FOOD AND ENVIRONMENTAL PROTECTION NEWSLETTER

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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IAEA Web Page: http://www.iaea.or.at/worldatom/
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TO THE READER

Dear Colleagues,

This issue contains a number of exciting news items about recent Research Co-ordination Meetings held during 1998 as well as events planned for next year. Among the latter is an FAO/IAEA/WHO International Conference on Ensuring the Safety and Quality of Food through Radiation Processing to be held in October 1999.

The reader will be interested to know that the 15th Annual Meeting of the International Consultative Group on Food Irradiation (ICGFI), held in Vienna, 20-22 October 1998 decided to extend its mandate for another three years, i.e. until May 2002. The Programme of Work and Budget of ICGFI for 1999 as approved by the 15th Meeting is also included in this issue. The ICGFI Home Page (**http://www.iaea.org/icgfi)** which was put on line in July 1998 has attracted wide interest. Within one month after going on line, it received more than 20,000 hits on the Internet.

Similarly, positive developments occurred within the FAO/IAEA Training and Reference Centre for Food and Pesticide Control (TRC), and they are reported in this issue. The highlight is the TRC Home Page (**http://www.iaea.org/trc)** which went on line at the beginning of December 1998. This Home Page is also expected to attract wide public interest.

Readers are encouraged to visit our Home Pages regularly and contact us through the **Feedback** button on the Home Pages. Any suggestion to improve our Home Pages or information dissemination would be welcome. Remember, we need your inputs on our activities to meet the need of governments, scientists and end users of our technology and information.

The staff of Food and Environmental Protection Sub-Programme wish our readers a Merry Christmas and a successful 1999.

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Head, Food and Environmental Protection Section

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B. FORTHCOMING EVENTS

First Research Co-ordination Meeting in the CRP on Irradiation as a Phytosanitary Treatment of Food and Agricultural Commodities, 29 March - 2 April 1999.

The first FAO/IAEA Co-ordination Meeting on this subject is tentatively planned for Bangkok, Thailand, 29 March - 2 April 1999. It is expected to be attended by 12 participants from Australia, Chile, China, India, Iran, Japan, Malaysia, Poland, Syria Thailand and USA. The objective of this RCM is to develop plan of work to be carried out by the participants during the next 5 years based on an "international research protocol" to demonstrate the efficacy of irradiation as a phytosanitary treatment of fresh horticultural commodities and stored products. Special emphasis will be given to research on selected pest/commodity combinations which represent major trade problems and have a realistic opportunity to implement the use of this technology in the near term.

First Research Co-ordination Meeting in the CRP on the Classification of Soil Systems on the Basis of Transfer Factors of Radionuclides from Soil to Reference Plants, 12 - 16 April, 1999

This FAO/IAEA/IUR sponsored CRP has 10 research contracts and 3 research agreements. The first RCM is planned for12-16 April, 1999. Tentatively, the venue of the meeting is Izmir, Turkey. The RCM will discuss the work plan for the first year keeping in mind the objectives of the CRP. The protocol developed earlier will be discussed and refined. The agreed Research Protocol and ISO Guide 25 will form the analytical working standards for the generation of data and important items for discussion, especially compliance issues. Another topic for discussion is the layout of data sheets which were circulated previously. An earlier CRP concluded that higher or lower uptake of radionuclides is not crop specific. If an agro-ecosystem shows a relatively high or low uptake for one crop, all crops will show this behaviour. The present project, therefore, aims to identify agro-ecosystems for which the soil-to-plant transfer of radionuclides 'deviates' from the average or normal pattern and to relate radionuclide uptake behaviour to climate and soil properties to improve the specificity of radiological assessment models.

First Research Co-ordination Meeting in the CRP on Evaluation of Methods of Analysis for Determining Mycotoxin Contamination of Food and Feed, 26 - 30 April 1999.

The first FAO/IAEA Research Co-ordination Meeting on this subject is tentatively planned for Kuala Lumpur, Malaysia, 26-30 April 1999. It is expected to be attended by some 18 participants from Argentina, Australia, Brazil, Canada, China, Cuba, Egypt, France, Indonesia, Italy, the Philippines, South Africa, UK, Uruguay and USA. The objective of the RCM is to review the programme of work to be carried out by the participants under the scope of the CRP according to the following:

- identify high risk mycotoxin/commodity combination that present impediments to trade through regulations and/or are non-tariff barriers to trade;
- evaluate analytical methods used by food control laboratories in developing and advanced countries for detection and quantification of these mycotoxins;
- select time and cost-efficient validated methods best suited for analysing the high risk mycotoxin/commodity chosen.

Third and Final Research Co-ordination Meeting in the CRP on the Impact of Long Term Pesticide Usage on Soil Properties Using Radiotracer Techniques, 24 - 28 May 1999.

