

FOOD AND ENVIRONMENTAL PROTECTION

NEWS



LETTER

Joint FAO/IAEA Division
of Nuclear Techniques
in Food and Agriculture
and FAO/IAEA Agriculture and
Biotechnology Laboratory, Seibersdorf
International Atomic Energy Agency
Vienna



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TO THE READER

Dear Colleague

This issue reports a number of recent developments in the Work of the Food and Environmental Protection sub-Programme in the past year. We sincerely regret that the unforeseen shortage of staff during the year has resulted in delays in implementing many activities with a few remaining staff in both Professional and General Service categories. As a result, the Newsletter which was expected to be published in July 2000 could not be finalized for publication.

Several significant events on food irradiation took place in the past year. Particularly important was the ICGFI Workshop on Trade Opportunities for Irradiated Foods held in conjunction with the APEC Workshop on Alternative Quarantine Treatments and Post-Harvest Handling Methods, Kona, Hawaii, USA, 22-24 May 2000. At these workshops an action plan was developed to expedite international trade in irradiated food. The reader is invited to read the excerpt of this Workshop, the full report of which is available on request. By coincidence, the representative of the USDA/APHIS announced at this Workshop the publication of its Proposed Rule on Irradiation Phytosanitary Treatment for Imported Fruits and Vegetables to meet quarantine requirements in the USA with regard to 11 species of fruit flies and mango seed weevil. The summary of the Proposed Rule which was published in the Federal Register on 26 May 2000 is included in this issue. The reader will also be interested to read about the rapid commercialisation of food irradiation in the USA in this issue which describes how the USA is moving ahead on commercializing irradiated food in a big way.

With regard to the activities of the FAO/IAEA Training and Reference Centre for Food and Pesticide Control (TRC), two training workshops related to QA of pesticide residue and mycotoxin analyses were held this year with plans to convene further training activities next year. In addition, the INFOCRIS which has been on line for some time, is now available both in English and Spanish.

The Section welcomes two new staff members: Ms. S. Attakpah (Ghana) who joined as a secretary on 1 February 2000 and Dr. B. Doko (French/Benin) who joined as a technical officer in charge of mycotoxin analysis of food in June 2000. In addition, Dr. Paul Thomas (India) rejoined the Section as a consultant on food irradiation from April to November 2000 and Dr. Ken Newton (Australia) provided short-term assistance on food microbiology activities.

P. Loaharanu
Head
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A. STAFF

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B. FORTHCOMING EVENTS

Second FAO/IAEA Research Co-ordination Meeting (RCM) on Classification of Soil Systems on the Basis of Transfer Factors of Radionuclides from Soil to Reference Plants, Vienna, Austria, 12-16 March 2001

This meeting will be held in Vienna, Austria from 12 to 16 March 2001. All contract and agreement holders (at present 12 contracts and 3 agreements) will be invited to participate in this meeting. The purpose of the meeting is to evaluate the progress of the Co-ordinated Research Project (CRP) to date and to discuss the workplan for the next project year. Research data on TFs of Cs-134 and Cs-137, Sr-85 and Sr-90 along with other radionuclides based on selected soils in pot and field studies with broad-leafed crop plants, e.g. cabbage and wheat, will be presented at the meeting. The results (including the raw data) are also expected to be presented on specifically developed data sheets well before the meeting to enable us to analyse the outcome of the CRP beforehand.

As agreed at the first RCM (Izmir, Turkey, April 1999), inter-calibration reference samples (RMs) for Cs-137 and Sr-90 in both soil and vegetation were sent to each participant for analysis in May this year. Necessary instructions were provided to the participants for analysis of alpha, beta and gamma emitting isotopes in the Reference Materials under the proficiency test programme to ensure quality of research data being generated by these laboratories. In addition, these procedures would enhance the received worth of the CRP to external reviewers. The results will also be included in the meeting report. It may be mentioned here that the RMs were supplied to all 15 participating laboratories with assistance from the Agency's Seibersdorf Laboratories. Results of the analysis from most of the laboratories have already been received on a supplied reporting form.

FAO/IAEA(RCA) Project Co-ordination Meeting on Application of Irradiation to Food Security, Safety and Trade, Bangkok, Thailand, 17-20 April 2001

This regional meeting is tentatively planned for Bangkok to finalize the work plan to be carried out during the next two years. The specific objectives of this regional project for Asia and the Pacific are to demonstrate the effectiveness of irradiation to improve food security, safety and facilitate intercountry trade in food products of economic importance to the region. Specific training/workshops will be organized to enhance public acceptance of irradiated food, operation and maintenance of irradiation facilities available for food irradiation, and intercountry trade trials in irradiated food will be implemented.

FAO/IAEA Training Workshop on Quality Control of Commercial Pesticide Products, Velence, Hungary, 18 April – 5 May 2001

The objective of this workshop is to introduce the concept of multi-pesticide analytical procedures, advanced laboratory methodology, instrumental techniques used in the analysis of pesticide formulations and elements of quality control quality assurance of the analytical procedures and laboratory operations. The programme will comprise of lectures explaining the principles and related theory of operation, complemented with extensive laboratory exercises in subgroups of 4 analysts, elaboration of worked examples and consultation.

The workshop is open to analysts from Member Countries of FAO and IAEA. These analysts should come from laboratories authorised by Governments to perform official control of pesticides. The deadline for nomination is 31 January 2001. The minimum requirements are: BSc degree in chemistry, 2 years experience in pesticide formulation analysis, sufficient knowledge in English to be able to follow the course and to express themselves in that language. The nominations may be submitted by the Heads of nominating institutions through the FAO Representative, FAO National Committee or National Atomic Energy Authority.

The nominations together with the completed questionnaire and Language Proficiency Certificate, issued by a language school, cultural institution or the British Embassy, should be returned at the latest by 31 January 2001 to:

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Head Agrochemicals Unit
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Advanced nominations by facsimile or e-mail are welcome.

First FAO/IAEA Research Coordination Meeting (RCM) on Quality Control of Pesticide Products, Velence, Hungary, 7 – 11 May 2001

The objective of the Co-ordinated Research Project (CRP) is to adapt and validate analytical methods and associated QA/QC procedures for the determination of the active ingredient content of a number of pesticide products under the same instrumental operation conditions to increase the output of the laboratories and reduce the cost of the analyses.

During the meeting, the technical details of the methodology will be discussed and the work plan of the participants will be agreed. It is expected that the RCM will be attended by 10 research contract and two agreement holders.

