



**Joint FAO/IAEA Programme**  
Nuclear Techniques in Food and Agriculture

# Food & Environmental Protection Newsletter

Vol. 11, No. 1

January 2008

<http://www-naweb.iaea.org/nafa/index.html>

ISSN 1020-6671

<http://www.fao.org/WAICENT/FAOINFO/AGRICULT/Default.htm>



## Contents

- To the Reader 1
- Staff 3
- Feature Article 4
- Past Events 6
- Forthcoming Events 10
- Status of Coordinated Research Projects 10
- Current Technical Cooperation Projects 13
- FAO/IAEA Agriculture & Biotechnology Laboratory, Seibersdorf 15
- Extending the use of the eLearning Platform 17
- Publications 17



## To the Reader

We are greatly pleased to inform you that on 16 July 2007, the Centro de Investigación en Contaminación Ambiental (CICA) of the University of Costa Rica was inaugurated as an IAEA Collaborating Centre for eLearning and Accelerated Capacity Building for Food and Environmental Protection (EACB). CICA was designated as the lead institution, or Collaborating Centre, acting in cooperation with the Advanced Radiation Technology Institute (ARTI) of the Korea Atomic Energy Research Institute and the Food Science and Technology Programme (FST) of the National University of Singapore.

An IAEA Collaborating Centre is an institution designated by the IAEA Deputy Director General to assist the IAEA in implementing its programme through research and development and training in any nuclear technology<sup>1</sup>.

Institutions that have the capacity to fulfill a function relevant to the Agency's programme, and institutions of high scientific and technical standing that have already attained international recognition, may qualify for designation as a centre. A department or laboratory within an institution, or a group of facilities for reference standards, research or training belonging to different institutions, may be designated as a centre, with one institution acting for them in relation with the Agency.



<sup>1</sup> <http://www-naweb.iaea.org/na/ccentres.html>

The mission of CICA is to determine the source and degree of environmental contamination and to promote sustainable development through international cooperation and regional training, research and consulting services. The CICA laboratories are accredited under ISO 17025. The laboratory and training complex include analytical laboratories for air and water quality as well as laboratories for pesticide chemistry. Areas of research and training include quality of surface and groundwater; air quality and acid rain; analysis of pesticides; pesticide fate and resistance; and analytical quality management.

The mission of ARTI is to develop state of the art nuclear technologies and to extend innovative and creative technologies for peaceful use. Facilities include a research farm unit; a gamma-greenhouse; gamma irradiation facilities for research and commercial purposes; an electron beam linear accelerator; ion beam facility; cyclotron; laboratory animal unit; and an international collaborating research centre. Areas of research and training include industrial applications of radiation technology; treatment of environmental pollutants; application of radiation to food science, biotechnology and agriculture; and radioisotope development.

A four-year B.Sc. Honours course forms the core of the FST programme. The course includes work experience in the food industry, highlighting the close linkage between the FST programme and industry. Graduate M.Sc. and Ph.D. research programmes strengthen that linkage by original research in six main subject areas, namely, indigenous foods/Asian foods; functional foods/nutraceuticals; natural flavour and aroma products;

minimal processing and dehydration; food engineering and process control; and microbiological aspects of Asian foods.

As stated in the IAEA Terms of Reference for Collaborating Centres, the participating EACB laboratories will align their related activities so as to complement FAO/IAEA activities in the field, including the utilization of eLearning to accelerate capacity building.

In the initial three-year trial period (2006-2009), the EACB Collaborating Centre will consult with the Agency within their specific areas of expertise in four major areas related to food safety and environmental protection, including, the implementation of Agency capacity building activities; the development, evaluation and application of new technologies; the enhancement of information collection and dissemination; and, the development of eLearning courses.

In closing, we wish to convey our heartiest congratulations to all three institutions participating in the EACB collaborating centre scheme, and look forward to our continued cooperation in the promotion of the food safety and environmental protection activities of the subprogramme.

Best wishes to you and your families for a happy, healthy and prosperous New Year.