The third and final Research Coordination Meeting of this CRP is scheduled to be held during 24-28 May 1999 in Hangzhou, Zhejiang, Peoples' Republic of China. Participants from Brazil, China (PR), Egypt, Germany, India, Pakistan, Thailand and USA are expected to attend the RCM. The objective of the CRP is to study the impact on soil properties and soil micro-organisms from intensive and repeated use of pesticides applied to crops such as cotton. The first RCM was held in Neuherberg, Germany and the second in Bangkok, Thailand. The data obtained so far indicate that repeated intensive applications of pesticides do not result in long lasting adverse effects on the soil properties and soil micro-organisms. The populations of soil micro-organisms are reduced immediately following the applications of several pesticides, but they recover in a few days. More conclusive data are expected to be presented by the project participants at the final RCM. It is expected that the information produced in the CRP will assist in designing environmentally rational pest control strategies.

FAO/IAEA (RCA) Regional Workshop on "Development of a Harmonised Protocol on Irradiation as a Quarantine Treatment of Fresh Horticultural Commodities", Manila, Philippines 7-9 April 1999.

The proposed Workshop would accommodate up to 2 participants from each RCA countries. The Workshop would develop a harmonised protocol for use of irradiation as a quarantine treatment of fresh fruits and vegetables in the RCA countries

Training Course on Development of Quality Assurance for Mycotoxin Analysis of Food and Feed, Manila, Philippines, 12-23 April, 1999.

Two participants from each RCA member states may participate in the course. The course is designed to train participants on ISO Guide 25 and GLP for reliable analysis of mycotoxins.

C. PAST EVENTS

Final FAO/IAEA Research Co-ordination Meeting in the CRP on Standardized Methods to Verify Absorbed Dose in Irradiated Fresh and Dried Fruits, Tree Nuts in Trade, Cascais, Portugal, 30 March - 3 April 1998

This meeting was hosted by the Nuclear and Technological Institute (ITN) and was held at Hotel Baia, Cascais, Portugal. It was attended by 11 participants who have collaborated in the work of this research programme during the past four years. The RCM was chaired by Prof. D. Ehlermann (Germany) and assisted by Drs. D. Razem (Croatia) and A. Kovacs (Hungary) in group discussions.

The participants reported on results obtained from evaluating various methods to verify minimum or maximum absorbed doses of irradiated fresh and dried fruits, and tree nuts. Such a verification is of particular relevance to these commodities which are irradiated for insect disinfestation in compliance with national regulations as the dose required for this purpose does not always result in immediate mortality. To avoid automatic rejection of irradiated consignments which may contain live (but sterile) insects, an objective method is desirable to assist food/quarantine inspectors to ensure that the minimum dose required by law has been given to the product. The report included validations of the application of label dose indicators to verify the absorbed dose in a batch or a consignment of food, evaluation of label dose-indicators and dosimetry systems in such a consignment, and development of hand-held readers of absorbed dose from the label.

Final Research Co-ordination Meeting in the CRP on the Use of Nuclear and Related Techniques in Studies of Agroecological Effects Resulting From the Use of Pesticides In Celtral America, Panama City, Panama, 20 - 24 April 1998.

This CRP was funded by SIDA and initiated in 1994. The objectives of the CRP were to (1) monitor pesticide residues in water and soil, (2) study persistence, degradation and uptake of pesticides by plants in model ecosystems and (3) evaluate the effect of pesticides on insect pests and their natural enemies commonly found in Central American region. The first RCM was held in Costa Rica, the second in Pendleton, SC, USA, and the third RCM was held in Guatemala. The final RCM was attended by twelve project participants from Costa Rica, Guatemala, Honduras, Nicaragua and Panama. Reports presented at the RCMs indicated wide spread contamination of water and sediment samples taken from rivers, lakes, lagoons and discharge from plantations. Water samples from rivers also contained residues of pesticides, some known to be highly toxic to fish. A major impact of the CRP has been the contribution to the effort of the Central American Governments to strengthen environmental legislation. For example, the results of this research have contributed data to the government's process for legislative control and registration of pesticides in Guatemala. The CRP also provided information useful in designing better IPM (integrated pest control) strategies in the region. Another major contribution of this programme was the introduction of analytical quality assurance and control (QA/QC) procedures in participating laboratories.

Final Research Coordination Meeting in the CRP on the Use of Nuclear and Immunochemical Methods for Pesticide Analysis, Quito, Ecuador, 14 - 18 September, 1998

The third and final RCM was attended by scientists from Australia, Bangladesh, P.R. China, Ecuador, Germany, Ghana, India, Lebanon, Pakistan, Philippines, Syria, Turkey, United Kingdom and the USA. Participants' findings were discussed with emphasis on an EnviroLogix Inc. DDT-DDE ELISA inter-laboratory comparison. Contract and Agreement holders worked together to produce a draft paper and an agreed workplan to finalise the CRP. The RCM culminated in a one day laboratory on ELISA, quality control and use of the Internet. Participants found the CRP mechanism valuable for validation of analytical methods and agreed unanimously to setup an informal ELISA network. Currently, a consultant, Dr. A. Dankwardt (Sension GmbH) is reviewing the results of the entire CRP and preparing recommendations on the role of immunochemistry for the FAO/IAEA Training and Reference Centre for Food and Pesticide Control. For more information click on **http://www.iaea.org/trc/pest-2027_welcome.htm**

Final Research Co-ordination Meeting in the CRP on Public Acceptance and Market Development of Irradiated Food in Asia and the Pacific, Bangkok, Thailand, 21 - 25 September, 1998

