Strategies for Communicating the Facts on Food Irradiation to Consumers

CHRISTINE M. BRUHN

Center for Consumer Research, University of California, Davis; Davis, CA 95616

(MS # 94-217, Received August 22, 1994/Accepted August 22, 1994)

ABSTRACT

The majority of consumers will respond positively to irradiated foods when the advantages of the process are explained and when safety, nutritional value, and worker and environmental concerns are addressed. Communication strategies involve identifying the audience, selecting the communication medium, presenting the benefits of the process, and addressing myths. The most significant public-health benefit of irradiation is the reduction of food-borne pathogens. Irradiation should be described in lay terms and presented as an additional step which enhances microbiological safety. Nutritional safety and environmental myths must be addressed. Multimedia presentations utilizing the popular press are most effective. Since health authorities are the most credible spokespersons, opportunities for information exchange between health officials and community leaders should be developed. Consumer resources are listed.

Key words: Food irradiation, consumers, communication, attitudes

Attitude studies and market tests demonstrate that, when given the opportunity, consumers accept irradiated foods. The majority have not had that choice, and their knowledge of the technology is limited. Consumers want information about the benefits and safety of the food and the irradiation process. Information should not be limited to food safety and wholesomeness considerations, however. An increasing number of consumers are concerned about the economic, ethical, and environmental impact of technology in general. When the public has little understanding of these issues, they can be manipulated by special-interest groups bent on halting the application of irradiation.

It is not unusual for consumers to express concern about a new technology. Many express concern about technologies generally recognized as safe (16). Expressions of concern should not halt the adoption of a technology that offers advantages; rather they highlight the importance of educational programs.

People differ in their confidence in regulatory agencies, personal value orientation, and interest in processed food. Some will not select irradiated foods, but attitude and market studies indicate the vast majority prefer the advantages this technology offers (3, 5, 6, 7, 15, 19, 20, 23, 24).

Communication strategies involve identifying the target audience, selecting the communication medium, and focusing the message to present the benefits of the technology from the consumer's perspective, to respond to environmental and worker safety issues, and to put to rest the myths perpetuated by special-interest groups.

TARGET AUDIENCE

Irradiation can provide higher quality food to the consumer, permit the safe transport of produce from insect-quarantine areas, replace less-safe chemical fumigants, and extend product shelf life. The benefit that is most poignant, however, is enhanced microbiological safety. A significant number of consumers are concerned about the potential hazards of bacteria (8). Without doubt the tragic Escherichia coli outbreak in the West has increased consumer awareness and concern. Irradiation significantly reduces the hazard of food-borne illness by destroying these food-borne pathogenic organisms. This role of irradiation should be highlighted in public communications. The use of irradiation to replace chemical treatment is important from an environmental perspective. Other benefits of irradiation may be positioned less prominently at this time.

Anyone can enjoy higher food quality, longer shelf life, and wider product availability. Those most at risk will reap the greatest benefit from increased safety. This includes children under five years, older adults, and people whose immunity is compromised by illness or disease. Target audiences for the food-safety irradiation message would be parents of young children, adults over fifty, and anyone who needs the safest food.

COMMUNICATION MEDIUM

The controversy of 1989 over the use of Alar® on fruit demonstrated that messages are most effective when repeated in multiple sources. Consumers indicate they get the majority of science and food-safety information from television, newspapers, magazines, and the radio (2, 13). The goal of a communication campaign would be to present information in media specific to the target audience, such as the magazine Modern Maturity to reach seniors, Parent-Teacher Association (PTA) newsletters and parenting maga-
zines to reach parents of young children, as well as sources to reach a general audience.

Multiple coverage could be achieved by expanding a model developed by Dr. Loaharanu, of the International Atomic Energy Agency/World Health Organization. Leaders of consumer groups, representatives of groups at risk, and media persons could be invited to attend a nationwide workshop in which they have the opportunity to develop a dialogue with public health officials and scientists regarding the significance of food borne illness and the potential of food irradiation to enhance health by increasing food safety. The role of irradiation to replace less safe chemical fumigants, such as methyl bromide, could also be included. When presented on a small scale in Thailand and Mexico, this type of program attracted local media and generated numerous factual media pieces about food irradiation.

To maintain momentum in this educational effort the message must be picked up in the popular and professional press. Materials could be written for the public and for health professionals, press kits prepared for the media, and editorials written for newspapers. A letter could be sent to the syndicated newspaper columnists Ann Landers or Dear Abby describing the irradiation process and making a case for consumer choice in the market place. Review articles could be prepared for health professionals and submitted to the appropriate professional journals.