Sincerely,

*David H. Byron*

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## Feature Article

### 7<sup>th</sup> IUPAC International Workshop on Crop Protection Chemistry and Regulatory Harmonization; Beijing, China, 9-12 October 2007

Technical Officer: Ian G. Ferris

The Workshop continues a long tradition of ensuring that scientists from developing countries are able to exchange information with scientists from around the world on pesticide related issues. The conference was conducted jointly with the 3<sup>rd</sup> International Symposium on Pesticide and Environmental Safety, hosted by Beijing Agricultural University, which also has close links to the Food and Environmental Protection subprogramme. More than 500 people participated in a very successful workshop<sup>2</sup>. Beijing proved an ideal venue showcasing what China has achieved in a decade through capacity building at all levels and creating incentives for discovering and adapting relevant foreign technologies to support the needs of industry and agriculture.

The plenary sessions outlined the challenges for agriculture and the environment and offered some solutions. The combination of population growth, increasing per capita food consumption, and growing demand for biofuels will require a second green revolution. Speakers were unanimous that this goal must be achieved with less agricultural inputs, most notably land and agrochemicals. There was general agreement that the required doubling of food production should be met, in part, by further reductions in pre- and post harvest losses and through integrated pest management (IPM) techniques. However, this will not be sufficient to meet projected needs. The agrochemical industry has had success with seed treatments such as Poncho Beta (60 g ai clothianidin + 8 g ai beta-cyfluthrin/100,000 seed)<sup>3</sup> that offer a better fit for IPM. They are also targeting yield increases using genomic approaches to follow-up on promising results with new active ingredients including Headline<sup>®</sup> (pyraclostrobin)<sup>4</sup>. Other innovations, including the use of genetically modified organisms (GMOs), while technically feasible, face uncertain public acceptance<sup>5</sup>. The same applies concerning easing demand for biofuels on primary agricultural land and emission of green house gases. The FAO and

IAEA are mandated to address these issues and opportunities exist for information/worksharing and accelerating technology transfer to developing countries.

There were six concurrent sessions at the workshop: Global Views and Harmonized Approaches to Pesticide Regulation; Pesticide Residues in Food and International Trade Standards; Environmental Safety Assessment of Pesticides; Pesticide Quality, Manufacturing and Specifications; New Pesticide Discovery and Synthesis; and Formulation and Application Techniques. This report covers some of the session highlights.

Since 1992, the OECD Pesticide Programme has worked to streamline the pesticide registration/re-registration process by helping governments work together to evaluate the risks of individual pesticides more quickly and thoroughly. To share information, governments must use the same or similar approaches and methods for managing pesticides. OECD has facilitated work sharing through the harmonization of approaches and methods, focussing in particular on how data are generated and assessed, formatted for reporting and reviewing and other issues that require international cooperation. The OECD harmonised templates are available on the Internet and can be downloaded from the OECD website<sup>6</sup>. Benefits from work sharing/harmonization are being realised for the registration of pesticide active ingredients by national authorities, the pesticide industry, grower organizations and consumers. Achievements to date include five joint reviews of new pesticide active ingredients in progress or recently completed involving three or more national authorities. Work completed through these joint reviews will be made available to the Joint Meeting on Pesticide Residues (JMPR) and the Codex Committee on Pesticide Residues for establishing Codex maximum residue limits (MRLs). OECD guidelines and innovations such as XML templates facilitate information sharing/translation, offer a means to reduce the lead-time for registration as well as cost savings. Harmonization of registration requirements is making progress via the OECD initiatives on International Harmonization on Pesticides through the OECD Pesticide Working Group (PWG). The OECD working group has numerous activities and projects underway. More comprehensive information about the OECD Pesticide Program can be found on their web site<sup>7</sup>.

