

**FIRST WORLD CONGRESS ON FOOD IRRADIATION:  
Meeting the Challenges of Food Safety and Trade  
McCormick Place  
Chicago, Illinois  
May 5-7, 2003**

**SUMMARY REPORT  
July 3, 2003**

As food safety, security and trade continue to be top priorities for global food and agricultural commodities, the acceptance of irradiation as an effective sanitary and phytosanitary treatment is increasing.

A diverse group of almost 200 conferees from 22 countries met at McCormick Place in Chicago May 5-7, 2003, to discuss the food safety and public health aspects of food irradiation - making the Congress the first-ever event to be well attended by members of the food industry and trade.

**Terms to know**

*Sanitary:* human and animal health

*Phytosanitary:* plant health

Co-organized by the National Food Safety & Toxicology Center (NFSTC) at Michigan State University, the First World Congress on Food Irradiation drew representatives from food irradiation equipment and service providers; supermarket chains; restaurants; food service distributors; meat, poultry and fresh produce companies; university

researchers, public health officials, trade associations, consumer groups and food industry media.

Organizational and industry co-sponsors of the First World Congress on Food Irradiation included: Food Marketing Institute, National Food Processors Association, Grocery Manufacturers of America, Institute of Food Technologists, International Union of Food Science and Technology, Association of International Industrial Irradiation, W.W. Johnson Meat Company, Minnesota Beef Council, SureBeam Corporation, MDS Nordion, Steris Inc., and GUARDiON/IBA.

The National Food Safety & Toxicology Center at Michigan State University welcomed the wide range of perspectives shared on food irradiation at the Congress, said Dr. Ewen C.D. Todd, director of the National Food Safety & Toxicology Center. "We agreed to organize and co-sponsor the event to provide a platform for a wide variety of decision-makers to discuss this important and timely issue," he says.

Within four technical sessions presented by a total of 28 speakers, the Congress examined:

**Types of Irradiation Technologies**

Food irradiation is physical means of food treatment comparable to heat pasteurization, canning or freezing. The process involves exposing food, either packaged or in bulk, to one of three types of ionizing energy: gamma rays, machine generated electrons or X-rays. This is done in a special processing room or chamber for a specified duration.

**X-ray:** The origins of irradiation technology can be traced back to 1895, when a paper published by Wilhelm Conrad Roentgen described the production of X-rays. Within a year, an article appeared that reported on the ability of X-rays to kill bacteria. In today's systems, a piece of metal is stationed between the electron beam and the product to be irradiated. The piece of metal reacts with the beam and creates X-rays. The X-ray system is able to penetrate greater depths than E-beam technology.

**E-beam:** The electron beam processing system irradiates food using only commercial electricity to help eliminate the threat of dangerous food-borne bacteria. The SureBeam process does not use any radioactive materials whatsoever, as older technologies do. Both E-beam and X-ray systems are powered by electricity.

**Gamma:** The most common source of gamma rays for food processing is the radioisotope cobalt 60. Food is treated by cobalt 60 gamma rays in a facility known as an irradiator. Gamma energy is electromagnetic radiation of very short wavelength, similar to ultraviolet (UV), visible and infra-red light, microwaves and radio waves used for communication. We use these forms of energy for a wide

- The global situation and outlook on the use of irradiation as a sanitary and phytosanitary treatment
- Major markets and market trends
- Technological developments: irradiation facilities, new products, value addition, quality assurance
- Investment opportunities

range of purposes; for example, to cook food in microwave ovens.

The following are excerpts of presentations and discussion of the Congress:

### **I. Opening Statements by Congress Co-sponsors and Keynote Address by Dr. Elsa Murano, U.S. Department of Agriculture Under-Secretary for Food Safety**

#### ***MSU's history of irradiation research lives on through the organization of Congress***

In August 2002, Dr. Ewen C.D. Todd, director of the NFSTC, and Paisan Loaharanu discussed an idea which became the First World Congress. Todd and Loaharanu saw it as a tribute: MSU was a pioneer in irradiation research by the late Dr. Walter Urbain during the 1960s. NFSTC was pleased to co-sponsor and co-organize the Congress because food irradiation is one of the most effective ways of eliminating pathogens from raw and frozen meat and poultry products, which continue to be implicated in foodborne disease outbreaks, Dr. Todd says. The objectives of the Congress on using irradiation to enhance food safety and trade fit well within the Center's goals on research, education and outreach. Dr. Todd anticipated that the Congress would be a turning point for public acceptance and industry willingness to move forward with irradiation in a variety of foods and that the outcome would pave the way for future developments on food irradiation on a global basis. The NFSTC is a multidisciplinary center established to solve food safety-related problems based on sound science and expertise at Michigan State University, Dr. Todd says.

