

Feature Article

e-Learning Course on Food Irradiation

Technical Officer: Yves Hénon

The growing popularity of e-learning can be explained by its many advantages such as¹:

- Information can be provided as and when needed and can be accessed wherever a computer with an internet connection is available.
- Training can be scheduled around work and personal responsibilities.
- Immediate access to additional online resources can be embedded directly into the course.
- Costs associated with third party trainers or remote training (travel time and expenses) are reduced.
- Self-paced learning modules allow users to learn at their own pace.

Since May 2015, an online, interactive, multi-media and self-study course on *Food Irradiation - Technology, Applications and Good Practices* has been made available by the Food and Environmental Protection Section.



This e-learning Course on Food Irradiation was initiated during a project (RAS/05/057) of the Regional Cooperative Agreement (RCA) *Implementing Best Practices of Food Irradiation for Sanitary and Phytosanitary Purposes*.

During a consultant meeting held in Vienna in July 2014, the concept of the course was refined. It was agreed that the course would be for different audiences:

- The general public, in order to provide an easily accessible source of scientific information. Information on food irradiation is abundant but scattered and much of what can most easily be found on the Internet is often of a non-scientific nature. No recent publication offers to non-specialists a general view of the topic.
- Operators of irradiation facilities, in particular those in developing countries, who will find practical tips to improve their practice and to comply with international standards.
- Academics who could use it as a source of teaching material;
- Food policy makers and inspectors who could use the course to make informed decisions and obtain guidance for the audits of irradiation facilities;
- Potential users of irradiation who could thus get a better understanding of the technology.

Based on the category that they select, users are given access to different sets of modules. Using the ISO 14470-2011² standard and the *Manual of Good Practice in Food Irradiation*³ as references, the course was divided into 10 modules.

Modules	General Public	Academia	Users or potential users of irradiation processing	Food regulators and inspectors	Operators of irradiators
01 - Food Irradiation	✓	✓	✓	✓	✓
02 - Irradiation facilities	✓	✓	✓	✓	✓
03 - Dose		✓	✓	✓	✓
04 - Validation				✓	✓
05 - Product characterization		✓	✓	✓	✓
06 - Process Characterization		✓	✓	✓	✓
07 - Quality management			✓	✓	✓
08 - Monitoring and control				✓	✓
09 - Process effectiveness				✓	✓
10 - Audits			✓	✓	✓

² Food irradiation - Requirements for the development, validation and routine control of the process of irradiation using ionizing radiation for the treatment of food

³ Technical Reports Series no. 481, International Atomic Energy Agency, Vienna, 2015

¹ HRTribe, Stephanie Reyes, 2015

Each module contains:

- A lesson, largely based on the *Manual of Good Practice in Food* except for the first part (Food Irradiation) for which expanding the contents and addressing frequently asked questions seemed necessary. The latest chapters will help operators of irradiation facilities to appreciate and improve their practices.
- A section called ‘Essentials’ that summarizes the key points.
- A quiz to assess the knowledge acquired by the user from the course material. The quiz questions take a variety of forms: answer matching, multiple choice, true or false, picture selection, or simple calculation.

Videos, Power Point presentations, pdf files and pictures enrich the contents. The course includes a glossary and approximately 80 downloadable references. These references cover safety of irradiated food, effects of irradiation on the nutritional quality of food, effects of irradiation on food microorganisms, insects and parasites, effects of irradiation on parasites, sanitary and phytosanitary applications of irradiation, packaging of irradiated food, food irradiation standards and regulations, history of food irradiation, and communication aspects.

A survey with general and simple questions regarding food irradiation was included before and after the first two lessons (Food Irradiation and Irradiation Facilities) to assess the progress and the evolution of the user’s opinion on irradiated food. The table below shows this evolution for two of the questions (based on data collected in early December 2015). The table below shows this evolution for two of the questions (based on data collected in early December 2015).

Irradiated food is radioactive	Before	After
Never	78%	97%
Maybe	14%	-
For a short time	7%	3%
Always	2%	-
Whenever irradiated food is sold and labelled as irradiated, people will buy it	Before	After
I don’t believe it	8%	3%
Hard to believe	33%	15%
I believe it	59%	82%

Users having access to all lessons may obtain a uniquely numbered completion certificate valid three years under the conditions that all lessons have been taken and that the mark is over 80% for each of the ten quizzes.

At the end of the course, feedback, comments or suggestions can be provided. All comments have so far been positive regarding the quality of the learning material (62% very satisfied and 38% satisfied), the volume of the learning material (38% very satisfied and 62% satisfied),

the course interactivity (46% very satisfied and 54% satisfied), the appropriateness of tests (31% very satisfied and 69% satisfied). A majority of users were very satisfied with the ease to use the platform.

The platform for the course was provided by the Nuclear Knowledge Management Section (NKMS) of the IAEA who maintains the state-of-the-art Cyber Learning Platform for Nuclear Education and Training (CLP4NET) to deliver e-learning to the Member States. NKMS also offered expert advice on course development and assisted with two pilot runs intended to review and improve the course during two meetings on food irradiation in the Asia-Pacific region.

In the first six months since it has been available, the site of the e-learning course has been visited by hundreds of individuals from 44 Member States with nearly 200 of them taking all or part of the course for a total of several hundred learning hours. A dozen individuals have obtained their completion certificates. The course is already in use in irradiation facilities as a training tool. The Food and Environmental Protection Section now asks attendants to some of its meetings to take specific lessons as a prerequisite.

One of the advantages of such an e-learning course is that its contents can be regularly updated and enriched. Consequently the course should improve with time. As part of the Technical Cooperation Project RLA 5066, a Spanish version of the course will be available in 2016.

Feedback from users:

Simple and attractive.

Really innovative awareness programme on food irradiation for layman and even for experts.

Very interesting experience.

I learned a lot. The course is very good.

The tests helped improve my knowledge.

Excellent course.

A very good and pleasant experience.

To access the course: <http://bit.do/iaeafoodirradiation>