This meeting was held at the Office of Atomic Energy for Peace (OAEP), Bangkok, Thailand. The RCM was jointly hosted by the OAEP and FAO Regional Office, Bangkok and opened by Dr. Kriengsak Bhadrakom, Secretary General, OAEP. Mr A. Hicks, Senior Regional Officer for Agricultural Engineering and Agro-Industries, FAO Regional Office also addressed the opening session of the meeting. He welcomed the participants on behalf of the Directors General of the sponsoring organisations of FAO and IAEA. Research work carried out and progress made in the participating countries were presented by all 10 institutions from Bangladesh, People's Republic of China (2 research agreements one each from Shanghai and Beijing), Republic of Korea, Malaysia, Pakistan, the Philippines, Sri Lanka, Thailand and Vietnam. The CRP made substantial progress in the areas of commercialisation, public acceptance and trade development of irradiated food in the RCA countries. The achievements in the above target areas of the project were evaluated by 3 working groups and summarised information have been added to the Report of the Meeting. It was noted that more than 178,000 metric tons of different food products were irradiated and marketed during the project period through the normal trading channels in these countries. Consumer acceptance and food industry attitude towards irradiated foods was surveyed in most of these countries with very encouraging results. All the countries have food irradiation regulation/ standards in place and there have been positive steps to harmonise food irradiation regulations to introduce irradiated food in regional and international trade. Recently, Singapore has liberalised its standards on food irradiation and accepts any irradiated food commodities for trade on exactly the same basis as other non-irradiated food items. A number of Commercial/ Demonstration Irradiation Facilities are in operation in these countries. The participants indicated their interest to collaborate in seeking enhanced commercial activities and realising trade opportunities of irradiated food products. It was agreed that irradiation as a 'Sanitary and Phytosanitary Treatment of Foods' should be implemented in the RCA countries with priority given to fresh horticultural produce.

FAO/IAEA Regional Training Course for Latin America on Nuclear and Related Techniques for the Analysis of Pesticides in Water and Aquatic Organisms, Sao Paulo, Brazil, 7 September - 9 October 1998

The training course was held at the Instituto Biologico and was attended by trainees from Argentina, Brazil (2), Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Nicaragua, Uruguay and Venezuela. In laboratory exercises a US FDA method for the analysis of organochlorine pesticides in non-fatty fish and US EPA methods 3535 and 8081A for the analysis of organochlorine pesticides in water were validated by the course participants. In addition to method validation exercises, the course provided hands-on training to the participants in good laboratory practice (GLP) procedures, pesticide extraction, clean up and analytical techniques. The trainees received intensive training in analysis by gas chromatography (GC). Other techniques included solid phase and microwave extraction, use of radioisotopes and high performance liquid chromatography.

Second Research Co-ordination Meeting in the CRP on Validation of Thin Layer Chromatographic Screening Methods for Pesticide Residue Analysis (in Vegetables), Vienna, Austria, 16 - 20 November 1998

Participants from Argentina, Brazil, Belarus, Ghana, Kenya, Lithuania, Myanmar, Nigeria, Romania, Sweden and Thailand attended the RCM. The objective of the CRP is to validate TLC screening methods for analysis of pesticide residues in vegetable and fruit samples. The CRP was initiated in December 1996 and the first RCM was held in Miskolc, Hungary during February 1997. Since then the programme participants have been validating the methods. The participants presented their results and discussed some problems which they encountered during method validation exercises. Participation in the CRP is expected to strengthen pesticide residue analytical capabilities of the participants and provide training in validation of methods based on simpler and more cost effective screening analytical techniques.

Final Research Co-ordination Meeting in the FAO/IAEA/PAHO (WHO) 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, Cube, 16 - 20 November 1998."

Scientists from Brazil, Chile, Cuba, Guatemala, Mexico, Peru, Uruguay, and the United States of America participated and exchanged information on the results of their five-year research projects.

The results of the CRP demonstrated the effectiveness of irradiation to eliminate pathogens of the *Vibrionaceae*, including *Vibrio cholerae*, from raw oysters, mussels, clams, fish and shrimp. This "cold pasteurisation" process in oysters could be achieved at radiation doses as low as 1-2 kGy without killing the molluscs, thus allowing continued distribution in live form under refrigeration. It was also demonstrated that irradiation effectively prevents infectivity of cysticerci in hamsters after irradiation of infected pork at doses as low as 1.0 kGy, although 3.0 kGy were needed to fully prevent evagination of cysticerci. It is expected that the results of the various research projects will be published in 1999.

Common problems and aspects of interest were also noted, and various recommendations were made. Among these, that only standard methods, regardless of origin, be used in the research (e.g. USA-BAM, EU, Australian, etc.), as long as equivalence between the standard methods used for the same food group and microorganism by all CRP participants can be shown. It was also recommended that rapid microbiological methods be introduced in the research only in parallel to standard, conventional ones, and to limit the selection of such rapid methods to those that have already been validated or are at an advanced stage of validation.