Communication strategies should not be limited to workshops and media pieces. The food label, point-of-purchase informational flyers, and other educational material facilitate information exchange. Consumer flyers could be made available through Cooperative Extension and The U.S. Department of Agriculture Food Safety and Inspection Service (FSIS) and offered to the meat and poultry industry and supermarkets.

MESSAGE

Irradiation should be explained in lay rather than technical terms. The phrase “exposing food to nuclear magnetic energy” is not easily understood by the public. A more consumer friendly definition is “Irradiation is treatment of food with energy from X-rays or gamma rays for a specific purpose.” Comparisons made to other food treatments could build on the familiar and increase understanding of the role of irradiation in reducing pathogens, e.g., “Irradiation is like pasteurization, except that pasteurization uses heat energy and irradiation uses another form of energy.”

Product attributes play an important role in acceptance of technological innovations (18). In market tests, irradiated mangoes, papayas, strawberries, and other produce items had an easily identified superior attribute, good flavor. Enhanced microbiological safety is also an attribute consumers view positively. Presented without a background explanation, however, irradiation could be viewed as a substitute for proper food sanitation. Consumers need information about microorganisms and food safety which includes these points: (1) Microorganisms are a natural part of the ecosystem. Salmonella and E. coli are found in healthy animals. (2) Microbiological safety must be achieved; it does not occur automatically, even in a visually clean environment. Since bacteria are ubiquitous, measures must be taken to control them. These include chemical dips or sprays, treatment with energy, i.e., food irradiation, or treatment with heat. (3) The methods of control should be compared for effectiveness, safety, effect on flavor, and effect on nutrition. Proper cooking destroys Salmonella and E. coli; however, the potential for crosscontamination is increased when raw contaminated food enters the kitchen. Chemical or energy treatment destroys the microbes before they are brought home.

Many people recognize personal responsibility in selecting safe food and maintaining that safety (17). A comparison of the risks and benefits inherent in different choices builds consumer knowledge and can impact current and future decision making. When presented with more complete information, many people prefer irradiation (22).

More complete background information is also needed on treatment of spices. Consumers believe the choice is natural, wholesome spices or irradiated spices. When told that most spices are fumigated to control insects and/or microorganisms, the majority prefer irradiated spices (22).

The perspective of a comparison is critical. Consumer confidence is lowered by “changing science,” i.e., something is considered safe today, but hazardous tomorrow (4). Fumigation should not be presented as hazardous; sanitation is improved compared to the untreated product. Irradiation, rather, is a positive move along the continuum of safety. Ten, twenty, or fifty years from now another process could replace irradiation, but today, it offers the greatest safety and quality.

Consumer concerns about pesticide residues remain high, even though many have heard that the benefits of pesticide use exceed potential risk (8). In attitude studies many consumers indicate they would prefer irradiated to fumigated fruits (22). As a replacement for methyl bromide, irradiation offers the opportunity to move along the continuum for environmental safety. Consumer interest in irradiated soft fruits, where irradiation is used to control molds, is less than in other applications; however, actual marketplace behavior demonstrated strong acceptance. (15, 19, 22).

Special-interest groups opposed to irradiation build on fear of the unknown and the public’s limited understanding of nuclear science. Recognizing that irradiation sounds similar to radiation, they compare treating food by radiation to exposing the human body to radiation. In fund-raising literature and media conferences they allude to dangers from nuclear bombs, raise fears of leaks from nuclear power facilities, and explicitly state that eating irradiated foods causes cancer. Misconceptions communicated to the press should be clarified.

Myth: Irradiation is not safe, and the scientific community opposes its use

Respected national and international organizations, such as the American Medical Association and the World Health Organization, endorse the safety of irradiated foods. Scientists acknowledge that no process can be proven safe; rather, scientists develop scenarios to test safety. Irradiated food has been fed to multiple generations of laboratory animals and to human volunteers with no ill effects (10, 11, 12).
Opponents claim that irradiation produces unique compounds and specifically cite benzene and formaldehyde as hazardous by-products of the irradiation process. Chemicals are formed during irradiation; however, they are similar to those formed when food is cooked. Benzene and formaldehyde may be formed in some products; however, the level is many times lower than found in commonly eaten foods. It is not the presence of a compound that is hazardous, but the quantity. Animal and human testing indicate no harmful effect, even when 100% of the diet is irradiated.

