



Using food irradiation technology to achieve food safety and security in Asia and the Pacific

The challenge

In the Asia and the Pacific region, the impact of climate change and global warming will have a negative effect on regional food supply (production, losses and wastage) and on trade in food within and beyond the region. The expected population growth in the Pacific region will also exacerbate the problem.

Food wastage and losses are already a problem and the risk of this worsening is significantly increased by climate change. In some locations, it has been estimated that post-harvest losses could be as high as 30-40%. Food irradiation can be used as an adaptive climate change strategy to address these losses. Food irradiation is a radiation processing method that can decrease food-borne diseases, improve food security, protect trade through effective sterilization of insect pests of economic importance, and provide shelf-stable emergency rations. However, despite its potential benefits, food irradiation remains an underutilized technology in the Asia and the Pacific region, and its potential benefits as an adaptive climate change approach are not widely known.

The project

The Regional Cooperative Agreement for Research, Development and Training Related to Nuclear Science and Technology for Asia and the Pacific (RCA) proposed a regional technical cooperation project to increase awareness and utilization of food irradiation. Launched in 2014 with experts in food irradiation and policy specialists in climate change and food security, the project activities enhanced climate change professionals' understanding of food irradiation technology through the development and dissemination of information materials including brochures, video clips and fact sheets. The project successfully supported engagement between nuclear technology researchers and climate change groups, and introduced the benefits of the technology as a measure to adapt to climate change. Events organized in participating Member States included awareness seminars on radiation processing technology and a research forum for science and technology in Myanmar in 2017, statements at 'Fruit Indonesia 2016', and a national seminar on food irradiation in Indonesia in 2017. In addition, Indonesia participated in a Coordinated



Hands-on demonstrations provided decision makers and scientists with technical knowledge of the techniques available. (Photo: IAEA)

Research Project on the development of electron beam and X ray applications for food irradiation in France in 2017. A presentation on this work and the possibilities for food irradiation was also awarded a prize for the quality of the presentation at the 2nd International Conference on Climate Changes-2018, Sri Lanka.

The impact

Through the project, a regional resource document was developed to inform senior officials of the benefits of radiation technology. It is a valuable basis for further interaction with climate change officials and organizations. Awareness among officials and agencies responsible for climate change policies about the role of food irradiation in climate change related food security has increased. This has been confirmed by surveys conducted in all participating countries which indicate an increased awareness and interest in radiation processing of food.

For example, in Mongolia, increased knowledge on the benefits of food irradiation enabled authorities to begin drafting national regulatory framework laws in order to benefit fully and safely from the technology and conduct its own research. In addition, irradiated Indian mangoes were exported to the USA for the first time ever in 2016 by sea and not by air, due to their longer shelf life. As a result, mango exports to the USA increased by 133%: a record 765 metric tonnes were exported. India is also now able to ship pomegranates to the US market.

In the Philippines, a feasibility study on establishing a commercial irradiation facility was carried out, and several major private investors have indicated strong interests to put up a commercial facility in the country. Ready-to-eat irradiated food for victims of calamities are being developed in China, India, Indonesia, the Philippines, Pakistan and Sri Lanka.



Project participants from relevant ministries visited a gamma irradiation facility in the Philippines to learn more about the positive benefits of food irradiation. (Photo: IAEA)

PROJECT INFORMATION

Project No: RAS5071

Project title: Strengthening the Adaptive Climate Change Strategies for Food Security through the Use of Food Irradiation (RCA)

Duration: 2015-2017 (3 years)

Budget: €200 000

Contributing to:



Partnerships and counterparts

This project was carried out under the RCA regional partnership. It had a strong partnership component, and forged networks with counterpart institutions in participating Member States so that the knowledge and access to experts will be used in future undertakings. Partner organizations have increased confidence in working together. Finally, interregional and national cooperation has resulted in the identification of new ideas and revealed unforeseen solutions to problems.

The science

Food irradiation can reduce the risk of food-borne diseases such as E. coli and can prevent the spread of exotic insects facilitated through global trade. Irradiation can also extend the shelf life of food by destroying microorganisms that cause decay, such as mould. The irradiation process involves exposing foodstuffs to electromagnetic rays, high-energy photons or beam of particles (X-rays, gamma photons or electron beams). The process does not leave behind any radioactivity, does not increase temperature and uses no harmful additives. Food is not cooked and, crucially, remains free of chemical residues that would have been added in a chemical preservation process.