We could still accommodate a few more projects under the scope of this CRP. Laboratories which are interested in collaborating in the project may submit proposals until end February 2001. Detailed information may be obtained from the Home Page of the TRC www.iaea.org/trc or A.Ambrus@iaea.org.

C. PAST EVENTS

Second RCM on Alternative Methods to Gas and High Performance Liquid Chromatography of Pesticide Residues in Grains, Laguna, Philippines, 6-10 March 2000

The meeting was held at the National Crop Protection Center of the University of the Philippines at Los Baños, College, Laguna, Philippines from 6 to 10 March 2000. Contract holders from Argentina, China, Croatia, Hungary, India, Pakistan, Panama, Philippines and Turkey attended the meeting. Dr. Eliseo P. Cadapan, Director, National Crop Protection Center welcomed the participants. Mr. Arcadio Cruz, Programme Officer, FAO Philippines delivered an opening speech. Dr. Leonila M. Varca hosted the meeting.

The contract holders reported their results. The presentations were followed by extensive discussions. In the laboratory of Dr. Varca the three key detection methods were carried out by the contract holders who joined the project later. The laboratory experiments provided a good opportunity to demonstrate the practical tricks that the participants of the project found useful, and to test the reproducibility of the detectability of marker compounds under very humid and warm conditions. The results proved that the methods developed are robust and can be performed with limited equipment under extreme laboratory conditions. In spite of the difficulties encountered in procuring the chemicals and reagents at the beginning of the project, several participants made very good progress. The results indicate that, if all participants perform their allocated tasks, by the end of the project a practical and low cost alternative procedure will be available for laboratories with limited instrumentation to screen the samples for about 110 pesticide residues and/or confirm the identity of the detected residues.

Two days of the meeting were devoted to planning and detailed discussion of the work programme for the next two years. The programme was designed to validate the method for 18 active ingredients, confirm the minimum detectable quantity of over 59% of the detected pesticides, and enable the statistical assessment of the within and between laboratory reproducibility of the method. The participants were eager to demonstrate the reliability of the method with inter-comparison studies.

Food Irradiation 2000: Bringing a New Food Safety Process to Market, Washington, D.C., USA, 3-5 April 2000

This Conference was organized by InterTech Corporation, Portland, Maine and was held in Washington, D.C., 3-5 April 2000. It was attended by over 100 participants who were from regulatory authorities, food manufacturers and distributors, radiation processing companies and academic institutions. The main purpose of the Conference was to assess the role of irradiation as a new food safety technology in the light of the recent approval of

irradiation of red meat by the USDA and the increasing interest of the food industry in using this technology to ensure microbiological safety of food. A large number of the participants were from the food industry which has an interest in using this technology to ensure microbiological safety of their products, especially meat and meat products. It was clear that major meat processing companies including Tyson Foods, Cargill/Excel, Iowa Beef Packer, etc. have already agreed to use this technology to ensure zero tolerance of *E. coli* 0157:H7 of their meat products as required by the USDA's regulation. Several large commercial irradiators, using both electron and gamma radiation sources, have been either constructed or being constructed to serve the need of the meat industry. Approximately 2,000 tons/week of ground meat were planned to be irradiated at a new commercial EB irradiator in Iowa the week following the Conference for marketing in the mid-West especially in Minnesota, starting mid-May 2000. Large retail food chains including Wal-Mart and Super-Value have announced that they will carry irradiated food at their stores.

The Conference was therefore held amid the atmosphere of optimism by those who have been involved in research, development, marketing, regulatory process of irradiated food. The speaker from the FDA stated that six petitions on the use of irradiation for various purposes have been filed with the FDA in the past two years. FDA agreed to put those petitions which could lead to improving food safety on a fast track. The food industry and academia in the US have created a "Coalition for Food Irradiation", based at the National Food Processor Association, to ensure an active co-ordination on this subject.

FAO/IAEA Consultants' Meeting on Quality Control of Pesticide Formulations, Vienna, Austria, 10-14 April 2000

The use of pesticides in agriculture over the last several decades has played an important role in enhancing agricultural production and protecting health of humans and animals. Pesticide use in developing countries is increasing because of vital national concern for increased agricultural production and reduced post-harvest losses. The use of sub-standard pesticide products may reduce efficacy, lead to resistance, and result in increased risk to human health and the environment while wasting national resources. Products of inferior quality may include imported and locally produced pesticides as well as degraded, expired and smuggled products.

An effective pesticide product quality monitoring capability will enhance national capability to insure more efficient pest control and reduce undesirable side effects on human health and the environment. However, most of the developing countries lack an effective pesticide product quality monitoring capability. The Joint FAO/IAEA Programme has initiated this Co-ordinated Research Project (CRP) to strengthen national capability in this area. A group of consultants were invited to advise the sponsoring Organizations on the implementation of the CRP.

The consultants assisted the staff in the developing a logical framework for the CRP and identified relevant issues that need to be addressed by technical contracts before the first RCM. It was recognized that most of the CIPAC-AOAC methods of analysis were validated for the analysis of individual pesticides. Whilst this approach is suitable for pesticide manufacturers and suppliers of a limited range of specific products, national pesticide product analysis laboratories must control several hundred pesticide formulations. This, in turn, requires the use of a variety of solvents, chromatographic columns and other supplies, resulting in increased cost and time. The use of a 'multi-analyte' method, on the other hand, would reduce cost and save time.

Such methods would be useful in the laboratories of developing countries. However, there are only a few official CIPAC-AOAC methods of analysis which can be characterized as "multi-analyte" methods. In view of this deficiency, the consultants recommended that the CRP participants individually adapt a selected number of official CIPAC-AOAC methods for pesticide formulation analysis and verify the applicability of the multi-analyte methods by comparing the active ingredient content of commercial pesticide formulations determined with the CIPAC and multi-pesticide methods. The multi-pesticide method may be subjected to 2nd or 3rd laboratory verification in compliance with the AOAC peer verified method programme (PVP). Finally, the peer verified methods should be submitted to CIPAC for adoption. CIPAC and AOAC will be invited to participate in the CRP.

The consultants believe that the multi-analyte methods validated through this CRP will enhance national capabilities for pesticide product quality control, and facilitate monitoring compliance with FAO Specifications and International Code of Conduct on the Distribution and Use of Pesticides. Evaluation of the applications and planning for the first research co-ordination meeting/training workshop is currently underway.