Another important recommendation made by the meeting to participating institutions was to take immediate steps to lay the basis for a gradual but rapid upgrading of the quality assurance level in their microbiology laboratory, so as to achieve accreditation or an equivalent quality assurance level when funding does not permit accreditation. In addition, the FAO/IAEA Training and Reference Centre for Food and Pesticide Control was requested to promptly establish a proficiency testing programme for the laboratories participating in the CRP, and to assist laboratories achieve accreditation or equivalent quality assurance levels by providing expert services. This could serve also as a test programme for the Centre. Short-term training of technicians in the agreed rapid microbiological assays should take place in the laboratories of Research Agreement holders.A 7 to 15 days training period was suggested.

D. *STATUS OF EXISTING COORDINATED RESEARCH PROJECTS*

Impact of Long-Term Pesticide Usage on Soil Properties Using Radiotracer Techniques

In order to evaluate the effects of repeated, heavy applications of insecticides over many years on the biological activity of the soil and soil fertility, plots have been established by participants in fields with a long history of a monoculture, usually cotton but in some countries maize or potato. Control plots have been sited in the nearest practicable areas that have a history of low or zero pesticide use. A range of soil parameters is being measured including respiration quotient/biomass; capacity for Fe-III reduction; nitrification; capacity to mineralise (C-14 labelled) aromatic molecules; dehydrogenase activity; arginine deaminase activity; rates of binding and release of C-14 labelled molecules; ATP; and some assessments of bacterial and fungal populations.

The results reviewed at the second RCM held in Bangkok during 22 - 26 September 1997 have indicated that repeated applications of pesticides to cotton field plots over a period of two years result in initial effects on soil properties, particularly on soil biomass and populations of soil bacteria and fungi, but recovery occurs soon thereafter. It is too early to draw definite conclusions as the objective is to study the effect over at least 4-5 year period. The third and final RCM of the CRP is tentatively planned for Hangzhou, China, May, 1999.

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

The main purpose of this CRP, which has 10 Research Contracts and one Agreement, is to validate relatively cheap procedures based on thin layer chromatography (TLC) that can be used to screen food and environmental samples for pesticide residues to reduce the number that must be analysed by more elaborate nuclear and related techniques.

Through a Technical Contract, procedures were developed for extraction, clean-up and TLC analysis for screening cabbage, green peas, orange and tomatoes for 118 pesticide active ingredients and metabolites. The basic procedure involves gel permeation chromatographic cleanup and the use of a number of TLC detection methods based on the use of chemical and biochemical reagents. One or other of these reagents will allow most organophosphate, urea and triazine compounds to be detected at around 0.002 mg/kg and most others at 0.05 - 0.2 mg/kg. Only organochlorine and pyrethroid insecticides and sulfonylurea herbicides were not detected at *Codex Alimentarius* Extraneous Residue Limits.

The first RCM held in Hungary in early 1997 was used as a training workshop for participants. Method validation will proceed through interlaboratory comparisons with a range of matrices and pesticides. The second RCM was held in Vienna, Austria, 16 - 20 November 1998. The work plan for the CRP has been divided into two parts. Work has been completed on most parts of the first part of the work plan and considerable data were presented at the RCM by the participants. These data indicated that all participants were able to validate most of the methods for the detection of pesticides on TLC plates. The 'coefficient of variation' (CV%) were mostly low, indicating good repeatability of analyses. However, problems were faced in the use and application of gel permeation chromatograph (GPC) supplied to each participant. A visit to the IAEA Laboratories, Seibersdorf was organized for the RCM participants and they were able to see the functioning of a GPC of the same make. It is expected that now the GPC procedure will be validated and the participants will be able to start part-2 of the work plan which will involve the actual method validation.

Validation of Alternative Methods to Gas and High Performance Liquid Chromatography for Pesticide Residue Analysis in Grains

The objective of the CRP is to assist national monitoring laboratories to adapt and validate low cost procedures which can be used without sophisticated instrumentation for screening pesticide residues in samples of food grains for checking their compliance with Codes Maximum Residue Limits.

This CRP focuses on the application of thin layer chromatography in combination with bioassay detection methods for the determination of pesticide residues in grain corps. The advantage of the method is that it does not require continuous electric supply and can be used with limited laboratory equipment. Notwithstanding its simplicity, if TLC is applied by experienced analysts the results may comply with the ISO 25 quality requirements. The programme has 10 Research Contracts and one Research Agreement. Additional laboratories have expressed interest to join the programme in 1999. The first Research Co-ordination Meeting was held in Miskolc, Hungary, 30 March - 3 April 1998 in combination with an inter-regional Training Workshop on the Implementation of Quality Assurance and Quality Control Measures in Residue Analytical Laboratories. The contract holders also attended the training workshop, which gave them excellent opportunity to get acquainted with or upgrade their knowledge on the current requirements of quality control of analytical procedures. Consequently, during the RCM most of the time was spent on practicing the TLC detection methods. The participants gained hands on experience in the application of the five recommended detection methods, which will be adapted and expanded in their laboratories during the first 1.5 years of the project.

The work programme for the participating laboratories was finalised during the meeting. The implementation of the laboratory activities will start during the second part of 1998.

