Title: Application of different analytical methods for the detection of irradiated foods

Duration: Ten-day training Workshop

Language: English (also available in other languages)

CPD: 10 credited hours – IFPH

Location & Dates:
- Istanbul (First Monday every month)
- London (Second Monday every month)
- Dubai (Third Monday every month)
- Brunei (Fourth Monday every month)

Please note: ON-Demand: IFPH and potential participant/partner can agree other duration/date/locations than those stated above

Delivery Type: Group - Live

Prerequisites: None

Who should take this training workshop?
This course is especially aimed towards Food Scientists and Manufacturers around the world. The participant in this training course will have the opportunity to work with members of our food control, safety and hygiene team on various regulatory issues in food safety and especially risk assessment, risk management and risk communication.

Fees in GBP (£): - - - (to be decided)

Email: apply@ifph.org

Including coffee breaks and a lunch daily

Course Rationale
Food irradiation as a robust method of food preservation has significant public health potential by the reduction of pathogenic microorganisms in solid food. Its introduction into practice has been slow because countries have required comprehensive data to support the wholesomeness of irradiated food and adopted lengthy regulatory procedures.

There is little doubt that one of the principal concerns regarding the acceptance of irradiated food by governments, industry and consumer is the lack of simple and rapid methods for the identification, surveillance and control of such food. The Codex Alimentarius Commission (CAC) has its primary objectives in protecting consumer health and ensuring fair practices in food trade especially the irradiated food. Consequently CAC provided an important incentive for national authorities to introduce regulation on food irradiation through establishing simple and reliable analytical methods to measure chemical changes in irradiated food.
To address the emerging needs for identification of irradiated food, IFPH, London, will conduct a ten-day training course with a focus on safety of food irradiation, legal status, and the rapid analytical techniques employed for its detection.

This program will provide hands-on training and experience in various issues of food irradiation in both public and private sector settings. Information packages on each of the course components will be provided to participants.

**Learning Objectives**

By the end of the training-workshop, participants will be trained on:

<table>
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<tr>
<th>Day</th>
<th>Theoretical</th>
<th>Hands-on Practical</th>
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| 1 & 2 | i. International Food System and Trade.  
| 3   | i. Safety and Legal Status of Food Irradiation  
ii. Toxicological studies of irradiated food. | Extraction of Radiolytic Markers.                      |
| 4   | i. Effect of Radiation on Food Constituents.  
ii. Microbial and Chemical Hazards. | Clean up procedures of radiolytic extracts.  
Identification using GC-MS. |
| 5 & 6 | i. Regulatory, policy issues in food irradiation.  
Troubleshooting and evaluation |
| 7 & 8 | Effect of Storage and Cooking on radiolytic markers. |                                                          |
| 9 & 10 | i. Nutritional Quality of Irradiated Food.  
ii. Consumer acceptance of irradiated food. |                                                          |

The topics below are to be covered while the hands-on training programme is progressing

**Day One and Two:**

- Historical Background on Food irradiation  
- Sources of Ionising Radiation  
  - *Electron Radiation*  
  - *Gamma Radiation*  
- Uses of Food Irradiation  
- Radiation Dose  
- Radioactivity versus Irradiation  
- Food Irradiation Benefits  
  - *Preservation*  
  - *Sterilization*  
  - *Control Sprouting, Ripening and Insect Damage*  
  - *Control Foodborn Illness*  
- International Food System and Trade  
- Development of Potential Post Irradiation detection methods

**Day Three:**

- Safety of Food Irradiation  
- Legal Status of Food Irradiation in the United Kingdom
Legal Status of Food Irradiation in the United States
UK Food Irradiation Licences
Labelling of Irradiated Foods
Toxicological Studies of Irradiated Foods
  o Subchronic Studies
  o Chronic Studies

Day Four:
  Effect of Radiation on Food Constituents
    o Radiolysis of Amino Acids
    o Radiolysis of Carbohydrates
    o Radiolysis of Oils and Fats
  Effect of ionising radiation on vitamins
Microbial and Chemical Hazards
Identifications methods Based on microbiological effect

Day Five and Six:
  Radiation Chemistry of Foods
  Radiolytic Products
  Free Radicals and their Reactions
  The Production and Properties of Free Radicals
  Typical Reactions of Free Radicals
  Irradiation Parameters

Day Seven and Eight:
  Effect of Storage on Cyclobutanone Levels
  Effect of Cooking on Cyclobutanone Levels
    o Roasting
    o Boiling
    o Microwave

Day Nine and Ten:
  Nutritional Quality of Irradiated Food
  Consumer Acceptance of irradiated Foods
  Troubleshooting and Evaluation.