claims to have preserved its products with irradiation, there is no way to confirm this. The authors argue that, safety aside, irradiation should not be permitted until such detection and verification methods have been developed.

While most of the public discussion has focused on the danger of

radiolytic products to consumers, the authors identify other possible hazards:

- To what extent does irradiation affect vitamin content?
- Would unscrupulous processors use irradiation to reduce or destroy bacteria in substandard, decaying foods, and then sell these foods as though they were fresh, high quality products? (This illegal activity has already occurred in Europe.)
- Might workers in irradiation facilities inadvertently be exposed to dangerous levels of radioactive materials?
- Would radioactive materials be dispersed accidentally through the environment?

It is questions like these that have made many people nervous about the whole technology. And in response to that nervousness, executives of a number of supermarket chains and manufacturing firms have said they will not market irradiated foods until consumers' concerns have been more adequately satisfied.

The issue of irradiation is but one of many food safety problems that clamor for the public's attention. Top government and industry officials sanctimoniously claim that Americans enjoy "the world's safest food supply." But lower-level officials and scientists acknowledge numerous, serious problems. The Center for Disease Control, for instance, estimates that food poisoning, caused by *Salmonella, Campylobacter,* and other bacteria, kills about 9,000 Americans a year and causes tens of millions of illnesses. The FDA has acknowledged that farmers and veterinarians are illegally using vast numbers of drugs on livestock. And certain legal animal drugs—antibiotics—are undermining the value of antibiotics as medicines for people. Plant foods are not necessarily pure, because most are contaminated with residues of one or more pesticides, and some contain illegally high levels. Finally, of course, are the food additives that can cause everything from headaches to asthmatic attacks to cancer in susceptible individuals: MSG, sulfite, sodium nitrite, saccharin, and others. Even without irradiation, our dinner plate is chock-full of question marks.

To help make our food supply truly the world's safest, the Center for Science in the Public Interest, in coalition with other national and local organizations, is sponsoring the Americans for Safe Food project (P.O. Box 66300, Washington, DC 20035). Americans for Safe

Food is a broad-based effort that is harnessing the energies of consumers, environmentalists, organic farmers, and others to increase the availability of uncontaminated food: food grown and processed without pesticides, chemical additives, drugs . . . and irradiation. If the market demands such food, eventually the producers will supply it. And as long as foods are treated with pesticides, other chemicals, or irradiation, labels or shelf markers should clearly say so.

The irradiation controversy will certainly intensify in the coming years if the government approves more uses and if industry invests in new plants. It is not only food that is at issue, but also the development of a new nuclear industry that would make radioactive materials—with their inherent dangers—increasingly a part of our everyday lives. Fortunately, though, few foods are now being irradiated, and no large industry is unilaterally determining national policies. There is time for considered debate and, where appropriate, more scientific research. And with that time, citizens have an opportunity to develop their own position on whether to take or leave irradiated food—or, indeed, whether food irradiation and the technology that surrounds it should be stopped altogether.

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CHAPTER 1

THE BEST THING SINCE SLICED BREAD?

WE ALL NEED to eat. The recent support for famine aid projects shows that we are concerned for those who do not have enough food, or not enough of the right kind. Among those of us who have enough, there is also concern over the quality of the food we eat.

We want good fresh food with fewer additives and pesticide residues. At the same time, we want to be able to eat what we like, when and where we like. We have come to expect seafood in the Midwest, fresh fruit in the middle of winter. We often want food that can be quickly turned into an attractive meal. In short, we want quality and convenience.

The food industries have used a variety of methods over the years to both encourage and meet the demand for convenience. As well as processing food to simplify the task of preparation and cooking, considerable effort has gone into developing techniques to preserve or extend the shelf life of food. These techniques have included cooking, salting, drying, bottling, canning, packaging, smoking, chilling, freezing, dehydrating, and using chemical additives. The main aim has been to extend the time that food can remain in storage, in transport, or in the stores before it is sold to the customer, and the time he or she can keep it at home before it goes "bad."

We have, in fact, been remarkably successful in doing this. As a result, the developed world now enjoys, literally, the fruits of the earth, and access to just about every food available anywhere on the globe. We have, however, been less successful in sharing these benefits with the less well-developed countries. Apart from extreme cases of famine and drought, the problem of hunger is not one of shortage but of a failure to distribute the food to those in need. Much of this is undoubtedly due to economic factors. We can afford their food; they cannot. But, equally, we cannot be blind to the fact that some 25 to 30% of the food in many areas is wasted for lack of the ability

to harvest, store, and transport it to where it is needed. Any additional technology that adds to our ability to preserve food deserves consideration.

However, each of the preservation techniques has a price—both an economic one and a price in terms of the damage it does to the quality of the food. Processing and storage inevitably result in some loss of nutrients and the traces of vitamins that are needed to maintain health. Freezing may damage the texture of foods. Even cooking causes some effects that are undesirable from a health standpoint, even though it makes many foods edible. No system for preserving food is 100% perfect.

It is also being recognized that some techniques are less perfect than others. The growing concern over chemical additives has, in many instances, a solid foundation. Many additives are not used for preservation but for cosmetic or economic reasons, making the food look attractive but disguising a lack of nutritional value. A number of those officially approved as "safe" have been shown to be hazardous to human health. Others cause acute reactions in particular individuals that suggest a cause for concern, not just for the susceptible group but perhaps for the whole population. Workers who handle these chemicals in much larger quantities than those consumed by the public can and do suffer health damage from breathing and handling these additives. These workers are, in a very real sense, the guinea pigs on whom we can observe just how hazardous some of the additives are. Many of the studies in which such chemicals were safety-tested on animals have been found to be poorly conducted or, in some cases, downright fraudulent.

The demand for high-quality food has expanded far beyond the "health food" lobby where it began. It goes beyond those who can afford to buy into alternative lifestyles. It is being reflected in the policies of leading supermarket chains that now insist their suppliers provide additive-free alternatives to many common processed goods. Public school boards have set standards for their suppliers in order to provide a more healthy diet for school pupils. National governments are advocating gradual but significant dietary change as a way of combating some of the killer diseases of our age. All of this is changing the face of the food industry and the expectations we have of food and a balanced diet.