Final FAO/IAEA Research Co-ordination Meeting on Development of Safe, Shelf-Stable and Ready-to-Eat Food through Radiation Processing, St. Hyacinthe, Canada, 10-14 July 2000

The final RCM was held at Food Research and Development Centre, Agriculture Canada, St. Hyacinthe, near-by Montreal, Canada, 10-14 July 2000. It was attended by 12 participants who are research agreement or contract holders (two participants were unable to attend for health reasons). The meeting reviewed the achievements and results of the entire CRP.

The results showed that irradiation can ensure microbiological safety and/or extend shelf-life of a number of chilled, ready-to-eat food products including pre-packed, prepared vegetables and some sous-vide meals, prepared meals, smoked sausages and ham, and food for immuno-compromised patients/population such as fruit salad in gelatin, ice-cream, Caneloni, etc. A predictive model for irradiation inactivation of pathogenic bacteria and other inhibiting factors in food stored at a temperature ranging from -76° to $+20^{\circ}$ C was developed. A number of safe, shelf-stable sterile meat products such as chicken chilli, salami and sausages, mutton chilli, luncheon meat were developed in India as well as shelf-stable sterile ready-to-eat meals in South Africa through the combination of mild heat, freezing and high-dose irradiation. In addition, a number of shelf-stable non-sterile products were developed through the combination of reduced water activity, vacuum packaging and irradiation with 10 kGy dose to extend shelf-life at an ambient temperature up to 9 months with little change in quality. Microbiological safety and significant shelf-life extension of semi-dried, ready-to-eat traditional food products marketed at ambient temperature in some Asian, African and European countries were achieved through irradiation with a dose of up to 10 kGy. A number of packaging materials required for different types of irradiated food were evaluated and quality assurance guidelines for selecting packaging materials were developed.

FAO/IAEA (RCA) Regional Workshop on Public Information on the Use of Irradiation as a Sanitary and Phytosanitary Treatment of Food, Kuala Lumpur, Malaysia, 7-9 August 2000

The Regional Workshop on Public Information on the Use of Irradiation as a Sanitary and Phytosanitary Treatment of Food was held in Kuala Lumpur, 7-9 August 2000 in co-operation with the Malaysian Government through the Malaysian Institute of Nuclear Technology (MINT), Kuala Lumpur, Malaysia. The Workshop was attended by 24 participants, most of whom were journalists, representatives of consumer organizations and senior policy makers in governments of RCA Member States. The purpose of the Workshop was to inform senior journalists/science writers and representatives of national consumer organizations in countries in Asia and the Pacific of the safety and benefits of irradiation as a sanitary and phytosanitary treatment of food and agricultural commodities. A number of media articles were developed by the participants based on information obtained from various lecturers as well as from background documents. The participants felt that the benefits of food irradiation needed to be promoted through the media in the region. At their own initiative, they decided to establish an Irradiation Network for the Media (INFORM) and already published and distributed a number of positive articles about food irradiation through their local media.

FAO/IAEA/AFRA Workshop on the Industrial and Public Acceptance of Food Irradiation, Accra, Ghana, 11-15 September 2000

The Workshop on the Industrial and Public Acceptance of Food Irradiation was held in Accra, Ghana, 11-15 September 2000 in co-operation with the Government of Ghana through the Ghana Atomic Energy Commission (GAEC). The Workshop (under AFRA IV- 19/ RAF/8/024: Radiation Processing of Food and Industrial Products) was attended by national food irradiation project co-ordinators and food industry representatives from each AFRA member state which is party to the AFRA Agreement

The purpose of the Workshop was to seek industrial and public acceptance of food irradiation through information dissemination on safety and wholesomeness of irradiated food, and efficacy of the process to ensure food safety from contamination with pathogenic organisms, reduce post-harvest food losses, a viable alternative to methyl bromide (a widely used fumigant which is being phased out under the provisions of the Montreal Protocol) for quarantine and other insect disinfestation purposes.

AFRA/ARCAL/RCA Workshop on Development of an International Protocol on Irradiation as a Quarantine Treatment for Food and Agricultural Commodities, Tangiers, Morocco, 11-15 September 2000

This interregional Workshop was held in collaboration with the Government of Morocco through the Institut National de Recherches Agronomiques (INRA) in Tangiers, 11-15 September 2000. The Workshop was attended by 5 participants from each of AFRA, ARCAL and RCA regions who are experts on phytosanitary treatment of food and agricultural commodities or members of the food trade companies/associations. The Workshop developed Guidelines for the Use of Irradiation as a Phytosanitary Measure for Quarantine Pests for submission to the IPPC to initiate an international standard on this subject through its procedures. It also finalized a research guideline for establishing procedures for the application of ionising radiation as a commodity treatment for quarantine pests to assist national authorities and research scientists to develop data on irradiation as a quarantine treatment of a wide variety of insect pests.

Second FAO/IAEA Research Co-ordination Meeting on Determination of Profiles of Human Bacterial Pathogens in Food for Export by Introduction of Quality Assured Microbiological Assays, Bogor, Indonesia, 16-20 October 2000

This RCM was hosted by the Department of Food Technology and Human Nutrition, Faculty of Agricultural Engineering and Technology, Institut Pertanian Bogor, Bogor, Indonesia, 16-20 October 2000. It was attended by 10 participants who served as research contract and agreement holders, most of whom have good evidence identifying the source of particular problems and may be influential in addressing these problems.

Seafoods:

Evidence is mounting that in tropical areas, contaminated ocean and aquaculture pond water reflect adversely on the microbiological quality of seafoods harvested from that water. It seems possible that observed seasonal effects on quality are a reflection of the water quality. Post-harvest processing and handling conditions for seafoods have been confirmed as important factors influencing microbial quality.

Additional data from other harvesting locations and processing facilities are required to complement the existing results. The work plans proposed at the meeting will supply more data and it is recommended that these plans be implemented.

Results show that *Listeria monocytogenes* occurs intermittently on shrimp. Its significance is unknown as it is not reported to be transmitted by seafood. However, this may become an 'emotional response' organism and it is recommended that monitoring should continue. Knowledge of the incidence will be valuable should this organism become an issue later.

Meats:

Importing countries may require monitoring of exports for *E.coli* O157 although testing is expensive and surveys to date indicate a very low incidence in several meat producing countries. Projects to determine the incidence of *Salmonella* show a low incidence. Further monitoring will refine the data available.