#### ***FMI Show 2003 creates anchor for Congress; buoyed by many supporters***

With more than 30,000 attendees to FMI Show 2003 downstairs from the Congress at McCormick Place, the timing couldn't have been better for both events. FMI Show attracts the U.S. and the world's top retail executives - 30,000 U.S. food industry professionals - which includes 6,000 international attendees from 133 countries. FMI has been supportive of food irradiation for many years and was pleased to see that the Congress was held during FMI Show - which in turn attracted more attendees to the Congress, said Dr. Tim Hammonds, president and CEO of Food Marketing Institute (FMI). Dr. Hammonds noted that irradiation has proven to be an effective food safety tool and that its use is increasing in the USA and some other countries. He assured the participants that FMI was committed to enhancing the role of food irradiation to protect consumers' health as well as facilitating food trade.

Dr. Hammonds was joined by Dr. Mark Nelson, vice president of the Grocery Manufacturers of America (GMA) and Dr. Mark McLellan, president of the Institute of Food Technologists (IFT), who stated that their organizations were pleased to be co-sponsors of the Congress, and to note that irradiation has emerged as an effective food safety technology with increasing acceptance by the public.

Dr. David Lineback, president-elect of the International Union of Food Science and Technology (IUFoST), summed up the goals for the discussion: that the topics to be covered by the Congress were not only timely but important and exciting. Food safety and food trade have become global issues and the role of irradiation to meet these requirements has become increasingly important, he said. For example, there are many foods and food products that do not undergo a heating stage to inactivate pathogens, such as with some fresh meats and meat products. Irradiation offers an excellent opportunity to significantly improve food safety in these instances, thus reducing the incidence of foodborne disease.

While questions continue to be raised about food irradiation and the safety of irradiated foods, food irradiation is probably the most thoroughly studied food technology that has been introduced into commercial practice, Lineback emphasized. Science can never answer all questions about any technology and absolute safety of any food can never be guaranteed – all the more reasons for the Congress discussion.

### ***International consultant sees (irradiated) fruits of his labor***

With more than 30 years of expertise on the research and use of food irradiation, Paisan Loaharanu knew there was a need for an international congress on the subject. Now a Vienna-based international expert on food irradiation, Loaharanu headed the food irradiation activities of FAO and IAEA through their Joint FAO/IAEA Division, Vienna, Austria, for more than 20 years including managing the Secretariat of the International Consultative Group on Food Irradiation (ICGFI) from its establishment under the aegis of FAO, IAEA and WHO in 1984. With much support and teamwork, Loaharanu's vision became reality. In thanking all the co-sponsors for the effective organization and sponsorship, Loaharanu, the co-organizer of the Congress, summarized "The Congress is expected to lead to a wider acceptance and application of food irradiation as a measure to ensure microbiological safety of food and to facilitate food trade worldwide."

### ***Keynote: Irradiation is a safe and effective tool***

Dr. Elsa Murano, Under-Secretary for Food Safety for the U.S. Department of Agriculture, knows irradiation from many perspectives. As a former researcher at several universities, she says she can apply her science base to public policy: including on food irradiation.

Murano's keynote address on "Food Safety from Farm to Fork: the Role of Food Irradiation" focused on the public policy implications of reducing disease using irradiation. Murano indicated that "Irradiation is the single most effective tool in killing foodborne pathogens. Irradiation is so effective as a single step that to accomplish the same thing you would have to have several technologies that we now have to reduce pathogens." She also stated that the USDA is moving to accelerate approval of interventional technologies and to educate the public about the safety of irradiated food products.

## **II. Global Development on Food Irradiation**

### ***World Health Organization concludes food remains wholesome and nutritionally adequate at average dose of 10 kGy***

Given its unique ability to destroy pathogens in solid foods, food irradiation may be one of the most significant contributions to public health to be made by food science and technology since pasteurization was introduced to assure the safety of milk.

– Dr. Moy, WHO

The World Health Organization (WHO) encourages its Member States to consider all measures to eliminate or reduce foodborne pathogens in food and improve their supplies of safe and nutritious food, according to Dr. Gerry Moy, staff scientist for the Food Safety Program at the WHO. Based on this decree, the WHO with the Food and Agricultural Organization of the United Nations (FAO) and International Atomic Energy Agency (IAEA), has spent four decades assessing food irradiation as a prerequisite to its widespread application in improving and extending the world's food supply.

In 1997, the last Joint Committee convened by the three UN agencies at WHO concluded that there is no need to impose a maximum dose limit for irradiated foods. With a dose either below or above 10 kGy as part of Good Manufacturing Practices (GMPs), food remains wholesome and nutritionally adequate.

This conclusion was incorporated into the revised Codex General Standard for Irradiated Foods, recognizing the safety of irradiated foods up to an overall average dose of 10 kGy. Through the Codex procedures, the 35<sup>th</sup> Session of the Codex Committee on Food Additives and Contaminants, held in Arucha, Tanzania, in March 2003, recommended to the Codex Alimentarius Commission to adopt the revised Codex Standard to recognize the safety of food irradiated with any dose as part of the GMPs. Additionally, foods may be irradiated with doses above 1 kGy if necessary and with technological legitimate purposes.

