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Consumer Acceptance of Irradiated Food

A Global Survey

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Background

There was a widely held opinion during the 1970's and 1980's that consumers would be reluctant to purchase irradiated food, as it was perceived that consumers would confuse irradiated food with food contaminated by radionuclides. Indeed, a number of consumer attitude surveys conducted in several western countries during these two decades demonstrated that the concerns of consumers on irradiated food varied from very concerned to seriously concerned.

This paper attempts to review parameters conducted in measuring consumer acceptance of irradiated food during the past three decades and to project the trends on this subject. It is believed that important lessons learned from past studies will guide further efforts to market irradiated food with wide consumer acceptance in the future.

Consumer attitude surveys

Public debate on food irradiation started in the early 1980's when a number of governments, notably Australia, Canada, UK and USA started introducing national regulations on food irradiation following the recommendation of the Codex Alimentarius Commission to accept Codex General Standard for Irradiated Foods in 1984. In doing so, their proposed regulation were subjected to public comments. A number of consumer groups, some self-appointed and aligned themselves with anti-nuclear movement, emerged to oppose the use of this technology. Their tactics ranged from spreading inaccurate and unscientific propaganda against the technology or lobbying members of congresses/parliaments, issuing threats to food companies that expressed an interest in using food irradiation, picketing food



stores which conducted (or wish to do so) market trials of irradiation food. Their sensational actions were often picked up by the media which generated controversy on this technology.

The controversy and public debate on food irradiation during the 1980's which, in some small way, is spilling over into this decade has motivated a number of consumer groups, academic institutions, food industries and companies specializing in consumer responses, conducted a number of consumer attitude surveys to determine whether consumers would be willing or prepared to accept irradiated food. Most of these surveys were conducted through telephone interviews, home interviews or mailed questionnaires, especially in advanced countries such as Canada, UK and USA at the time when irradiated foods were not available for retail sale. Early surveys indicated that consumers were not familiar with irradiated food (Anon., 1984, 1986; Titelbaum *et. al.*, 1983; Weise Research Associates, 1984; Bruhn *et. al.*, 1986). The outcome of these surveys led to further public debate whether consumers will accept irradiated food or not. An interesting outcome of these surveys showed that the public and health professionals gained a better understanding of the technology and often made positive statements about it. From these surveys, Bord and O'Connor (1989) concluded that the extent to which the public will accept or reject irradiated food depends on the presence or absence of information about the topic. Interviews with those who knew something about irradiation and responded correctly to information about the technology were significant more willing to accept irradiated food.

Starting from the late 1980's, universities, professional societies and industry groups have included irradiation in their public information programmes, and information began to reach the public especially those in western countries. Initially, coverage by the media, the primary source of information, has frequently focused on special interest groups who oppose irradiation (Bruhn, 1993). More recently, however, major newspapers especially in the USA have gained a better understanding of various issues related to irradiation and reported to the public. The public in the USA was accurately informed about this technology when several television networks, notably ABC's 20/20 programme, began to air accurate information regarding this topic.

The outbreaks of *E. coli* 0157:H7 in the west coast of the USA in early 1993 when several children died and hundreds of individuals were hospitalized because of the consumption of undercooked hamburgers contaminated by this pathogen, resulted in the first public interest in using irradiation to ensure hygienic quality of food of animal origin.

The American Meat Institute funded a nation-wide three-part study conducted by Gallup Organization, University of Georgia's Centre for Food Safety and Quality Enhancement, and Abt Associates, to measure consumer attitudes to irradiation in relation to food safety (AMI Foundation, 1993). The Gallup survey found that while most consumers were aware of food irradiation, few were knowledgeable of the process. Seventy three percent of consumers had heard of irradiation. However, only five percent knew a lot about the process, while 19% knew something about it. According to the survey, after the benefits of irradiation are explained and endorsements by health organizations such as American Medical Association, Food and Drug Administration, World Health Organization are mentioned, 54% of those interviewed said they were willing to purchase irradiated meat rather than non-irradiated meat. Sixty percent of the survey participants said they would be willing to pay a 5% premium for hamburgers with bacterial counts greatly reduced by irradiation. Consumers viewed irradiation as more necessary for meat, seafood and poultry products than for fruits and vegetables.



In the simulated supermarket selling study conducted by the Centre for Food Safety and Quality Enhancement, University of Georgia, 50% of consumers tested chose irradiated ground beef over non-irradiated ground beef. After the consumers tested learned more about the irradiation process and how it affects raw meats, those choosing irradiated beef increased to 70% of the sample size.

The conclusions from various consumer attitude surveys, conducted mainly in advanced countries, showed that consumers at large are still not knowledgeable about food irradiation. They need accurate information about the safety, benefits and limitations of food irradiation to be able to make an informed decision whether they will accept irradiated food or not. Similar conclusions could be made about consumers in developing countries.