Large baseline surveys conducted by the USA and Australia to establish the incidence of *Salmonella* and other bacteria in meat are beyond the capabilities of most of our laboratories but continued monitoring will improve the reliability of data for our respective countries.

Important components of the RCM included the peer reviews of research, and discussions of methodology, lab QC etc. with colleagues with similar interests and problems.

It is recommended that these professional contacts be maintained via all means of communication available.

Importing countries may soon be using PCR/molecular techniques of analysis for monitoring of foods. These techniques provide testing capabilities not currently available such as virus and pathogenesis factor detection.

Second FAO/IAEA Research Co-ordination Meeting on Evaluation of Methods of Analysis for Determining Mycotoxin Contamination of Food and Feed, Vienna, Austria, 4-8 December 2000

The second Research Coordination Meeting (RCM) of the FAO/IAEA Coordinated Research Project (CRP) on Evaluation of Methods of Analysis for Determining Mycotoxin Contamination of Food and Feed took place at IAEA, Vienna, Austria, from 4 to 8 December 2000. Twenty three participants, including research contract/agreement holders and observers from Argentina, Australia, Austria, Brazil, China, Cuba, Canada, Egypt, Ghana, Germany, Indonesia, Italy, Malaysia, Philippines, South Africa, United Kingdom, USA, and Uruguay attended the RCM. The objective of this RCM is to review the results of research activities achieved by the participants under the CRP, to prepare work plan outlines and a timeframe for the coming year, and to determine the forthcoming events including future research topics and the forecast of dates and place of the next RCM. A full report on this meeting will appear in the next edition of this Newsletter.

FAO/IAEA (RCA) Workshop on Certification of Irradiation as a Sanitary and Phytosanitary Treatment for Food and Agricultural Commodities, Sydney, Australia, 18-22 December 2000

This regional Workshop was held in co-operation with Australian National Office of Animal and Plant Health (NAOPH), National Office of Food Safety and Australian Quarantine Inspection Service, Sydney, Australia, 18-22 December 2000. The purpose of the Workshop was to inform senior food inspectors/control officials and senior plant quarantine officials of the systematic approach in certifying irradiation as a sanitary and phytosanitary treatment for food and agricultural commodities destined for international trade. Nineteen senior food control and plant quarantine officials from governments which are members of the RCA were selected to attend this Workshop. A full report on the workshop will be given in the next edition of the Newsletter.

D. STATUS OF EXISTING CO-ORDINATED RESEARCH PROJECTS (CRPs)

Classification of Soil Systems on the Basis of Transfer Factors (TF) of Radionuclides from Soil to Reference Plants

This CRP has been functional since December 1998. The first Research Co-ordination Meeting of the of the CRP held in Izmir, Turkey, 12-16 April 1999 agreed that a good QA/QC programme is essential to ensure that the quality of the data from each of the participants is sufficient for the needs of the CRP. It was agreed that, at a minimum, inter-calibration standard for Cs -137 and Sr-90 in both soil and vegetation should be sent to each participant for analysis, if possible, each year for the duration of the project. Additional split- sample analyses will be performed among participants on a voluntary and mutually agreed upon basis. These results will also be included in the CRP report. Accordingly, with assistance from the Agency's Seibersdorf Laboratories, two Inter-Calibration Reference Samples of Soil and Vegetation were sent to all 15 participating laboratories of the CRP. Results of the analysis were reported on a supplied reporting form by 31 July 2000. Necessary instructions were provided to the participants for analysis of alpha, beta and gamma emitting isotopes in the reference materials under the proficiency test programme to ensure quality of research data being generated by the laboratories. In addition, these procedures would enhance the received worth of the CRP to external reviewers.

Participants in the CRP have been supplied with the ISO 25 guide for compliance in carrying out investigations and must have an adequate statement of compliance in reporting their results. All participants will follow the FAO/IAEA/IUR Protocol developed for this purpose. The protocol provided a solid foundation from which to proceed.

The CRP is now in its second year of operation and progress to date has been good. The goals of the CRP are classification of soil ecosystems on the transfer of radionuclides from soil to crops. These objectives are based on the findings of a previous CRP that identified unusual soils with extreme TF values. These TF values were not crop specific but were isotope specific and controlled by the soil types. Participants will be providing information on the parameters that significantly influence soil-to-plant transfer of radionuclides.

Research data on TFs of Cs-134 and Cs-137, Sr-85 and Sr-90 along with other radionuclides based on selected soils in pot and field studies with broad-leafed crop plants, e.g. cabbage and wheat will be reported in the specifically developed data sheets. The findings of the CRP will be used as input to predict transfer of

radionuclides from any soils that may be contaminated. This will provide for more accurate dose assessment for populated regions as well as for critical groups living on 'atypical' soil types. The second RCM of the CRP scheduled to be held in Vienna, Austria, from 12-16 March 2001 will review all these results.

Determination of Profiles of Human Bacterial Pathogens in Food for Export by Introduction of Quality Assured Microbiological Assays

This CRP is in the third year of operation and is participated by 10 research contracts and 3 research agreement holders. The 2nd Research Co-ordination Meeting of this CRP was recently held in Bogor, Indonesia, 16-20 October 2000 (see Past Events).

Evaluation of Methods of Analysis for Determining Mycotoxin Contamination of Food and Feed

This CRP is in the third year of operation with 13 research contracts and 4 research agreements from 15 countries collaborating. Progress has been made in evaluating various methods for analysing mycotoxin contamination in food and feed, supplemented by proficiency tests co-ordinated by FAPAS, MAFF, UK on behalf of the FAO/IAEA Training and Reference Centre for Food and Pesticide Control. The participants presented their progress reports and discussed future plans at the 2nd RCM, Vienna, Austria, 4 - 8 December 2000.

Validation of Thin-Layer Chromatographic Screening Methods for Pesticide Residue Analysis (in Vegetables)

The CRP aims to validate thin-layer chromatography (TLC) methods that can be used to screen food and environmental samples for pesticide residues. Most participants have achieved acceptable reproducibility and have solved difficulties with gel permeation chromatographic (GPC) clean up. There have been several changes to the CRP. Mr. Ferris took over as Project Officer following the retirement of Mr. Hussain while the Hungarian Plant Protection Organization have recently appointed Dr. Mária Susán (qafuzesi@matavnet.hu) to replace Mr. Ambrus as an Agreement Holder. Dr. Susán brings to the CRP a wealth of practical experience on TLC. Mr. Ambrus has agreed to maintain links with Contract Holders by sharing information and experience gained from CRP "Validation of Alternative Methods to Gas and High Performance Liquid Chromatography for Pesticide residue Analysis in Grains". This will be handled through a combined message board for TLC contract holders and future joint activities. The second Research Co-ordination Meeting of this CRP was held in Vienna, 9-13 October 2000 (see Past Events)

Irradiation as a Phytosanitary Treatment of Food and Agricultural Commodities.