The progamme includes:

- adaptation and validation of a multi-residue procedure based on ethyl acetate extraction, gel permeation chromatographic cleanup and determination of the residues with three (optionally with additional two) detection methods;
- checking the reproducibility of RRf values of pesticide compounds;
- verification of the applicability of the procedure by inter-laboratory study;
- expansion of the list of detectable pesticides to cover those active ingredients which are authorised in the countries of participating laboratories;

The results of the inter-laboratory study will be evaluated and the experience of the participants will be exchanged during the second Research Co-ordination Meeting planned for early 2000. The programme will be completed by the end of 2001 with the evaluation of its results and findings during the third Research Co-ordination Meeting.

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

The overall objective of this CRP is to assist national food control authorities and institutions improve food safety and stimulate international trade in foods by determining profiles of (selected) human bacterial pathogens of concern to importers on (selected) raw materials and/or products, thereby increasing assurance in their food control measures. Foods that are microbiologically safe would be identified.

A second objective of the CRP is to support the activities of the FAO/IAEA Training and Reference Centre for Food and Pesticide Control of the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture under its mandate "to assist Member States and their institutions to fulfil requirements to support the implementation of international standards/agreements relevant to food safety and control, the safe use of pesticides and sanitary and phytosanitary measures by providing training, quality assurance services and technology transfer.

Scientists from food control laboratories in Austria, Australia, Brazil, China, Chile, Ghana, Indonesia, Korea, Mexico, Nigeria, Paraguay, the Philippines, South Africa and Thailand are participating in the CRP. The first RCM was held in Vienna in November 1998.

Production of Shelf Stable and Ready-to-eat Foods through High Dose Irradiation Processing

The objective of this CRP is to use medium (1-10 kGy) and high (10-50 kGy) doses of irradiation for the production of wholesome food with long shelf-life, especially composite, semi-preserved foods and prepared meals to be stored either under refrigeration or ambient temperature. It has 8 Research Contracts and 8 Research Agreements. The First RCM was held in Belfast, Northern Ireland from 9-13 September, 1996. The progress of work was reported at the Second RCM held in Beijing, China 4-8 May, 1998, which may be summarised as follows:

1. Irradiation with doses between 1 and 3 kGy can ensure microbiological safety of pre-packed, prepared vegetables and of chilled prepared meals stored under refrigeration. Irradiation within this dose range can also extend shelf life of the latter product as well as sliced ham left under refrigeration.

2. Shelf-stable ethnic dishes such as marinated fish in Indonesia (known locally as *pepes*) and meat kebabs in India could be prepared through a combination of heat treatment and high-dose irradiation (45 kGy). Such products could be kept for many months at ambient temperature in these countries.

3. Through inoculated pack studies using *C. sporogenes* spores, microbiological safety of shelf-stable high moisture meat and poultry dishes developed in South Africa was demonstrated.

4. Irradiation with doses up to 10 kGy together with other hurdles (low pH, low water activity and salt additives) improved microbiological quality and shelf-stability of intermediate moisture fish from Ghana; semi-dried pork from Thailand and intermediate moisture meat and chicken from India.

5. A number of packaging materials required for high-dose irradiation of food were evaluated with regard to their safety and integrity. Quality assurance guidelines were prepared for producing such packaging materials and packages for irradiated food. Effects of irradiation on edible (dairy protein based) packaging materials for some ready-to-eat food were evaluated.

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

This CRP plans to develop research data on analytical methods commonly employed by different laboratories involved in export-import food control. It will complement the work of the FAO/IAEA Training and Reference Centre for Food and Pesticide Control with regard to analytical methods for mycotoxin contamination of food and feed. Priorities will be given to methods used to detect and quantify mycotoxins in commodities which represent trade problems and are the object of present or planned regulatory activities. Research emphasis will also be in time and cost efficient methods with good performance characteristics (validation and quality assurance parameters) which have a realistic opportunity of being implemented in developing countries.

It is expected that research within this CRP will contribute to identification of high risk commodities and mycotoxins, improve understanding of analytical assays used for detecting mycotoxin contamination. It should enable food control laboratories in developing countries to effectively monitor the mycotoxin content in imports and exports by establishing a portfolio of appropriate validated analytical methods.

Institutions in Argentina, Australia, Brazil, Canada, China, Cuba, Egypt, Indonesia, Italy, Philippines, South Africa, UK, Uruguay, and USA are participating in this CRP.

E. INTERNATIONAL CONSULTATIVE GROUP ON FOOD IRRADIATION (ICGFI)

The 15th Annual Meeting of ICGFI was held at IAEA Headquarters, Vienna, 20-22 October 1998. It was attended by 40 designated experts from 26 governments which are members of ICGFI and 8 representatives of other countries, inter-governmental and non-governmental organisations, making it one of the largest ICGFI meetings ever held.

Extension of ICGFI Mandate

The highlight of the Meeting was the unanimous decision to extend the mandate of ICGFI for another 3 years, beyond the current mandate which will expire in May 1999, with a refocused work programme. The ICGFI Secretariat (Food and Environmental Protection Section) was asked to take steps to formalise the extension with FAO, IAEA and WHO and their Member States as appropriate.