The development of a new pesticide for registration in the USA costs over \$200 million. Thus agrochemical

<sup>2</sup> [http://www.pesticidechemistry.com/index\\_en.htm](http://www.pesticidechemistry.com/index_en.htm)

<sup>3</sup> [http://www.ars.usda.gov/research/publications/Publications.htm?seq\\_no\\_115=197827](http://www.ars.usda.gov/research/publications/Publications.htm?seq_no_115=197827)

<sup>4</sup> [http://cropwatch.unl.edu/archives/2007/crop18/corn\\_fungicide.htm](http://cropwatch.unl.edu/archives/2007/crop18/corn_fungicide.htm)

<sup>5</sup> <http://www.agronomica.org/Public%20Attitudes%20towards%20GM.doc>

<sup>6</sup> [http://www.oecd.org/document/13/0,3343,en\\_2649\\_34365\\_36206733\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/13/0,3343,en_2649_34365_36206733_1_1_1_1,00.html)

<sup>7</sup> [http://www.oecd.org/departement/0,3355,en\\_2649\\_34383\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/departement/0,3355,en_2649_34383_1_1_1_1,00.html)

companies focus their efforts on larger scale crops, such as maize, soybeans, wheat, oats, rice and cotton. Speciality crops, that typically include most vegetables, fruits, nuts, herbs, spices, nursery and landscape plants and flowers, are often left without legal access to the pesticides that are registered on major crops. There is insufficient financial incentive for the agrochemicals industry to invest in registering protection tools for these crops. This, coupled with potential liability issues from crop injury on speciality crops, leads to an unfavourable risk-reward relationship for registrants and leaves speciality crop growers with few pest management tools. In 1963, State agricultural experiment stations with the US Department of Agriculture (USDA) organised the successful Interregional Research Project No. 4 (IR-4). Crop grouping facilitates the establishment of residue tolerances for a group of crops based on residue data for certain key crops that are representative of the entire group. Developing research data for representative crops has saved time and money as well regulatory review costs. Speciality crop growers throughout the world are facing new challenges in international trade due to the lack of established international MRLs and/or failure to harmonize MRLs<sup>8</sup>. IR-4's Global Speciality Crop Initiative/Global Vision is providing expertise to minimise trade issues and support the international harmonisation of product registrations while promoting the use of new, safer pest control products. There was good support for the December 2007 IR-4 initiative hosted by FAO<sup>9</sup>.

The International Code of Conduct on the Distribution and Use of Pesticides<sup>10</sup> is one of the first voluntary Codes of Conduct to support food security, protection of human health, protection of the environment, and development of sustainable agriculture. It was offered by FAO and WHO as the global standard to improve pesticide management. The code provides guidance for all stakeholders on issues related to risk reduction in agriculture and public health. It recites important principles for all to follow in virtually every aspect of agricultural practice, particularly useful in ensuring that the pesticides are of high quality and meet rigorous safety requirements demanded by governments, agricultural workers and consumers<sup>11</sup>. The code promotes high

standards that ensure the maintenance of good environmental concepts, economic manageability and overall sustainability of good agricultural practices (GAPs) round the world. The code is an international reference for all participants in global agriculture and is the principle document that is embodied with significant moral authority. Consequently most governments, companies and other stakeholders tend to observe the tenants of the code and most have confirmed publicly that their conduct is in accordance with the principles of the code. Hence substandard/illegal pesticide formulations require strong action by national enforcement. It was recommended strongly that the code be employed as the primary tool to safeguard the quality of pesticide products worldwide. In this regard, the FAO/WHO pesticide specifications provide an international reference against which the quality of products can be judged either for regulatory purposes or in commercial dealings. The applications of FAO/WHO specifications would enhance confidence in their purchase. Since 2007, FAO/WHO have evaluated 108 submissions for pesticide specifications. Manufacturers from R&D-driven companies all participate in this process.

Selective herbicide spot spraying technology was commercialised in the USA several years ago and is being applied worldwide, especially for fallow weed control. An equally important development is the proof-of-concept of a new orchard sprayer. The prevention and eradication of plant diseases and orchard insect pests are essential requirements to command premiums for high quality produce. At the same time, MRLs should not be exceeded even though fungicides and insecticides are typically applied later than herbicides and hence are more problematic in terms of food residues. Professor He Xiongui from China Agricultural University reported reductions in pesticide application in orchards by 35 to 50% compared to conventional sprayers and an impressive 7-fold reduction in drift. The tractor-mounted sprayer uses a newly developed infrared detector for targeting trees, turbine air-assist to ensure good canopy penetration and an electrostatic sprayer to optimize pesticide coverage of upper and lower leaf surfaces.