This CRP has 12 research contracts and 4 research agreements in disciplines related to use of irradiation as a quarantine treatment of fruits and vegetables against insect pests other than tephritid fruit flies, against insects and mites in cut-flowers and as an alternative to methyl bromide fumigation of stored food products. Progress of work carried out under this CRP was reported at the 2nd RCM held in Fresno, California, 13-17 November 2000 (See report of this RCM in the next issue).

Quality Control of Pesticide Products

This CRP was initiated just before the end of 2000. It is expected to include 10 research contracts from Cuba, Hungary, India, Nigeria, Panama, Philippines, Thailand, Uruguay and Viet Nam and one research agreement. The first RCM of this CRP is planned to be held in Velence, Hungary, 7-11 May 2001, to finalize the work plan to be carried out during the tenure of this CRP.

E. INTERNATIONAL CONSULTATIVE GROUP ON FOOD IRRADIATION (ICGFI)

Visit us at <http://www.iaea.org/icgfi/>



Excerpts of 17th Annual Meeting of ICGFI

The 17th Annual Meeting of ICGFI was held at WHO Headquarters, Geneva, Switzerland, 1-3 November 2000. It was attended by 36 designated experts from 23 ICGFI member governments, 4 representatives of inter-governmental organizations and 5 representatives of non-governmental organizations. The highlights of the Meeting included considerations on:

1. Future Role of ICGFI beyond 2002

There was unanimous support from the designated experts of member governments present at the Meeting for the extension of the ICGFI mandate beyond 2002 under the UN Agencies, however, there were differences of views among countries about accepting financial contributions from the private industry and what role ICGFI should play in future. Whereas developed countries viewed that ICGFI should play an increasing role in promoting food irradiation as a public health intervention measure, most developing countries expressed the view that food security and trade should be the focus of future ICGFI activities as these are the major challenges for developing countries and food irradiation can contribute to addressing these issues. In view of the diverging views expressed on the floor of the Meeting and the inability to arrive at a consensus view of the future role of ICGFI, a Working Party was formed to come out with clear proposals and a revised Draft Declaration on its future role and function.

The Working Party Report proposed mandatory financial contribution of minimum US\$ 5,000 from governments, renewed focus on future activities, and revised Declaration for the future role of ICGFI. After an extensive discussion, the Meeting unanimously adopted the extension of the ICGFI mandate for another 3 or 5 years as proposed in the Working Party Report and mandatory contribution of cash or in-kind towards ICGFI activities. It was decided that member governments will be requested to ratify in writing the new Declaration and also their views in regarding mandatory contributions in cash or in-kind, amount of contribution, and other administrative matters of the revised Declaration.

2. 2001 Programme of Work and Budget

The Meeting approved the following major activities for 2001:

- 1) EU Workshop on Food Safety/Trade in Irradiated Food;
- 2) Workshop on Food Irradiation for Codex delegates attending the next Codex Committee on Food Additives and Contaminants (CCFAC), Geneva, in July 2001;
- 3) Workshop on Certification of Irradiated Food in Latin America, at a suitable location in a member country in the region;
- 4) Global Marketing Study on Irradiated Food to be undertaken by FAO, Rome;
- 5) Establishing an Irradiation Promotion Council E-Commerce to facilitate Trade in Irradiated Food, to be implemented by a suitable organization in a member country;
- 6) ICGFI-IUFoST Symposium on Food Irradiation, Seoul, April 2001
- 7) Publication of a brochure on “High-Dose Irradiation of Food”.

Food Irradiation Workshop, Beijing, China, 19 March 2000

A Workshop on Food Irradiation was organized by the ICGFI in Beijing in conjunction with the 32nd Session of the Codex Committee on Food Additives and Contaminants (CCFAC) at Beijing, 20-24 March 2000. The objective of this half day workshop was to brief the delegates to the CCFAC on developments of food irradiation in general and the need to consider the revision of the Codex General Standards for Irradiated Foods. The Workshop was held on Sunday, 19 March from 1330 to 1700 hr at Kerry Centre Hotel, Beijing. It was attended by 44 delegates from 15 countries which included Brazil, China PR, Denmark, France, Germany, Israel, The Netherlands, Philippines, South Africa, Sweden, Switzerland, Thailand, UK and USA. In addition one delegate from EU also participated.

The topics discussed included 1. Radiation preservation of food: Basic principles and practical implications (Irwin Taub, USA), 2. Wholesomeness: Assessment of safety and nutritional adequacy of irradiated food (Gerry Moy, WHO), 3. Practical applications and worldwide adoption of the technology (Paul Thomas, ICGFI), and 4. Proposed revision of Codex General Standard for Irradiated Food (Irwin Taub, USA).

The workshop evinced great interest and there were interactive discussions. Participants had the opportunity to taste radiation-sterilized foods developed by Natick Labs, USA for the Appollo Space flights and those from South Africa.

32nd Session of the Codex Committee on Food Additives and Contaminants (CCFAC)

The “Proposed Draft Revised General Standard for Irradiated Foods”, as submitted by the ICGFI, was discussed by the CCFAC at Step 3 under the Codex procedures under Agenda Item 10. The representative of ICGFI (P. Thomas) drew attention to recommendations made by the Joint FAO/IAEA/WHO Study Group on High Dose Irradiation that no upper limit on dose be imposed, since any food irradiated to a dose appropriate to achieve the technological objective would be safe to consume and nutritionally adequate. He briefed the CCFAC about the rationale behind the proposed draft revision. The current radiation dose limit in the Codex General Standard for Irradiated Foods (CODEX STAN 106-1983) of 10 kGy was based on the 1981 FAO/IAEA/WHO JECFI Report on the Safety and Nutritional Adequacy of Food Irradiated with doses up to 10 kGy. The practical applications at doses below 10 kGy include sprout inhibition of tuber, bulb and root crops; control of ripening and maturation of fruits and vegetables; insect disinfestation of grains and other dried foods; and sanitary and phytosanitary treatment of foods of both plant and animal origin for the elimination of food borne parasites and pathogens, and insect pests of quarantine significance in agricultural and horticultural products. Doses above 10

kGy could be applied to several types of food to improve their hygienic quality, to make them shelf stable by eliminating spores of proteolytic strains of *Clostridium botulinum* and all spoilage causing organisms. These include spices and other dry food ingredients, prepackaged precooked foods that could be held indefinitely without refrigeration, and sterilized meals for specific target groups such as disaster victims, outdoor enthusiasts and the immunocompromised.