### ***A plan to recognize food irradiation as a food process, not a food additive***

In 1958, the U.S. Congress classified radiation as a source for food processing as a food additive. This label has been adopted in many countries, making food irradiation the only food process to be regulated as a food additive. This classification is in place despite the Joint FAO/IAEA/WHO Expert Committee on the Wholesomeness of Irradiated Foods' recognition of irradiation as a food process similar to heating or freezing preservation of food since 1976, and the Codex authoring of a General Standard for Irradiated Foods in 1983 calling irradiation a process.

At the Congress, Paisan Loaharanu, former Head of the Food and Environmental Protection Section, Joint FAO/IAEA Division, spoke to this regulation, proposing "Global Action Plans" based on sound science and the Codex General Standard for Irradiated Foods (recognized by the World Trade Organization as a reference to settle trade disputes).

The plan states that the labeling of irradiated food must be equitable with food treated by other processes. Additionally, Codex should assign an appropriate committee to consider future work on food irradiation among novel food processing methods and systems, Loaharanu said.

### ***Standards set by IPPC to facilitate fresh produce trade using irradiation as a phytosanitary measure***

Sound science, participation by technical experts and national authorities, and transparency are being used by the International Plant Protection Convention (IPPC), according to Robert Griffin, former IPPC Coordinator, in a paper entitled, "Development of IPPC Standard on Irradiation as a Phytosanitary Measure."

Similar to Codex Standards, IPPC Standards are recognized by the WTO through its Sanitary and Phytosanitary Measures (SPS) Agreement binding all member governments. At the request of the International Consultative Group on Food Irradiation (ICGFI) and the recognition of the IPPC Secretariat of the increasing important role of irradiation as a phytosanitary treatment, in November 2001 the IPPC began developing an "International Guidelines on Irradiation Phytosanitary Measures."

In April 2003, the Standard was adopted by the latest Session of the Interim Commission on Phytosanitary Measures (ICPM).

The Standard, while not forcing governments to use irradiation, will play an important role in facilitating international trade in fresh produce. Governments cannot deny entry of such produce purely because of irradiation to meet phytosanitary requirements. The food products would, however, have to comply with other national regulations prior to being sold in a particular country.

### ***Promoting the use of irradiation for ready-to-eat foods***

Prompted by large-scale recalls and illnesses associated with prepared and processed meats, it has

become even more apparent that the use of food irradiation as a pathogen reduction for ready-to-eat foods is long overdue.

In October 1999, Dr. Jeffrey Barach, vice president of special products at the National Food Processors Association (NFPA), led the Food Irradiation Coalition, a group more than 30 trade association members, in filing a petition with the U.S. Food and Drug Administration (FDA) to propose the use of irradiation for ready-to-eat foods.

At the First World Congress, Barach pointed out that the petition covers a variety of foods, and in fact, it is suggested that if all ready-to-eat foods were irradiated, that could represent up to 37 percent of the food supply.

The coalition's petition was filed shortly after the joint FAO/ IAEA/ WHO Study Group announced findings indicating that foods irradiated to any dose appropriate to achieve the intended technological objective are both safe to consume and nutritionally adequate.

The filing of a petition that covers several classes of foods vs. a more traditional "product by product" strategy was discussed. With no final rule for ready-to-eat foods in place to date, a review of strategies was made in order to consider how best to expedite the approval process. In this context, Barach stated that NFPA and coalition members believe that the irradiation of ready-to-eat foods must proceed as soon as possible, particularly for meat and poultry prepared and processed products.

### **III. Recent Developments for Food Irradiation in the United States**

#### ***Minnesota Model for educating consumers and marketing irradiated ground beef***

Education and a lot of free samples are the keys to consumer acceptance of irradiated foods, according to the Minnesota Beef Council. Since 1997, the council has moved ahead with national distribution of irradiated ground beef with the development of a Minnesota Model for commercializing the food product.

Led by Ron Eustice, executive director of the Minnesota Beef Council, featuring irradiated ground beef at a series of trade shows at state fairs, major meetings and restaurant shows, a series of press releases and media information widely distributed throughout Minnesota have created a model now accepted by other states. The model also encompasses educational workshops, issues management and partnerships with public agencies, ground beef manufacturers, retailers and restaurateurs.

One example of the public/private partnerships described in the model is the collaboration formed with Dr. Michael Osterholm, former chief epidemiologist for the State of Minnesota. Osterholm and the beef council mapped out strategies for educating consumers as to the safety and benefits of irradiation as a public health measure.

State beef councils, cattle organizations and others are using the Minnesota Model to inform consumers, beef producers and marketers about the advantages and benefits of irradiated ground beef. Minnesota-based companies are starting to hear those advantages loud and clear, Eustice says.

Huisken Meat Inc. began selling irradiated beef under its own brand name in 84 supermarket stores in May 2000. They have since expanded distribution to more than 7,000 supermarket stores in most states as of May 2003.

Sales of irradiated ground beef by Schwan's, a leading national home food delivery company, have been so successful that now the company only markets irradiated ground beef.