In recent years, more selective, less toxic and persistence "new" generation pesticides have replaced the older generation pesticides in many countries. These new pesticides and their degradation products or metabolites are often either more polar or non-volatile, and thus cannot be analyzed by gas chromatography. Liquid chromatography-tandem mass spectrometry (LC-MS/MS) has rapidly progressed from being a research technique to a routine analytical procedure. The use of LC-MS/MS in residue analysis has enhanced labora-

<sup>8</sup>Scheepers, Jooste A. and Alemu. Z.G. 2007. Quantifying the impact of phytosanitary standards with specific reference to MRLs on the trade flow of South African avocados to the EU (<http://ageconsearch.umn.edu/bitstream/123456789/26428/1/46020260.pdf>)

<sup>9</sup><http://www.fao.org/ag/agp/agpp/pesticide/events/c.htm>

<sup>10</sup>[http://www.fao.org/WAICENT/FAOINFO/AGRICULT/AGP/AGPP/Pesticid/Code/PM\\_Code.htm](http://www.fao.org/WAICENT/FAOINFO/AGRICULT/AGP/AGPP/Pesticid/Code/PM_Code.htm)

<sup>11</sup> There is also a need for capacity building to address problems such as knapsack sprayers without a pressure gauge/regulator or meeting minimum design and safety requirements (Herbst A. He. Z. A Survey on Chinese Knapsack Sprayers. 7<sup>th</sup> IUPAC International Workshop on Crop Protec-

tion Chemistry and Regulatory Harmonization, Beijing October 9-13, 2007 465-476).

tory's capability by providing a more detailed picture of pesticide residues and compliance with GAP. Zhang and Rose (2007) compared GC/MS and LC-MS/MS for monitoring Victorian produce. Fig. 1 summarizes the number of unacceptable residues detected in the past four years. This clearly shows that, since the introduction of LC-MS/MS, there has been a considerable increase in the number of unacceptable residues detected, particularly in 2005-2006. More accurate detection of residues provides an opportunity for early detection of pesticide misuse and allows for corrective action before there is a significant impact on exported produce. This approach will become increasingly important as LC-MS/MS is accepted as the benchmark for multi-residue monitoring, identification and quantification of a range of non-volatile, polar pesticides at part-per-billion levels ( $\mu\text{g}/\text{kg}$ ).

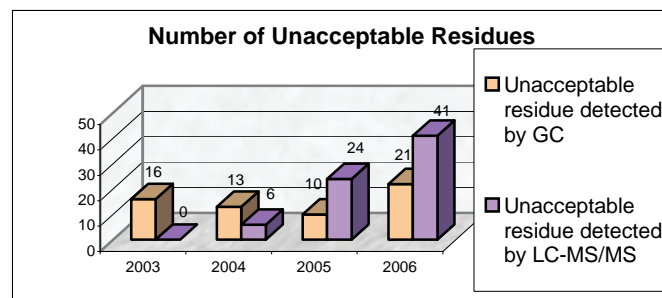


Fig. 1 Zhang, P. and G. Rose. 2007. Liquid chromatography-tandem mass spectrometry enhances pesticide residue analysis capability: application to the annual Victorian Produce Monitoring Program. 7<sup>th</sup> IUPAC International Workshop on Crop Protection Chemistry and Regulatory Harmonization, Beijing October 9-13, 2007.

## Past Events

### Saskatoon International Workshop on Validation and Regulatory Analysis; Saskatoon, Canada, 10-13 June 2007

Technical Officer: Andrew Cannavan

The Agrochemicals Unit Head participated in the Saskatoon International Workshop on Validation and Regulatory Analysis (SaskVal 2007) in Saskatoon, Saskatchewan, Canada from 10 to 13 June 2007. The Unit Head presented a keynote lecture on 'Developing Country Regulatory Concerns and Collaborative Work to Protect Consumers and Facilitate International Trade', including a summary of the work of the Joint FAO/IAEA Programme in this field, co-chaired a plenary session on 'Risk assessment: the role of expert laboratories', and presented a poster on work carried out in the Agrochemicals Unit, Agriculture and Biotechnology Laboratory, Seibersdorf, entitled 'Comparison of Methods for the Estimation of Measurement Uncertainty for an Analytical Method for Sulphonamides'. The workshop had approximately 120 participants, including a number of representatives of developing countries. Two technical cooperation project (TCP) counterparts and several coordinated research project (CRP) scientific investigators were present, and some results of the recently completed CRP "Development of Strategies for the Effective Monitoring of Veterinary Drug Residues in Animals and Animal Products in Developing Countries" (D3.20.22) were presented, both orally and as posters.