Programme of Work and Budget for 1999

The Meeting also approved the Programme of Work and Budget for 1999 according to the following:

	Programme of Work	Estimated Budget (US$)
1.	***International Trade***	
a)	FIPCOS for Operators of Irradiation Facilities and Food Inspectors	35,000
b)	Working Group to Draft an International Standard on Irradiation as a Phytosanitary Treatment of Fresh Horticultural Commodities *(to be co-sponsored by IPPC)*	15,000
2.	***Legislation***	
a)	Amendments to Codex General Standard for Irradiated Food and Labelling Provision of Irradiated	5,000

	Ingredients under the Codex General Standard for Labelling of Pre-Packaged Food	
b)	Revision of ICGFI Codes of Good Irradiation Practice (10 in total) according to the format for Codex Codes of Practice	10,000

3. *Information Transfer*

a)	Publication of a Revised Brochure on "Facts about Food Irradiation"	In-kind
b)	Publication of a Consumer Brochure on "Benefits of Irradiation to Food Safety"	5,000
c)	Printing of "Poultry Document"	In-kind
d)	Home Page maintenance	No cost
e)	Printing of a Monograph on “Irradiation of Fish, Shellfish and Frog Legs”	5,000
f)	Preparation of Educational Materials on Food Irradiation	In-kind
g)	Preparation of Brochure on Application of “High-Dose Irradiation of Food”	15,000
h)	Peer Review of Report of Cyclobutanone Studies	No-cost

4. *Database*

Updating of current databases: clearances, national regulations, food irradiation facilities, authorised packaging materials, trainees, etc.	No cost

5. *Administration*

a)	One professional staff (part-time)	45,000
b)	One support staff	60,000
c)	Travel	10,000
d)	Miscellaneous (telephone, shipping, etc.)	5,000
	Total (cash)	210,000

ICGFI member governments pledged in cash and in-kind to support the above activities as approved by the Meeting. To facilitate the implementation of ICGFI activities and to assist the work of the Secretariat, the Meeting also approved an establishment of a **Bureau** consisting of Chairman, two Vice-Chairpersons, representatives of FAO, IAEA and WHO, with the representative of the IAEA serving as Secretary.

ICGFI Web Page

The Meeting was shown the ICGFI Web Page ***(http://www.iaea.org/icgfi)*** which went on line in August 1998. It attracted wide attention as within one month it received more than 20,000 hits on the Internet. ICGFI designated experts and interested parties were encouraged to contact the ICGFI Secretariat through the ***Feedback*** mechanism of the Web Page.

FAO/IAEA (WHO) INTERNATIONAL CONFERENCE ON ENSURING THE SAFETY AND QUALITY OF FOOD THROUGH RADIATION PROCESSING

Background: With the next millennium about to begin, will food irradiation play a vital role in the quality, safety of and trade in our food supplies for the next century? The answer to this question and many others will be discussed at an FAO/IAEA (WHO) International Conference organised for this purpose, tentatively planned for either Tunis, Tunisia or Izmir, Turkey, 19-22 October 1999.

Significant developments on the acceptance and application of food irradiation as a method to ensure food safety and quality and to facilitate food trade have occurred in recent years. Regulations on food irradiation in many countries either have been or are being harmonised based on the Codex General Standard for Irradiated Foods and relevant recommendations of the ICGFI. The number of irradiation facilities for treating food is increasing and many more are under construction or being planned. Consumers are getting accurate information and are beginning to appreciate the benefit of irradiated foods. Indeed, irradiated foods are being produced in increasing volume both for the food processing industry and retail sale. The potential of irradiation as a method to ensure the hygienic quality of food, especially those of animal origin, as a quarantine treatment of fresh horticultural commodities, and as a substitute for fumigants, has been realised. Irradiation is being considered as a legitimate sanitary and phytosanitary treatment of food and agricultural commodities based on the provisions of the Agreement on the Application of Sanitary and Phytosanitary Measures of the World Trade Organization. Thus, the prospects for food irradiation are very bright.

Objectives: This conference aims to bring together regulatory authorities, food scientists, food manufacturers, retailers, radiation processing industry and consumer organisations to assess recent developments and the role of food irradiation to ensure the safety and quality of food for the next century. The specific goals of the conference are to:

- assess the future role of irradiation to ensure hygienic quality of food (for food of both animal and plant origin);
- assess the future role of irradiation as a substitute for fumigation and to facilitate international trade in food and agricultural commodities;
- examine current regulatory practices in approving and controlling the application of food irradiation;
- discuss communication strategies for consumers and the food industry to expand the acceptance and application of this technology;
- identify key issues in further development of food irradiation to ensure safety and quality of food; and
- develop an agenda for research, development and application of food irradiation for the next century.

Participants: The conference will be of interest to food scientists, regulatory officials, policy makers in governments, food industry, and consumer organisations who deal with food safety, quality and trade.

***Technical Sessions*:** The following topics will be addressed:

1. **Harmonisation of Regulatory Aspects of Food Irradiation**
2. **Ensuring Hygienic Quality of Food (both animal and plant origin)**
3. **Enhancing Food Quality, Security and International Trade**
4. **Alternative to Methyl Bromide Fumigation - A Measure for Food Security**
5. **Market Development for Irradiated Food (in North America, Europe, Asia and the Pacific, Latin America, Africa)**
6. **Communication Strategies for Consumers and the Food Industry**

7. Economics of Irradiation Facilities (gamma, EB, X-rays)

8. Future Needs (Research, Developments, Technology Transfer, and Applications)

The official announcement of this Conference will be made by the IAEA once detailed administrative arrangements have been made with the host government and interested parties.