And, Dairy Queen, also based in Minnesota, became the first fast food chain to introduce irradiated hamburgers in its stores in Minnesota and is planning to expand its market to other stores nationwide.

### ***SureBeam Corp. leading the irradiation charge***

Rapid dose delivery (seconds vs. hours), an avoidance of the use of toxic substances, a lack of chemical residues and radioactive isotopes, and environmentally and operationally safe procedures are attributes touted by SureBeam Corp., one of the most widely known food irradiation equipment developers.

SureBeam's ability to eliminate pathogenic microorganisms and insect disinfestations in foods have appealed to more than 30 major supermarket chains and restaurant chains, according to SureBeam's senior vice president of international business development, Martha Cashman. Food distributors have also agreed to market irradiated products processed by SureBeam.

Having already established service centers in the United States in Chicago, College Station, Texas, Penn., New Jersey, Los Angeles, and Sioux City, Iowa, SureBeam is expanding its business into other countries including Brazil, Saudi Arabia and Vietnam.

SureBeam is supporting promotional programs with in-store demonstrations, direct mail, merchandising support and in-store signage. It also supports market research, particularly work being carried out at Texas A&M University. Among the results of the research, studies show that consumers who understand the benefits of irradiated foods would be prepared to pay higher cost, in some cases, as much as 25 cents more per pound, for irradiated ground beef.

### ***Huisken Meat Co. the first to market irradiated ground beef for supermarket shoppers***

In marketing new food technology for consumers, many companies are in a hurry to be second. When it comes to irradiated food, however, one company took the initiative to be first and has never looked back.

Huisken Meat Co., based in Minnesota, decided to sell irradiated ground beef in 84 supermarket stores in May 2000. As Cliff Albertson, COO of Huisken, explains, one motivating factor was the threat of ground beef recalls due to E. coli O157:H7.

Following the approval by the U.S. Food and Drug Administration (FDA) and U.S. Department of Agriculture (USDA) of irradiated ground beef as an E. coli countermeasure, Huisken has distributed food irradiation information to the media and consumers and has marketed ground beef under its "Be Sure" and "Irradiated for Safety" labels.

The popularity of this campaign has encouraged Huisken to market irradiated ground beef on a national scale.

### ***Reputation for feeding consumers safely leads to Wegmans' success in marketing irradiated ground beef***

Borrowing from cues learned in informing consumers about food safety and the proper cooking of beef, Wegmans supermarkets entered the irradiated ground beef market in April 2002. In recounting

Wegmans' experience in marketing irradiated ground beef sold under the supermarket's brand name, Senior Vice President of Consumer Affairs Mary Ellen Burris reported that sales exceeded projections by 15 percent.

Attributing to the success of the campaign, according to Burris, is a commitment to bringing consumers safe food. Wegmans was the first supermarket chain to provide packaging labels informing consumers of the risks associated with ground beef. Beginning in 1998, the grocer initiated a campaign urging consumers to cook ground beef to an internal temperature of 160 degrees F. The sale of ground beef increased during the same time frame.

Four years later, irradiated ground beef became available in 65 stores in the northeastern U.S. with the same commitment to keeping consumers safe. Soon thereafter, 50 other supermarket chains responded by offering irradiated ground beef.

During the campaign rollout, Burris reports that there were some anticipated and unanticipated consumer and activist responses. Yet, while activists threatened to introduce negative publicity in the media, there were only two letters sent to the editors. An unanticipated reaction came from the USDA, insisting that irradiated fresh ground beef should still be cooked to an internal temperature of 160 F.

Through a combination of teamwork, employee education and consumer information, Wegmans was able to expand the sale of irradiated ground beef nationwide.

### ***Dairy Queen serving up irradiated burgers and education***

As consumer awareness of food irradiation grows, consumers are willing to pay more for irradiated hamburgers, according to Doug Pavelka, vice president of International Dairy Queen. Based in Minnesota, Dairy Queen has been selling irradiated hamburgers for more than two years, and has discovered that 50 percent of their customers would pay 5 to 10 cents more for an irradiated burger.

Since Dairy Queen entered the food irradiation market by serving irradiated hamburgers in two restaurants in February 2002, the number of stores offering the product increased to more than 100 by April 2003. Pavelka bases the success of this offering on Dairy Queen's ability to educate consumers and ensure that the Dairy Queen staff is able to explain the technology and the added food safety benefits that irradiation can provide.

Within stores selling irradiated hamburgers, posters and table signs have been on display describing food irradiation. Through surveys, Dairy Queen has found that 62 percent of consumers are aware of the benefits of irradiation and that that number is increasing monthly.

By continuing to market irradiated hamburgers, Dairy Queen is hoping to expand to regional distribution areas and other outside markets, while continually charting customers and storeowners' feedback.

### ***Gamma technology from Food Technology Service winning over food distributors***

As food distributors chart their entry into the food irradiation marketplace, Dr. Richard Hunter, president of Food Technology Service, Inc. (FTSI), in Mulberry, Fla., is providing them with a smooth transition. Just ask Colorado Boxed Beef Corp.