The “Proposed Draft Revised General Standard for Irradiated Foods” at Step 3 under section 2.2 would replace the existing sentence “The overall dose absorbed by a food subjected to radiation processing should not exceed 10 kGy” with the new sentence “For the irradiation of any food, the minimum absorbed dose should be sufficient to achieve the technological purpose and the maximum absorbed dose should be less than that which would adversely affect functional properties or compromise sensory qualities”. The amended wording would entail consequential changes in the footnote.

The comments either submitted in writing or presented orally at this meeting in general supported the need to revise the General Standard. The representative of the EU did not support a change to the current maximum dose. Some countries (Canada, Philippines, Norway, Turkey) recommended minor modifications to the proposed revision whereas South Africa and USA supported the Draft Revised Standard. One recommendation made by the European Union, and supported by Consumers International, would involve replacing the current paragraph 3.1 on hygiene with a more explicit statement on good hygienic practices with strong emphasis on HACCP principles. Two delegations noted that the companion Recommended International Code of Practice for the Operation of Irradiation Facilities used for the Treatment of Foods (CAC/RCP 19-1979) should also be amended.

The CCFAC decided to ask WHO, in coordination with IAEA and FAO, to revise the Codex General Standard for Irradiated Foods for circulation, comment at step 3 and further consideration by the 33rd CCFAC. As requested by the representative of IAEA, the Committee also agreed to request the Executive Committee to consider as new work the proposed draft revision of the companion Recommended International Code of Practice for the Operation of Irradiation Facilities Used for the Treatment of Foods (CAC/RCP-19-1979) for consistency with the ongoing revision of the General Standard and incorporate HACCP principles.

Workshop on Trade Opportunities for Irradiated Food, Kona, Hawaii, USA, 22-24 May 2000.

Recognizing that irradiated foods are gaining acceptance and are being processed in large quantities in several countries, the ICGFI decided at the 16th Meeting to convene a Workshop on this subject to expedite international trade in irradiated food. The Workshop was held in Kona, Hawaii in conjunction with an APEC Workshop on Alternative Quarantine Treatments and Post-harvest Handling Methods, also held at the same venue, 17-19 May 2000, where irradiation as a phytosanitary treatment featured prominently. It was held at the wake of the completion of an installation of a commercial X-ray irradiation facility, Hilo, Hawaii, designed for treating food and horticultural commodities to meet quarantine requirements in the US mainland and elsewhere. The ICGFI Workshop was attended by over 50 participants, many of whom were from the food industry and trade, from 12 countries which have active production of irradiated food.

The Workshop adopted an Action Plan to accelerate trade in irradiated food, especially on spices and vegetable seasonings, dried fruits, nuts and condiments, fresh fruits (both tropical and temperate), and poultry meat. This Action Plan includes initiating trade in irradiated food through trade shows, trade missions, trade through the internet, establishing irradiation promotion council and other plans to overcome trade barriers in irradiated food, both treated for sanitary and phytosanitary purposes. The representative of the USDA/APHIS announced that its Proposed Rule on Irradiation Phytosanitary Treatment for Imported Fruits and Vegetables would soon be published in the Federal Register (it was published on 26 May 2000). Following 60 day comment period and finalization of this Rule, the US market would be prepared to accept irradiated fruits and vegetables which are properly treated against major species of fruit flies and mango seed weevil.

The report of the Workshop is available on request.

Food irradiation Process Control School (FIPCOS), Iowa State University, 24 July - 4 August 2000.

The Codex General Standard for Irradiated Foods (CAC/CODEX STAN 106-1983) stipulates that the food irradiation facilities shall be staffed by adequate, trained and competent personnel. In view of these considerations, the ICGFI in cooperation with the Iowa State University, Ames, Iowa is organizing Food Irradiation Process Control School (FIPCOS) for Food Inspectors/Control Officials and Operators of Irradiation Facilities Available for Processing Food at Iowa State University, Ames, Iowa, USA from 24 July to 4 August 2000. The training is expected to facilitate acceptance of irradiated food in international trade.

A curriculum for FIPCOS was developed and endorsed by a number of national food control authorities. FIPCOS would train food inspectors/control officials, operators, supervisors, and/or plant managers of irradiation facilities which process food on a commercial scale on proper food irradiation process control with special emphasis on Good Manufacturing Practice (GMP) and HACCP principles, dosimetry techniques, record keeping, safety precautions etc. This is the first time a combined FIPCOS for food inspectors/control officials and plant operators/managers is being conducted. It is expected that interactive discussions within these two groups of participants and course lecturers would evolve a complementary role for operators of the facility and inspection personnel in ensuring proper process control in radiation processing of foods. A total of 15 participants who are operators of irradiation facilities and food inspectors have been selected for this FIPCOS.

Databases

The ICGFI maintains a database on Clearances of Irradiated Foods in various countries and a database on International Inventory of Authorised Food Irradiation Facilities operating worldwide. The database on Clearances of Irradiated Foods has been updated as of May 2000. Currently, 42 Countries have regulations permitting one or more irradiated food items, Turkey being the most recent. In order to update the database on Authorized Radiation Facilities, questionnaires have been sent out to all ICGFI National Contact Points for providing latest information on new irradiation facilities that have been approved by national regulatory agencies for the treatment of foods or are under construction. The ICGFI databases are online and can be accessed at the Web Page (<http://www.iaea.org/icgfi/>).

F. RECENT DEVELOPMENTS ON COMMERCIAL APPLICATION OF FOOD IRRADIATION IN THE USA

There was a rapid development on commercial application of food irradiation in the USA in the past year following the approval of the USDA for quality control of irradiated meat (to eliminate pathogenic bacteria) in February 2000. Starting mid-May 2000, irradiated ground beef was put on sale in 84 supermarkets in Minneapolis/St. Paul area, Minnesota. Within one day, the number of supermarket stores which offer irradiated meat grew to over 100 and continued to grow to over 150 stores in other cities in Minnesota within one week. At the end of this year, some 1,000 supermarkets in many States in the USA offer irradiated meat for sale. Approximately 200 metric tonnes/week of ground beef have been irradiated so far using two electron machines located at Sioux City, Iowa. Irradiated meat was labelled "electron irradiated". According to the sale manager of a chain supermarket involved "Consumer demand and response has been tremendous. Our customers have expressed great satisfaction with our (irradiated) products". Many of these stores have re-ordered irradiated meat to be sold. One company which offers home delivery of food nation-wide, has already started marketing irradiated meat in the USA.