F. FAO/IAEA TRAINING AND REFERENCE CENTRE (TRC) FOR FOOD AND PESTICIDE CONTROL

The TRC is planned to be inaugurated in July 1999 in connection with an advanced Training Workshop entitled *"**Application of Quality Control/Quality Assurance Measures in Residue Analysis"*** to be organised in Seibersdorf Laboratories/Vienna. The exact date will be announced through our Web Home Page (http://www.iaea.org/trc/) and invitation letters.

Potential participants: Heads of analytical laboratories, quality assurance officers, senior analysts. Participants should have reasonable practical experience in basic techniques and methodology, and good command of English to be able to master the subjects taught.

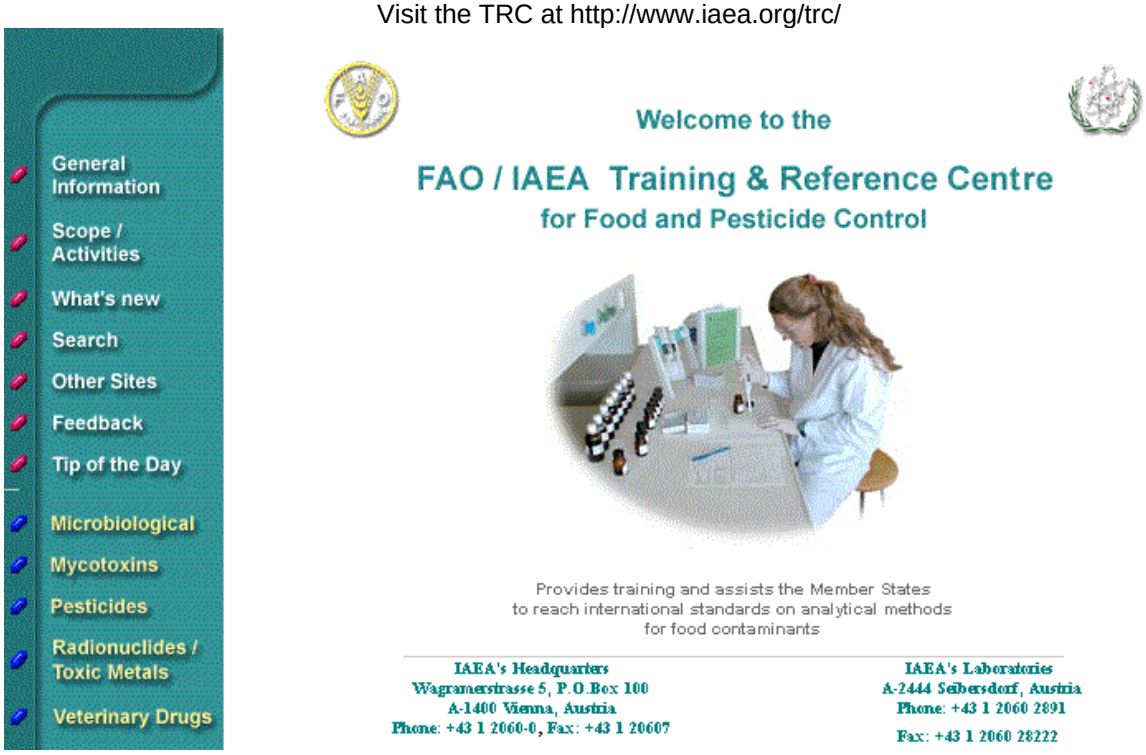
Topics to be covered: (both theory and practice)

Planning of experiments, field studies and surveys;
Analytical facilities required concerning the objectives of the tests;
Setting up task proposals;
Sampling and sample preparation;
Proper execution and quality control of basic laboratory operations (e.g., calibration of equipment and instruments, sampling, sample preparation, extraction, preparation and use of reference analytical standards, qualitative and quantitative determination etc.);
Basic principles and practice of chromatographic techniques;
Basic statistics;
Estimation of uncertainty of the results including sampling, sample preparation and analysis;
Detailed discussion of the criteria of ISO Guide 25 and GLP;
Role and responsibility of management, quality assurance officer, study director and other personnel;
Preparation of Quality Manual and SOPs
Internal quality control measures, system suitability tests;
Proficiency testing of laboratories;
Establishing quality assurance system;
Inspection of the laboratory, audit of the results;
Reporting and interpretation of the results in view of legal limits or other objectives (e.g. certification of residue concentration, dissipation of residues, environmental fate, effect of processing) of the analysis;
Current status of pesticide formulations, future trends;
Relation of application techniques and residue levels;
Use of analytical data to support decision making.