With a full line of branded products for food service establishments, retail grocers and institutions, Colorado Boxed Beef has relied on FTSI's gamma technology in making its meat and fruit products

safer for consumption. Products marketed by Colorado Boxed Beef include fresh and frozen chicken, fresh and frozen ground beef, pork, turkey and various fruits and vegetables. The company currently has branded products in four retail grocery chains and more than 1,000 stores.

In courting food providers such as Colorado Boxed Beef, some attributes that FTSI presents include thorough product penetration, the irradiation of palletized products without package redesign, the independence from electrically-supplied energy, and the ability to irradiate a large variety of food at a low cost.

Along with Colorado Boxed Beef, several food service distributors sell FTSI-irradiated products for institutional and food service use and at least one regional restaurant chain uses irradiated chicken exclusively. Two large fruit and vegetable distributors are also using FTSI for disinfestations and the shelf life extension of their products.

Looking to the future of irradiation, FTSI has conducted tests on ready-to-eat and multiple-ingredient products for manufacturers anticipating approval of the pending U.S. Food and Drug Administration (FDA) petition related to these products. In many cases, these products are in bulk configurations that require the use of gamma or X-ray technologies for irradiation.

### ***Pushing taste, not technology, wins over customers in Hawaii and mainland U.S.***

Winning over customers to irradiated food may be as simple as letting them have their cake and eat it, too. In the case of a company named Hawaii Pride, the cake is papaya, and, says Vice President Eric Weinert, it took a lot of free samples to plant the seeds for a fruit irradiation facility that would blossom into a marketing and sales phenomenon.

Facing political and public opposition to the construction of a gamma irradiation center on the Big Island of Hawaii, Hawaii Pride partnered with SureBeam Corp. to market fruit, not technology, in trying to convince consumers to approve the facility. So powerful was the opposition to the construction of a gamma ray facility, that eventually, Hawaii Pride switched its original plans in order to construct an X-ray machine for fruit irradiation.

In a vote on banning irradiation technology, Hawaii Pride got the go-ahead for construction by a margin of less than one percent with 50,513 citizens casting ballots.

Next, by pushing fruit quality with posters, recipes, taste testing, and the strategic use of media coverage, Hawaii Pride was able to form relationships with retailers on the mainland. Since then, the sale of Hawaii Pride's irradiated fruit has dramatically increased. In supermarket chains such as Albertson's, Kroger and Safeway, operating in Minneapolis, Phoenix and Atlanta, sales have increased from 400 percent to, in some cases, 1,000 percent.

### ***Understanding consumers' perspective on food irradiation***

As supermarket chains and food distributors try to get into consumers' wallets, Dr. Christine Bruhn, is getting into their heads. As the director of consumer science at the University of California, Bruhn has researched consumer perspectives, attitudes and the awareness of food irradiation and its benefits.

Although scientists and the food industry have been aware of food irradiation for decades, consumers see this as modern science and technology. Dr. Bruhn has found that despite consumers' trust in natural or traditionally-processed foods, many seek the protection available through what they view as new or

technologically-advanced.

Dr. Bruhn reports that attitude studies and marketplace experiences with food irradiation show that most consumers respond positively to the safety benefits of irradiated food. Positive response is enhanced by the endorsement of health authorities.

The awareness of these safety benefits increases when safety is in the news. Conversely, negative communication can also impact consumer perceptions, especially when opponents to food irradiation used unscientific claims to scare the lay public of the risks associated with irradiated foods. Dr. Bruhn emphasized that the facts behind these negative claims must be revealed to help the public understand the safety and benefits of irradiated foods.

Research demonstrates that when false information is refuted, support for the process among most consumers increases above initial levels. Marketers will be interested to note that consumers' willingness to pay a premium for irradiated foods also increases.

#### **IV. International Trade Development**

##### ***USDA opening doors for irradiated fruit and vegetable imports***

In October 2002, the USDA Animal and Plant Health Inspection Service (APHIS) approved the irradiation of fruits and vegetables via regulation entitled, "Irradiation Phytosanitary Treatment of Imported Fruits and Vegetables." Dr. Alan Green, assistant administrator for APHIS, described the regulation as the allowance for irradiation to be used as an alternative to current quarantine treatments. The treatments combat 11 types of exotic fruit flies and the mango seed weevil.

As Dr. Green pointed out, the regulation recognizes the following three critical control points that must be met by irradiation treatment:

- (1) establish, through research, the dose of ionizing radiation sufficient to prevent adult emergence of the target pest;
- (2) establish through a system of dosimetry and dose mapping that the required dose is delivered accurately and consistently;
- (3) ensure through safeguards and documentation that only properly irradiated commodities are presented for export, and that safeguards prevent re-infestation by pests.