The workshop was successful, facilitating discussion and feedback on technical and regulatory issues relevant to participants from both developed and developing countries. It provided a good opportunity to build awareness

of the IAEA's role in food safety and quality issues, and resulted in several new collaborations or potential collaborations which will assist Member States.

### IAEA/RCA Project Planning Meeting on Novel Applications of Food Irradiation Technology for Improving Socioeconomic Development; Bali, Indonesia, 16-20 July 2007

Technical Officer: Tatiana Rubio Cabello

As the use of commercial food irradiation expands, there is a greater demand for irradiation facilities. There are also public misconceptions and negative attitudes regarding the use of cobalt-60 as well as the handling and transportation of radioactive materials. Therefore, there is a need to utilize other types of ionizing radiation, primarily electron beam and X-ray sources. Moreover, electron beam facilities have an advantage over cobalt-60 plants in terms of safety and transportation of source materials. Furthermore, electron beam facilities can quickly process large volumes of materials such as fresh fruits and vegetables as well as frozen foods. Under these circumstances, it was considered appropriate to be prepared for radiation processing using the electron beam technology for selected important commodities typical of the region.

The specific objectives of the project are to develop process parameters for the sanitary applications of radiation using electron beam irradiation of selected food items. Another important objective of the project is to elaborate quarantine treatment protocols of irradiation technology for some important fresh fruits of the region to encourage greater international trade and consumption. The project also covers activities to create awareness of these tech-

nologies with appropriate quarantine and food control authorities in the regional cooperative agreement (RCA) member states in Asia as well as to assist with the technical inputs for those involved in drafting legislation for the application of the technology.

The Planning Meeting of this project was held at the Ramayana Hotel, Bali, Indonesia from 16 to 20 July 2007 to review the current needs of Member States in food irradiation and to finalize the regional work plan of the project in consultation with the national project coordinators.

The meeting was attended by the project national coordinators of the 13 participating RCA Member States.

The meeting was inaugurated by Dr. Pramudita Anggraita, Deputy Chairman, BATAN, Indonesia and the National RCA Representative of Indonesia. Dr. Anggraita emphasized the role of food irradiation in food security, safety, and international trade and the current developments and prospects of this technology in Indonesia. Mr. Prinath Dias, the RCA focal person, welcomed the participants on behalf of the IAEA and thanked the government of Indonesia for hosting the meeting. He also gave a brief overview of the relevance of the meeting.

During the meeting, all participants presented their reports, and a final work plan for the project was agreed upon. The agenda also included a visit to a company which is sending some of its products (spices) for treatment at an irradiation plant in Jakarta.

The meeting was successfully accomplished, and the objectives of the meeting achieved.

### **Joint FAO/IAEA Programme at the Joint FAO/IAEA/OIE/WHO Technical Meeting on Global Survey of Laboratory Quality Systems; Lyon, France, 30 August 2007**

Technical Officer: Andrew Cannavan

The Agrochemicals Unit Head travelled to the WHO Lyon Office to represent the Joint FAO/IAEA Programme at the Joint FAO/IAEA/OIE/WHO Technical Meeting on Global Survey of Laboratory Quality Systems. A strategy for developing a global inventory of laboratory quality systems and external quality assessment schemes (EQAs) was discussed at the meeting. The aim is to help UN and other capacity building organizations to identify gaps and needs in laboratory networks involved in providing a response to prevent the spread of disease through the notification of all public health emergencies and issues of international concern in accordance with the International Health Regulations (2005). A two-part questionnaire was designed for distribution to laboratories, competent authorities and EQA providers and a preliminary survey to test the questionnaires in a limited

number of countries was initiated in late October - November. A time line was proposed which would produce data from the full survey by the end of the first quarter of 2008. The data collected will be validated, collated and analyzed by the WHO office in Lyon. The final inventory will be published and disseminated globally.