Starting July this year, commercial quantities of fresh ground beef have been irradiated at a commercial food irradiator near by Tampa, Florida, using gamma rays, for marketing mainly in Florida and some States in the east of the USA under the trade name "New Generation" ground beef.

The first commercial X-ray irradiator for food irradiation located in Hilo, Hawaii started operating at the end of July this year. So far, some 300 tonnes of fruits from Hawaii, mainly papaya, have been irradiated at this facility for marketing in the US mainland. Several new commercial irradiators dedicated to food irradiation are under construction in the USA (Arkansas, New Jersey, New York) in response to the apparent demand by the food industry, and several more are being planned. There are already several existing commercial irradiators available for treating food in the USA.

The USDA/Animal Plant Health Inspection Service has issued a Proposed Rule on Irradiation Phytosanitary Treatment for Imported Fruits and Vegetables, on 26 May 2000. Such a regulation once finalized will open the US market to irradiated fruits and vegetables, treated to meet quarantine requirements, from other countries.

In other countries, within the past two years new commercial irradiators available for food irradiation including some which are dedicated to food irradiation have been commission in Brazil (which plans to add up to 10 facilities in the next 5 years), China, India, Republic of Korea, Mexico, and Thailand (3 irradiators). Others including Austria, China, the Philippines, and Turkey plan to use existing facilities or to start building new irradiators for treating food on a commercial scale in the near future.

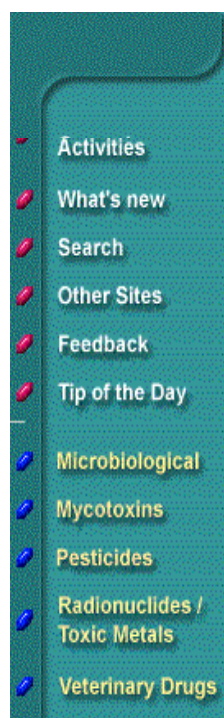
The future of food irradiation is quite promising. As the international organization which supports the work on food irradiation from the very beginning, the Agency should be proud of this achievement which clearly demonstrates the benefit of nuclear technology to mankind.

USDA/APHIS' Proposed Rule on Irradiation Phytosanitary Treatment of Imported Fruits and Vegetables, 7 CFR Parts 305 and 319 (Docket No. 98-030-1), 26 May 2000

The USDA/APHIS has published this Proposed Rule to establish regulations providing for use of irradiation as a phytosanitary treatment for fruits and vegetables imported into the Untied States. The irradiation treatment would provide protection against fruit flies and mango seed weevil. The proposal would provide an alternative to the currently approved treatments (various fumigation, cold, and heat treatments, and system approaches employing techniques such as greenhouse growing)) against fruit flies and the mango seed weevil in fruits and vegetables. For details of this Proposed Rule, please visit: www.aphis.usda.gov/ppd/rad/webrepor.html

G. The FAO/IAEA Training and Reference Centre for Food and Pesticide Control (TRC)

Visit the TRC at <http://www.iaea.org/trc/>



Welcome to the



Provides training and assists the Member States to reach international standards on analytical methods for food contaminants

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In April 2000 the TRC website received over 6000 HTTP requests. Many visitors were attracted by the method validation webpages (http://www.iaea.org/trc/pest-qa_val.htm) with most requests for “Statistical methods applicable to validation of analytical methods” (http://www.iaea.org/trc/pest-qa_val_annex4.pdf). Useful tips and suggestions were added to the TRC FeedBack and on-line message board (<http://www.iaea.org/trc/feedback/feedback.htm>). Become a regular reader. Better still, share your analytical experience with colleagues or contribute a question to the message board. Our goal is to establish a global network addressing issues related to microbiological, mycotoxin, toxic metal, radionuclide, pesticide and veterinary drug residue analyses.

1. Second Training Workshop on Introduction to Quality Assurance / Quality Control Measures in Pesticide Residue Analytical Laboratories

The Workshop was organised in Vienna/Seibersdorf in the laboratories of the Agrochemicals Unit of the FAO/IAEA Agriculture and Biotechnology Laboratory between 3 July and 14 August 2000. It was attended by 20 participants from Albania, Barbados, Burkina Faso, China, Columbia, Costa Rica, Indonesia, Kenya, Lebanon, Nigeria, Philippines, Romania, Seychelles, South Africa, Sudan, Syria, Tanzania, Uzbekistan and Vietnam. The participants were selected from over 50 nominations. Since the funds available were limited, priority was given to those whose participation was fully or partly supported by their governments.

The Workshop provided an introduction to and detailed explanation of QA/QC principles and the advances in analytical techniques relevant to pesticide residue analysis. Practical examples were used to demonstrate the application of the general principles outlined in ISO Guide 25 and GLP Guidelines. Training certificates were given to those participants who successfully completed the training programme.

2. Regional Training Workshop on Development of Quality Assurance for Mycotoxin Analysis of Food and Feed for Eastern European Countries

The Training Workshop was organized by Food and Agriculture Organization (FAO) of the United Nations and International Atomic Energy Agency (IAEA) through their Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, at International Atomic Energy Agency (IAEA), Vienna, Austria, from 29 August to 10 September 2000.

The Training Workshop consisted of theoretical lectures, practical group exercises, case studies and quality assurance in mycotoxin analysis i) to provide participants with general quality assurance principles and give theoretical and practical training in the implementation of Guide ISO 25 and GLP, and ii) to enable mycotoxin control laboratories in compliance with the requirements in international trade by establishing a quality system and obtain reliable analytical results necessary for accreditation. The subjects covered during the workshop included: General principles of quality assurance; ISO Guide 25; Good Laboratory Practices (GLPs); Document and manual preparation; Personnel qualification; Method validation: statistical tools and techniques; Proficiency studies; Traceability of standards and results; Reference materials; Equipment calibration, and Accreditation procedure by certified bodies.