The practical and theoretical aspects of validation of methods for analysis of pesticide residues, veterinary drugs and mycotoxins will be discussed during an "***International Conference on Principles of Method Validation"***. The conference will be held in Budapest during 27-29 October, 1999. The conference will provide a forum for interested analyst to present research results, exchange experience, and discuss practical approaches. Further information on the above subjects can be obtained from Dr. Árpád Ambrus, (E-mail: a.ambrus@iaea.org ; fax: 43-1-260028222)

The FAO/IAEA Training and Reference Centre for Food and Pesticides (TRC) goes on-line

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



The TRC site focuses on food contaminants and residues. A navigation bar (left) guides users to relevant background information. “What’s new”, “Search” and “Tip of the Day” advise users how to find relevant information. “FeedBack” is an on-line message board and provides analysts an opportunity to share their experiences with one another.

“Microbiological”, “Mycotoxins”, “Pesticides”, “Radionuclides”, and “Veterinary Drugs” delves into the relevance to trade and opens a button bar that includes:

- training—fellowship and group training courses;
- research—CRPs and ongoing projects;
- meetings—what, where, when and who to contact;
- quality assurance—guidelines, standards, inter-laboratory comparisons and reference materials;
- bibliography—a list of annotated links by subject;
- other sites—currently over 500 annotated links to other organisational, governmental, educational and commercial links dealing with food safety and analytical methodology.

Additional buttons such as “HACCP” and “Risk analysis” are unique to the microbiological pages while “Pesticides” hosts a discussion group on method validation of concern to all laboratories. Method Validation is moderated by Dr. A. Ambrus and draws on a field of 30 international experts.

The TRC provides a rich resource base for the researchers, students, administrators or those seeking information about food safety issues. Set a bookmark to the TRC and watch for future developments such as a food contaminant and residue database and interactive tutorials.

News flash: Dr. John Skerritt (CSIRO Plant Industry) previewed the TRC site at the 4th International Conference of the Asia-Pacific Food Analysis Network, Chiang Mai, Thailand in November 1998. Feedback from participants was positive.

G. UPDATE ON THE ACTIVITIES OF THE AGROCHEMICALS UNIT

The Agrochemicals Unit continues work on the Harpenden multi-residue method. Results met requirements under the AOAC peer verified methods programme with recoveries of ^{14}C-chlorpyrifos from tomato better than 90% and CVs less than 2%. Experiments were replicated on three separate occasions and the method tested on other representative matrices including apple and lettuce. Fine tuning of the method is continuing to improve the methods applicability to laboratories in Member States. Nevertheless, the results demonstrate that the Agrochemicals Unit has the Harpenden multi-residue method in hand.

Dr. Ambrus attended the 9th IUPAC Congress of pesticide and presented a Plenary lecture entitled "Quality of Residue" (8A-0015) and four posters:

- Validation of Field Sampling Methods for Fruits of Medium Size(7B-0005);
- Distribution of Pesticide Residues in Fruits and Vegetables (8A-0001);
- Validation of Field Sampling Methods for Fruits of Medium Size (8A-0012);
- Distribution of Pesticide Residues in Fruits and Vegetables (8A-0013).

The Congress focused on the contributions technologies can make in the 21st century towards producing sufficient safe and wholesome food to feed the growing world population while minimising any adverse impacts upon the environment and its resources (water, soil and air). Key issues were benefits and risks and how precautionary we can afford be. For more information e-mail A.Ambrus@iaea.org.

The laboratory has a full programme planned for 1999 including:

Commissioning of the new laboratory

Validating analytical methods

- Validation of multi residue procedure (MRP) according to AOAC PVP and elaboration of practical approaches for validation of MRPs
- International workshop on method validation, consultant's meeting
- Checking storage stability of pesticide residues with labelled and unlabelled compounds & the study of sources of variability of MRPs

Maintaining laboratory procedures to comply with ISO 25 GLP

- Preparing Standard Operation Procedures and the Quality Manual, Record sheets for various laboratory operations and training manuals
- Gas and liquid chromatography, testing physical properties of pesticides, basic statistics
- Sampling, sample preparation
- GLP/ISO 25
- Extraction, cleanup techniques
- QA/QC in mycotoxin analysis
- Mass spectrometry
- Background documents for Workshop for Decision Making Managers
- Testing physical properties of pesticide formulations
- Organising training in standardised analytical procedures
- Training Workshop on Introduction of Quality Control/Quality Assurance Measures in Pesticide Residue Analytical Laboratories (2 courses/year)
- Workshop on Planning and Implementing Food Contaminant testing Programmes
- Training Course on Development of Quality Assurance for Mycotoxin Analysis
- Training Workshop on Introduction of Quality Control/Quality Assurance Measures in Pesticide Formulation Analysis
- Training workshop in general QA/QC

Developing and maintaining a global network of collaborating laboratories

Providing analytical quality assurance services

- Publication of the results of Inter-laboratory comparison test with ELISA DDT kit

Establishing an Internet database of analytical methods and other information

- Collection of relevant publications on analysis of relevant food contaminants
- Data base for analytical methods

Providing technical services

- Advising laboratories on analytical methodology, quality standards and instrumentation
- Technical back-up of laboratories

Donations

Two substantial donations were received for the FAO/IAEA Training and Reference Centre for Food and Pesticide Control:

DDT-DDE plate kits (EnviroLogix Inc. USA)

200 g chlorpyrifos (Dow AgroSciences Ltd UK).

Food and Environmental Protection Newsletter

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