### **Regional Workshop on the Use of Irradiation as a Phytosanitary Treatment; Mexico City, Mexico, 1-5 October 2007**

Technical Officer: Tatiana Rubio Cabello

The approval and commercial adoption of irradiation as a quarantine treatment for agricultural commodities is gaining acceptance worldwide. The effectiveness of irradiation as a broad spectrum quarantine treatment of fresh fruits and vegetables was recognized by the North American Plant Protection Organization (NAPPO) in 1989, followed by other plant protection organizations (PPO) thereafter. These include American Regional Plant Protection Organizations (RPPOs), such as the Southern Cone Plant Health Committee (COSAVE) and the International Regional Organization for Plant and Animal Health (OIRSA), which operate under the International Plant Protection Convention (IPPC). In fact, this recognition was essential during the discussions, and later the adoption (period 2001-2003) of the ISPM No. 18 Guidelines for the Use of Irradiation as a Phytosanitary Treatment at the Interim Commission on Phytosanitary Measures (ICPM) meetings.

In 1989, the Animal and Plant Health Inspection Service (APHIS) of the United States Department of Agriculture (USDA) – the agency responsible for promulgating regulations dealing with quarantine treatments – published the first rule to allow the use of irradiation as a phytosanitary treatment. APHIS later decided to expand its regulatory framework to the approval of doses for irradiation treatments of imported fruits and vegetables; the Final Rule was published in January 2006. Through publication of these rules, the United States of America has made clear its acceptance of irradiation as a phytosanitary/quarantine measure. In 2007, the USA has already received the first consignments of irradiated fresh fruits from Asia, and this fact has generated enormous interest in other countries of the world, including many Latin American and Caribbean countries.

The Food and Environmental Protection subprogramme of the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, recognizing the importance of the use of irradiation as a quarantine treatment in the American region, decided to organize a regional workshop on this subject in 2007. The objective of the workshop was to enhance knowledge and provide up-to-date information on the use of irradiation as a quarantine treatment as well as to discuss potential future activities.

This workshop was held at the Hotel Royal Plaza, Mexico City from 1 to 5 October 2007, and was attended by nearly 70 participants from 21 countries. The participants were mainly senior officials from the American region who were responsible for policies and regulations in the area of phytosanitary measures for food; quarantine officials; representatives of three regional plant protection organizations; exporters; importers; and professionals working in related areas.

The workshop was opened by Mr. Javier Trujillo, Director General of Plant Protection at the Ministry of Agriculture in Mexico, who emphasized the importance of applying irradiation technology as an alternative to the use of fumigants. Mr. Trujillo also mentioned that during the next weeks, Mexico would approve the national standard for using irradiation as a quarantine measure; and that the country would send the first consignments of irradiated fruits to the US market in 2008.

During the opening ceremony, Mr. Allan Hruska, a representative of the FAO Regional Office for Latin America and the Caribbean, said that FAO was interested in helping Member States to apply efficient quarantine treatments to be more competitive in international markets, and that irradiation seems to be one of the best alternative treatments.

The workshop included presentations on basic aspects of food irradiation; global developments; present and future activities; international standards on food irradiation; the effect of irradiation in insects and mites; research, use of irradiation as a post-harvest treatment; dosimetry and process control; trade of irradiated foods; experiences and regulatory aspects on the practical application of irradiation as a phytosanitary treatment in the USA and other selected countries; and consumer acceptance and economical feasibility of food irradiation technology. The program also included a scientific tour of the commercial irradiation plant in Mexico located in Tepeji del Rio, Hidalgo. This facility has been in operation since 2000.

The workshop was an enormous success in terms of objectives fulfilled, number of participants, and interest generated.

It was verified that there is an urgent need to start as soon as possible with capacity building for the plant protection quarantine officers from the NPPO in their responsibilities for the phytosanitary aspects of evaluation and verification systems, certification systems, management systems, and safeguarding.

## **23<sup>rd</sup> Meeting of the Radiation Safety Standards Committee (RASSC); IAEA Headquarters, Vienna, Austria, 15-18 October 2007**

Technical Officer: David H. Byron

The Radiation Safety Standards Committee (RASSC) is a standing body of senior experts in radiation safety, established by the IAEA Deputy Director General of the Department of Nuclear Safety and Security. RASSC advises the Deputy Director General on the overall programme for the development, review and revision of standards relating to radiation safety. Its objective is to achieve consensus, quality, coherence and consistency in the development of international standards for radiation safety.