Participants including scientists with ample experience in mycotoxin analyses, head analysts and/or quality assurance officers working in official laboratories responsible for control of import and export food, from Albania, Belarus, Bulgaria, Croatia, Cyprus, Hungary, Poland, Romania, Slovak Republic, and Turkey, attended the workshop. The participants were provided with handouts, documents, guidelines, and exercise materials. Oral presentation were given, practical audits conducted and a final examination passed by the participants. Certificates were delivered by the organizers.

3. International Food Contaminant and Residue Information System (INFOCRIS) (<http://www-infocris.iaea.org/>)

Food Contaminant and Residue Information System

English Español



<http://www-INFOCRIS.iaea.org/>

The International Food Contaminant and Residue Information System is the Agency's first information system that uses the Internet to collect information and CD-ROMs to redistribute the information to analysts without ready access to the Internet.

The first phase in the development of INFOCRIS has been completed successfully, namely: proof of concept,

prototyping and a six trial on the Agency's NT test platform. The second phase now focuses on training and building up the information content for selected contaminants and residues. Training is primarily addressed through "PathFinder" which is activated by the help button on the left hand navigation bar. PathFinder addresses the needs of general users, specialists and editors. Proficiency is achieved quickly without prior knowledge of INFOCRIS architecture or procedures. While no INFOCRIS manual exists, training material for editors may be uploaded from the Internet (<ftp://ftp.iaea.org/dist/rifa-trc/infocris-editor-man1.pdf>). Training is now being provided in conjunction with the Sub-Programme's ongoing activities. The first training workshop was held in Hungary on 23 February 2000 followed by further training in July and August 2000 and thereafter on an ad hoc basis. If you have information for a particular analyte and would like to join INFOCRIS editors, please contact Paisan Loaharanu (P.Loaharanu@iaea.org) or Ian Ferris (I.G.Ferris@iaea.org).

4. Laboratory Research

Laboratory research work concentrated on the development of the methodology for the estimation and quantification of uncertainty of analytical results, which are critical elements of method validation. The effects of sample processing, presence of matrix in purified extracts and stability of residues on the uncertainty of the results were studied within the programme. The results of the first phase of the studies were presented at the International Workshop on Method Validation (see under publications) held in Budapest in November 1999. The work will be continued in 2001.

5. Training Workshops Planned for 2001

Second Training Workshop on Introduction to Quality Assurance / Quality Control Measures in Analysis of Commercial Pesticide Products, Hungary, April 2001

Third Training Workshop on Introduction to Quality Assurance / Quality Control Measures in Pesticide Residue Analytical Laboratories, Vienna, Austria, July-August 2001

Information on the workshops

The minimum qualification and preconditions for accepting nominations for the training can be found on the TRC Home Page (<http://www.iaea.org/trc>) under Pesticides/Training or can be obtained from Mr. Arpad Ambrus.

Advance nominations may be submitted by the Heads of nominating institutions through the FAO Representative, FAO National Committee or National Atomic Energy Authority.

Nominations together with the completed questionnaire and Language Proficiency Certificate, issued by a language school, cultural institution or the British Embassy, should be sent to:

Mr. Arpad Ambrus
Head Agrochemicals Unit
FAO/IAEA Agriculture and Biotechnology Laboratory
A-2444 Seibersdorf, Austria
Fax: +43-1-260028222, E-mail: A.Ambrus@iaea.org

H. PUBLICATIONS

Ambrus A.: Practical procedures to validate method performance and results of analysis of pesticide and veterinary drug residues, and trace organic contaminants in food. International Workshop on Principles and Practices of Method Validation, Budapest, Hungary, 4-6 November 1999.

Ambrus A: Worked example for the validation of a multi-residue method, Plenary lecture.

A. Ghods, B. Maestroni, M. El Bidaoui, N. Rathor, T. Tam and A. Ambrus: Testing the Efficiency and Uncertainty of Sample Preparation using ¹⁴C-labelled chlorpyrifos, Poster presentation. International Workshop on Principles and Practices of Method Validation, Budapest, Hungary, 4-6 November 1999

B. Maestroni, M.El-Bidaoui, A. Ghods, O.Jarju, J. Pakayew and A. Ambrus Testing the efficiency and uncertainty of sample preparation using ¹⁴C-labelled chlorpyrifos: PART II, Poster presentation.

International Workshop on Principles and Practices of Method Validation, Budapest, Hungary, 4-6 November 1999.

E. Soboleva, N. Rathor and A. Ambrus: Estimation of significance of “matrix-induced” chromatographic effects, Poster presentation.

Ambrus A: Risk assessment for pesticide residues in foodstuffs. Seminar on ‘Food safety and nutrition policy: developments in safety assessment and nutrition science’, Ankara, Turkey, 22-23 November 1999.

Loaharanu, P.: Trends on the use of irradiation as a sanitary and phytosanitary treatment for food. Food Irradiation 2000: *Bring a New Food Safety Process to Market*, Washington, D.C., 3-5 April 2000.

Loaharanu, P.: Global trends on the use of irradiation as a phytosanitary treatment for food, Invited paper. APEC Workshop on Alternative Quarantine Treatments and Post-Harvest Handling Methods, Kona, Hawaii, USA, 17-19 May 2000

Loaharanu, P.: Trends on the acceptance and application of irradiation as a sanitary and phytosanitary treatment for food and horticultural commodities, Invited paper. ICGFI Workshop on Trade Opportunities for Irradiated Foods, Kona, Hawaii, USA, 22-24 May 2000

E. Soboleva, N. Rathor, A. Mageto, and A. Ambrus: How to control “matrix-induced” chromatographic effects in trace analysis of pesticides, Poster presentation. 23rd International Symposium on Capillary Chromatography, Riva del Grada, Italy, 5-10 June 2000

Matin, M.A. The role of food irradiation for food safety and security, Oral presentation. International Conference and Workshop on Food Security of Urban and Peri-urban Systems in Developing Countries, Vienna, Austria, 15-18 November 2000

Irradiation of fish, shellfish and frog legs – A compilation of technical data for authorization and control, ICGFI, IAEA-TECDOC-1158.

Standardized methods to verify absorbed dose in irradiated food for insect control, Report of the final Research Co-ordination Meeting of the FAO/IAEA/PAHO CRP on Irradiation as a Public Health Intervention Measure to Control Foodborne Diseases (*Cysticercosis/Taeniasis* and *Vibrio* Infections) in Latin America and the Caribbean, Havana, Cuba, 16-20 November 1998, . IAEA-TECDOC (in press).