Foreign facilities exporting to the U.S. will operate under compliance agreements with their National Plant Protection Organizations (NPPO), according to Dr. Green. In addition, the NPPO will sign a framework equivalency work plan with the USDA that cites the legal authority each country has to allow irradiation as a quarantine treatment for imported fruit and vegetables, the type and level of monitoring that each country will require of the other country's irradiation treatments, and other conditions that must be established.

The USDA regulation stipulates that foreign irradiation treatments must be conducted under a pre-clearance plan that specifies the level of direct USDA oversight of the foreign irradiation treatment. The Phytosanitary Issues Management Staff of APHIS are responsible for negotiating the phytosanitary conditions for entry, including irradiation treatment, with prospective trading partners.

Through this regulation, U.S. producers have an opportunity to export products that previously lacked an effective and cost-feasible quarantine treatment.

***Thailand poised to become a leader in the export of irradiated fruit***

Mangosteen in Montreal? Durian in Detroit? Longan in Liverpool? As a country rich in its types and quantities of tropical fruits and skilled in its ability to export those fruits, Thailand is very interested in the use of irradiation in delivering quality Thai fruit across the globe.

In sending products to Australia, Europe, Japan and the United States, the Thai government has found that quarantine treatments such as fumigation or vapor heat have detrimental affects on quality of the fruit. This is where irradiation can play a key role, according to Dr. Kantathi Suphamongkhon, Thai trade representative and a special envoy of the prime minister of Thailand. Irradiation's ability to knock out pests while maintaining fruit quality is the key reason that Thailand has entered negotiations with U.S. authorities to in order to import specific types of fruits using irradiation. This comes on the heels of Dr. Suphamongkhon's welcoming the USDA APHIS's regulation to accept the use of food irradiation for imported fruits.

As Dr. Suphmaongkhon pointed out at the First World Congress, Thailand is positioned to incorporate irradiation into its ability to produce, handle and distribute fruit using good agricultural and manufacturing practices.

***With three irradiators in place and three more to come, Brazil is gearing up for increased fruit exportation***

With three irradiation facilities in place and three more on the way, Brazil is positioning itself as a key exporter of tropical fruits, according to Luis Madi, director general of the Institute of Food Technology of the State of Sao Paulo (ITAL).

Along with the current availability of Brazil's one EB/X-ray and 2 gamma machines, Madi pointed out other advantages that Brazil brings to the table. Because of very liberal irradiation regulation established in 2001, irradiation is considered a food process without limitation to commodities and maximum dose absorbed, as recommended by the Joint FAO/IAEA/WHO Study Group on High-Dose Irradiation of Food, Geneva, 1997.

In the past 5 years, the volume and value of fruits exported by Brazil has more than doubled to reach almost 700,000 metric tons in at a value of more than \$240 million USD. Mangoes from Brazil seem to be most representative of this explosive growth in exporting.

While still exported in large volume to the U.S. using hot water treatment to meet quarantine requirements, the amount of mango shipped has grown to almost 20,000 tons in 2002.

Additionally, 70 percent of all papaya sold in Europe originated from Brazil. This may be attributed to the lack of quarantine standards in Europe.

Madi made note that because of there are many varieties of tropical fruits available in Brazil all year round, the effectiveness of irradiation as a quarantine treatment against a wide variety of fruits as well as the positive attitude of the U.S. authorities toward this technology, make irradiation very appealing to Brazilian exporters. Currently, several Brazilian companies are interested in using this technology to gain market access to the U.S. The Brazilian Fruit Institute (IBRAF) is coordinating fruit exportation in

close collaboration with several research and development institutes including ITAL.

### ***R & D needed to play a key role in South Africa's irradiation venture***

As other countries enter overseas negotiations, develop facilities and tackle other barriers associated with the export of irradiated food, South Africa is returning to the roots of scientific discovery: research.

Kobus Hartman, an environmental manager in South Africa, is looking to bridge the gap between the requirements of trading partners and the resources of South Africa through research. According to Hartman, the current phytosanitary constraints of some important trading partners form a significant trade barrier to South African fresh produce. Irradiation, in addition to cold sterilization and methyl bromide applications, could contribute to bridging these constraints.

In using research as the conduit, Hartman feels that significant development is still required before irradiation can be considered as a feasible mitigation treatment for a wide variety of produce. This includes the identification of all sensitive organisms, the development of trial protocols for their treatment, fruit tolerance studies, the development of proper treatment indicators, training of the inspectorate, and the marketing of irradiated products.

In forging this development, Hartman points out that South Africa brings a lot to the table. The country has well-developed transport, communication, and banking systems; a stable economy and government; an undervalued currency; available expertise; and a strong labor force to support trade and capacity building.

The impact of overcoming these barriers to trade could be very beneficial for South Africa and its trade partners. A significant share of the potential R7 billion (700 million Euro) fruit sales from South Africa could find its way to the U.S., with a possible multiplier effect for the importing country.