The functions of RASSC are:

- To advise on the approach to the development of the radiation safety standards issued in the IAEA Safety Standards Series, covering Safety Fundamentals, Safety Requirements and Safety Guides, both thematic and practice specific, and to advise on priorities.
- To review proposals for the development of new standards relating to radiation safety and to approve the relevant document preparation profiles (DPPs) prior to their submission to the Commission on IAEA Safety Standards.
- To review draft radiation safety standards, considering, throughout the preparation and review process, the value of each draft standard and the needs of users of the standards.
- To approve the text of draft radiation safety standards prior to their submission to Member States for comment and again prior to their submission to the Commission, in accordance with the established procedure.
- To ensure a broad international input in the preparation and review of radiation safety standards.
- To advise on radiation safety standards, relevant regulatory issues and activities for supporting the use and application of IAEA Safety Standards.
- To advise on the timely review of and the need for revision of published safety standards.

Specialized international organizations and relevant non-governmental bodies may be invited by the IAEA Deputy Director General to attend the RASSC meetings and in this regard, a representative of the FAO attended the most recent 23<sup>rd</sup> Meeting of the RASSC to report that follow-



ing the successful hosting of the 19<sup>th</sup> Regular Meeting of the Inter-Agency Committee on Response to Nuclear Accidents (IACRNA) at FAO Headquarters (Rome) in April 2007 (see July 2007 Newsletter), revised Cooperative Arrangements between FAO and IAEA specific to nuclear and radiological emergencies affecting food and agriculture were finalized and signed by the respective organizations in July 2007. The FAO representative noted that these activities were part of the continuing efforts of the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture towards assisting Member States in the application of agricultural countermeasures to alleviate adverse affects arising from nuclear-related events.

The FAO representative also indicated that a member of FAO headquarters staff, as well as the FAO Representative in Mexico, participated in the recently held planning meeting for the ConvEx-3 international emergency response exercise at the Laguna Verde Nuclear Power Plant in Veracruz City, Mexico, from 2 to 4 October 2007. It was reported that positive discussions took place between the FAO representatives and their Mexican counterparts concerning the inclusion of exercise parameters related to the contamination of food and agricultural commodities during ConvEx-3, which is scheduled to be held in July 2008.

The FAO representative also participated in RASSC discussions concerning the review and revision of the International Basic Safety Standards for Protection against Ionizing Radiation and for the Safety of Radiation Sources (BSS) as a cosponsoring organization, particularly in regard to the development of emergency preparedness and response procedures for nuclear and radiological emergencies affecting agriculture.

The final report of the 23<sup>rd</sup> RASSC will soon be available at:

<http://www-ns.iaea.org/committees/default.asp>

### **Training Course on Electron Beam Applications on Fruits and Frozen Foods; Ho-Chi-Minh City, Vietnam, 5-9 November 2007**

Technical Officer: Tatiana Rubio Cabello

Under the technical cooperation project on "Novel Applications of Food Irradiation Technology for Improving Socio-Economic Development" (RAS5046), a training course on electron beam applications in fruits and frozen foods was organized in Ho-Chi-Minh City, Vietnam from 5 to 9 November 2007.

The training course was held at the Victory Hotel and was attended by 21 participants and four observers from 11 countries. The participants were mainly professionals

working in food irradiation technology or food industry (mainly fruits and foods of animal origin), food legislators and decision makers from the sector of planning on food and nutrition.

The topics covered during the course included basic aspects of food irradiation technology; an overview of sanitary and phytosanitary measures; types of technologies available and their cost; legislation requirements and relevant standards; dosimetry; applications and design of electron beam/X-ray technologies; an overview of irradiation and sanitary and phytosanitary measures in the United States; and irradiation as a sanitary measure in France and Vietnam. This was followed by country reports. The agenda also included a field visit to Son Son Co. Ltd., an electron beam facility treating fruits, vegetables and also frozen seafood products.