Some scientists contend that irradiation should be treated like food additives, that is, compounds extracted from irradiated food and then concentrated in the diet. Others respond that the amount of compounds formed are so minute this task would be technically difficult. Additionally it would not provide meaningful data for human evaluation. Current testing in which the complete diet is irradiated is a sufficient testing parameter.

Opponents say irradiated food causes cancer in children. An Indian study in which five malnourished children were fed freshly irradiated wheat is the basis for this claim. When it is cited by opponents, this study must be fully explained, and the fallaciousness of the interpretation developed by opponents revealed (21).

Myth: The public will not know what foods are irradiated
Labeling of irradiated foods is required, except in restaurant foods and when irradiated spices and dried vegetables are used as flavorings in mixed dishes. Opponents cite increased purchasing of food away from home and want labeling on restaurant foods. If accompanied by an educational program, consumers may prefer the safety of irradiated foods compared to the potential food-borne illness from nonirradiated food.

Myth: The food irradiation industry safety record is poor
Today's consumers are increasingly concerned about environmental and worker safety (8, 17). Since there are about 40 irradiators in the United States, a safety record is readily available. A facility using cesium 137 experienced a leak of radioactive material in 1988. This was cleaned up with no damage to the surrounding community (26). Because cesium is soluble in water, it is difficult to contain. Therefore, one type of cesium 137 capsule has been withdrawn from use in pool sources. The most commonly used source material is cobalt 60 encapsulated in stainless steel. All facilities are carefully monitored for leaks.

Myth: Transportation of radioactive cobalt is hazardous and people will be harmed by accidents. Community safety is not protected
Transportation of radioactive material has occurred for more than 40 years. Containers and irradiation facilities must meet specific standards of safety (26).

Myth: Irradiation facilities will add significant amounts of radioactive waste to the environment
Cobalt used in food irradiation facilities could be "recycled" from that used to sterilize medical equipment. Nordion, the North American company that produces cobalt 60, estimates that all the cobalt 60 they produced could be stored in a space the size of an office desk. When the technology evolves sufficiently, machine generated energy sources may replace radioactive material.

Myth: Activist groups reflect public views and protect the public interest
Activist groups have their own agendas, and they differ in their reliance on science-based information. All groups, however, rely on membership for fund-raising. There is therefore a strong incentive to identify "risks" and solicit funds in order to "protect the public interest" while maintaining the financial solvency of the organization.

Myth: Irradiation destroys the nutritional content of food
There is some loss of vitamins, but it is comparable to that of other processing technologies. Opponents claim high losses because they refer to studies that expose food to high doses not permitted in the United States or they refer to older studies that failed to accurately measure nutritional value (9, 25).

Myth: Consumers do not want and will not accept irradiated foods
Marketing studies clearly demonstrate that consumers will select irradiated over nonirradiated food if they perceive benefits (15, 19, 20).

Credibility of spokespersons
Consumers indicate that they evaluate the credibility of a message by the credibility of the person conveying the message, by their personal judgment if the message makes sense, and by the frequency with which they hear the message (7, 14). People who have purchased irradiated food generally trust the industry and the scientific community to make correct judgments. Government agencies such as the FDA/USDA however, are not powerful endorsement bodies (22). Consumers have less confidence in the credibility of government information compared to that from health professionals (8, 13). Endorsements by the American Medical Association and the World Health Organization should be widely used because of their higher credibility (1).

CONSUMER RESOURCES
The following science-based educational materials are recommended for the lay audience:

Facts about Food Irradiation, a booklet produced by the World Health Organization which addresses all areas of consumer concern.


"Food Irradiation, The Story Behind the Scare," an article in American Health, December, 1992 - clearly summarizes information on irradiation and includes a critique of Food and Water, Inc., an irradiation opponent.

"Food Irradiation: Toxic to Bacteria, Safe for Humans" and "The Growing Use of Irradiation to Preserve Food," articles in the FDA Consumer, November 1990 and July
1986, respectively; good overviews of irradiation, although they do not reflect current FDA approvals.

"Free and Informed Consumer Choice: The Case for Food Irradiation," a book by Morton Satin, (21) a lucid piece emphasizing the dangers of food borne illness, with a particularly clear section on the Indian study.


"The Future of Food Preservation: Irradiation," a video developed by Olivia Wood at Purdue University.

FUTURE BENEFITS

Many consumers are ready to buy irradiated food today. However, the majority want information about the benefits of the process, food safety, and worker/environmental safety. An investment in consumer education is required to open the market for irradiated food, but the rewards in food safety, food quality, and environmental safety are substantial.

REFERENCES