### ***Supermarkets in some European countries to offer fewer irradiated foods***

Some Europeans may see fewer and fewer irradiated foods in their supermarkets, if the European Union has its way. Following the issuing of the Directives on Food Irradiation by the European Commission (EC) in early 1999, the only group of food products allowed to be irradiated and sell in all EU-wide countries was aromatic spices, herbs and vegetable seasonings. As Dieter Ehlermann, formerly with Federal Research Center for Nutrition, in Karlsruhe, Germany, explained, the EC failed to complete the "Positive List" of products allowed to be irradiated and sold in all EU countries by the deadline of end 2000. Instead, national regulations in Belgium, France, Italy, Spain and the United Kingdom, which were established before the EC Directive entered into force, were allowed to continue. The chance to achieve a harmonization of regulation in the EU is getting more remote as even now no agreement was reached on the "Positive List."

The future for irradiated foods in Europe appears bleak, if current legislation is used as an indicator. Several countries that are expected to join the EU beginning in 2004 have already surrendered their laws to the EU by banning irradiated foods previously approved by them. The outcome is that the chance to achieve harmonization on regulation on food irradiation in EU would be even more remote. Together with strict labeling requirements in the EU, the quantities of irradiated foods produced in Europe have declined in recent years.

Ehlermann stated that the EC Directives are not in accordance with the principle of the Codex General Standard for Irradiated Foods. However, no country plans to challenge the EC under the WTO

provisions, as there appears to be a low economic incentive to do so.

### ***Health Canada considering amendment on food irradiation***

Irradiated food poses no health hazards, does not significantly reduce nutrient levels, and could improve food safety. These findings by Canadian officials have been incorporated into a proposed amendment on food irradiation, according to Ray Klassen, scientific evaluator for Health Canada.

Klassen explained that in November 2002, the proposed amendment was issued to Health Canada's regulation on food irradiation. The amendment evolved from a formal request for approval of irradiated fresh and frozen shrimp, fresh and frozen ground beef, fresh and frozen poultry, and mangoes, and was issued together with the Recommended Canadian Code of Practice for Food Irradiation.

Along with the aforementioned findings, the proposed amendment states that food irradiation could extend product shelf life and reduce insect infestation, while the rules of safe food handling still need to be followed.

A series of eight public information sessions on the proposed amendments were held in different parts of Canada. Currently, Health Canada is evaluating the comments that have been received and will incorporate necessary changes in the proposed amendment based on sound science, international developments and any new scientific findings. The decision to make any change in the regulation will be made by the minister of health.

If affirmative, the revised regulation will be advanced to Special Committee of Council for consideration, and if a favorable decision is made, published in the Canadian Gazette.

### ***Communicating irradiation benefits the aim of proposed International Council***

The increasing demand for food safety and security from farm to fork and the globalization of trade in food and agricultural commodities represent new challenges to the food industry. In addressing these challenges from a food irradiation perspective, the call to establish an International Council on Food Irradiation (ICFI) is being voiced by two irradiation researchers.

Martin Satin is the former chief of the FAO's Agro-Food Industry and Post-Harvest Management Service, and the former executive director of Agri-Business Institute of Management Association (IAMA). Paisan Loaharanu is the former Head of the Food and Environmental Protection Section, Joint FAO/IAEA Division. Satin and Loaharanu see the establishment of the ICFI as a stepping stone towards achieving a safe and wholesome food supply that is sensitive to the needs of consumers, and is environmentally responsive and sustainable.

Satin said it is imperative that all stakeholders in the food industry -- from producers to processors, distributors and consumers -- work closely to ensure the safety, quality and integrity of our food supply. With persistent product recalls and food-borne illnesses resulting from pathogen contamination, liability and an increased risk to hard-earned reputations have become major concerns to all sectors of the food industry.

In addressing these concerns, the goal of the ICFI is to bring together business leaders from all parts of the agri-food chain, along with researchers, government policymakers and other concerned stakeholders. The purpose is to stimulate strategic approaches to communicating the benefits of irradiated foods to consumers and the industry.

***Food irradiation education will be available online in National Food Safety and Toxicology Center course***

Irradiation is going online, thanks to a new component of an online educational program at Michigan State University (MSU).

The Online Professional Master of Science (proMS) in Food Safety Program developed by the National Food Safety & Toxicology Center (NFSTC) at MSU features electives related to food safety. Beginning with the fall 2003 semester, food irradiation will be available as a new elective.

The course will feature 11 modules on different aspects of food irradiation. The modules are developed by an internationally-recognized panel of experts on the subject, and will include sound scientific background and up-to-date information.

Developing leaders and educators for the international development of a safer food supply is an aim of the ProMS course, according to Dr. Edward Mather, deputy director of the NFSTC. The ProMS program is the only opportunity in the world that provides an online outlet for earning a master of science degree in food safety.