Market testings and retail sales

The opinion of consumers about irradiated food is quite different when they are given the opportunity to select and purchase the food. During the past two decades, a number of market trials of several irradiated food items with clear labelling indicating the treatment, were carried out in both advanced and developing countries. A variety of irradiated food including onions, potatoes, garlic, mangoes, papaya and other tropical fruits, strawberries, dried fish, fermented pork sausages, cheeses, etc. were put on sale, often alongside non-irradiated ones. Positive results, which showed that consumers either preferred irradiated food or were willing to accept irradiated food at the same level as non-irradiated ones, were registered in all countries, i.e. irradiated mangoes and papaya in the USA in 1986 and 1987 (Giddings, 1986; Bruhn and Noel, 1987), irradiated strawberries and camembert cheese in France (Timsit, 1987; Bougle and Stahl, 1993); irradiated potatoes in Poland (Fiszer, 1988), irradiated apples, garlic, ginger, hot pepper and meat products in China (Zhu, 1994), irradiated fermented pork sausages locally known as Nham in Thailand, which is almost always consumed raw (Prachasitthisak, 1989), irradiated onions in the Philippines (Lustre *et. al.*, 1985), irradiated dried fish in Bangladesh (Matin *et. al.*, 1988), irradiated onions and garlic in Argentina (Curzio *et. al.*, 1986), etc. In none of these trials, actually carried out in market places where consumers could make own choice whether to buy irradiated food or not, was there any evidence to indicate that informed consumers will not accept irradiated food.

Following the operation of the first commercial food irradiator in the USA at Mulberry, Florida, in 1992, consumers in the USA have had more opportunity to purchase several types of irradiated food. Most of the success in market trials and commercial sale of irradiated food could be attributed to a pioneering effort of Carrot Top, Inc. a small grocery store in Northbrook, Illinois, which decided to start marketing irradiated strawberries, citrus, mushrooms, onions in 1992. Again, when the USDA approved the irradiation of poultry in 1993, this grocery store started to offer irradiated chicken to its customers with success. It was clearly demonstrated by Carrot Top that the demand for irradiated food could be overwhelming once consumers are aware of the safety and benefits of irradiated food. For example, the sale of irradiated strawberries over non-irradiated ones was 11 to 1 in 1992 and 20 to 1 in 1993 (Corrigan, 1993). Starting from 1995, several batches of papaya, lychees, cherimoya, rambutan from Hawaii were irradiated in Chicago area and marketed widely in the midwest of the USA. The total quantity of such irradiated fruits marketed to date was about 50 metric tonnes. The fruits were well received by consumers and there appears to be an unlimited demand for such fruits.



Through such market trials, consumers learned how to weigh risk versus benefits of irradiated food in comparison with either untreated food or food treated by pesticides. For example, consumers in Thailand were so convinced that irradiation has removed the risk from microbial and parasitic infection, often associated with consumption of raw fermented pork sausages (Nham), that several manufacturers of the product are marketing it routinely in most supermarkets in Bangkok. Similarly, consumers in Bangladesh were pleased with irradiated dried fish instead of products which were previously fumigated with various pesticides including DDT. Irradiated dried fish has been marketed with success since the semi-commercial scale food irradiator came into operation in Chittagong in early 1994. In France where there is strict microbiological standards, irradiated frog legs have been marketed routinely in supermarkets in the past ten years.

What have we learned from past experience?

Both consumer attitude surveys and market trials of irradiated food provided us with the following important information:

- consumers are conservative about new technologies
- consumers' attitudes and willingness to purchase are influenced by information
- consumers are largely unaware of the safety and benefits of irradiated food
- labelling of irradiated food, if properly done, can have positive effect on consumer

The most important factor which has influenced consumers' attitude or decision to purchase irradiated appears to be information given to them. If the consumers received mainly negative information about irradiated food, it is likely that they will not be willing to purchase the food. However, if the information is well-balanced by pointing out the problem (s) which may or may not be familiar to consumers as well as the solution which irradiation, in comparison with other technology, can bring, consumers would likely be more willing to purchase irradiated food.

The pros and cons about irradiated food have provided much needed information to governments, the food industry and the media. These three key players have realized that irradiation is strongly supported by science. They have therefore become more objective in considering the acceptance and application of this process. This was demonstrated very recently following the outbreaks of *E. coli* 0157:H7 and the largest ever recall involving some 10,000 metric tonnes of frozen ground meat in the USA. The food industry and the media have been unanimous in demanding the use of irradiation to ensure hygienic quality of meat. It appears that the government would also be willing to approve such use, especially after the Congress passed an FDA reform bill which includes an approval of irradiation for red meat within 60 days.

It is therefore clear that consumer acceptance of irradiated food is not a major issue as was once perceived. The more important and overriding issue is to put irradiated food in the market so consumers could exercise their freedom of choice and learn the real benefits of irradiation.



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