## **V. Recommendations**

Based on presentations and discussions at the Congress, the following conclusions and action plans were developed:

- Four decades of scientific studies conducted by national and international experts, show that food irradiation is safe and effective and provides nutritional adequacy
- Irradiation can be applied widely as a sanitary and phytosanitary treatment for a wide variety of foods, making its role as a science-based process unique
- Irradiation is a food process endorsed by the Codex General Standard for Irradiated Foods, and should be seen as a process, not an additive, by national food regulatory agencies
- The volume of irradiated food being marketed has increased significantly in recent years, but the full-market penetration is still small and growth potential is high. Led by major food and agriculture trade associations, food processors, irradiation equipment and service providers, and major retail chains, the number of supermarkets that offer irradiated meat products has increased in just three years from 84 to more than 7,000 from approximately 50 retail chains. Nearly 2,000 restaurants including those belong to a major fast food chain, are serving irradiated meat.
- An increasing public awareness of foodborne illnesses and deaths, major food recalls, and the liability to various sectors of the food industry have prompted the food industry and consumers to adopt food irradiation as an effective technology to guard against foodborne illnesses
- Irradiation as a phytosanitary treatment is making an impact, following the recent introduction of irradiated fruits from Hawaii in several major retail chains in the U.S. Several countries including Brazil, Chile, Mexico, South Africa and Thailand are preparing to export irradiated fruit to the U.S. following the approval of irradiation phytosanitary treatment by the USDA/APHIS in October 2002.

- With increasing demands by regulatory authorities on food safety from “farm to fork” and the globalization of food trade, a concerted effort is urgently needed to communicate the effectiveness of irradiation as a sanitary and phytosanitary treatment to all stakeholders in the food industry, including producers, processors, distributors and consumer organizations. Leading educators can significantly assist in this public information campaign.
- Accurate information must be provided to consumers for them accept food irradiation
- Irradiated foods must be in the market to allow consumers that choice

## **VI. Tour of Commercial Food Irradiation Facilities, May 7, 2003**

Approximately 60 Congress participants joined the tour to visit two commercial food irradiation facilities in the Chicagoland area: (i) IBA/GUARDiON, which operates a large gamma irradiation facility in Schuamberg, Ill., and (ii) SureBeam Corp.’s Glendale Heights, Ill., facility, which is using EB/X-ray technology for irradiating food. Participants received details on the technical capabilities and equipment of these facilities and also how these two different technologies are being used for irradiating different types of food products. The tour provided the participants with much needed information and contributed effectively to a better understanding of food irradiation technology.

## **VII. Media Coverage**

A feature of the Congress was its wide interest in and participation by more than 25 representatives of the media, representing both the daily prints and food trade journals. More than a dozen news stories followed the event, from sources including Reuters and meat and food trade journals.

- [U.S. meat companies slow to use irradiation – USDA](#) (Reuters)
- [Is education key to acceptance of irradiation?](#) (FoodProductionDaily.com)
- [Get serious about irradiation](#) (Factiva)
- [Murano Says Farm-to-Fork, Fast Track on Antimicrobial Approvals Are Key to FSIS Food Safety Strategy](#) (AMI)
- [SPECIAL FOOD IRRADIATION CONGRESS REPORT: Murano mulls irradiation costs](#) (MeatingPlace.com)
- [Irradiation is Up-and-Coming: Use of irradiation technology is essential for the food industry, conference hears](#) (Meat News)
- [Irradiated Ground Beef At Retail Marks 3rd Anniversary](#) (Cow-Calf Weekly)
- [US Farm Report](#)
- [FOOD EXPORTS - Thai fruits ready for US shelves](#) (Factiva)
- [Green light for irradiation?](#) (Food Quality News)
- [USDA wants irradiated meat: School lunch programs could get it next year](#) (Detroit Free Press)

- USDA Food Safety Chief Murano Champions Irradiation (Food Protection Report)

These are just a few of the headlines that appeared in international media sources following the Congress, particularly with the recent decision to include irradiated food in school lunch programs.

**Author:** Paisan Loaharanu

**Editors:** Kirsten Khire, Trent Wakenight, Dr. Ewen C.D. Todd

**References:**

World Trade Organization web site [http://www.wto.org/english/tratop\\_e/sps\\_e/spsund\\_e.htm](http://www.wto.org/english/tratop_e/sps_e/spsund_e.htm)

SureBeam web site [http://www.surebeam.com/how\\_it\\_works.php](http://www.surebeam.com/how_it_works.php)

Food Technology Service web site <http://www.foodtechservice.com/>

USDA web site [www.usda.gov](http://www.usda.gov)

Paisan Loaharanu wishes to express his personal appreciation in particular to Drs. Tim Hammond and Jill Hollingsworth of FMI, who had been supportive of the organization of the Congress from the very beginning, and to Dr. Ewen C.D. Todd, director of NFSTC, for his leadership, and to Kirsten Khire, director of communications, NFSTC, who devoted a great deal of her time to ensure that the effective organization of the Congress. He also thanks all contributors including MDS Nordion, National Food Processors Association, IBA/GUARDiON, SureBeam, Minnesota Beef Council, W.W. Johnson Meat Company, Colorado Boxed Beef, and Hawaii Pride for their strong support to the Congress.

Special thanks to all the speakers and sponsors of the First World Congress on Food Irradiation.