*Participants at the regional training course at the Victory Hotel in Ho-Chi-Minh City, Vietnam.*

The participants agreed that the training course was very important to improve their knowledge regarding food irradiation technology in general; and the use of electron beam and X-ray machines in particular. The training course was also very valuable in terms of interchange of technical information and experiences.

### **3<sup>rd</sup> International Symposium on Recent Advances in Food Analysis; Prague, Czech Republic, 7-9 November 2007**

Technical Officer: Marivil Islam

A member of the Agrochemicals Unit staff, Ms. Marivil Islam, participated in the 3<sup>rd</sup> International Symposium on Recent Advances in Food Analysis, organized jointly by the Institute of Chemical Technology, the International Association of Environmental Analytical Chemistry, and the RIKILT Institute of Food Safety. The three-day symposium took place at Diplomat Hotel Conference Centre in Prague, Czech Republic. It was attended by approximately 350 participants, comprising laboratory analysts, researchers, university professors, Ph.D. students, etc. The symposium focused on advanced analytical technologies and food-related applications and presentations were made by leading scientists and invited lecturers through oral and poster presentations. Young scientists

are also given the opportunity to present their work and stimulate discussions among the participants. Ms. Islam presented a poster on work carried out in the Agrochemicals Unit on the development and validation of a robust liquid chromatography tandem mass spectrometry method for the confirmatory analysis of sulphonamide antimicrobial residues in foods.

Various facets of food safety analysis gained through the symposium will be applied in the research and development activities of the Agrochemicals Unit and will, to a large extent, be transferred to fellows, interns and project counterparts.

## Forthcoming Events

### **40<sup>th</sup> Session of the Codex Committee on Pesticide Residues (CCPR); Beijing, China, 14-19 April 2008**

Technical Officer: Josef Brodesser

The 40<sup>th</sup> Session of the CCPR will be held in Beijing, China from 14 to 19 April 2008. The Food and Environmental Protection Subprogramme (FEP) of the Joint FAO/IAEA Division continues to assist the Joint FAO/WHO Codex Alimentarius Commission in the elaboration of Codex standards and guidelines related to pesticide residues and food safety.

The practical application of the Measurement Uncertainty (MU) approach remains to be problematic, especially for pesticide residue analysis laboratories. Theoretical formulas for calculating MU continue to present difficulties in translating the strict mathematical bottom-up concept into daily laboratory work. The combination of a huge number of individual pesticides, in conjunction with numerous matrices and different concentration levels, make systematic calculations of individual MU budgets extremely laborious. Efforts for simplifying the concept, including the development of a guidance document on the estimation of uncertainty of

results for the determination of pesticide residues, are being taken through the IAEA coordinated CCPR Electronic Working Group which is hosted through the FEP web site (see also under eLearning).

The IAEA website, which contains available abstracts and collections of validated or official analytical methods used worldwide, will also be extended. Links and collections or abstracts, respectively, can be downloaded from <http://www-infocris.iaea.org/Download/Methods-Main.pdf>. Currently, contributions have been received from Argentina, Canada, Costa Rica, Brazil, Denmark, Germany, Republic of Korea, The Netherlands, UK and USA. More methods will be uploaded when available.

Moreover, the CCPR Ad hoc Working Group on Methods of Analysis and Sampling, which is chaired by the FEP, is dealing with open points related to pesticide residues in milk and milk products. There are still discrepancies, particularly relevant to international trade, as to whether the determination and expression of pesticide residues should be in whole product or based on fat content. Clarification is being sought by the Ad Hoc Working Group.

## Status of Coordinated Research Projects

### **1<sup>st</sup> Research Coordination Meeting of the Coordinated Research Project on Integrated Analytical Approaches to Assess Indicators of the Effectiveness of Pesticide Management Practices at a Catchment Scale (D5.20.35)**

Technical Officer: Britt Maestroni

The 1<sup>st</sup> Research Coordination Meeting (RCM) of the FAO/IAEA Coordinated Research Project (CRP) on Integrated Analytical Approaches to Assess Indicators of the Effectiveness of Pesticide Management Practices at a Catchment Scale was held at the Centro de Investigación en Contaminación Ambiental (CICA), Universi-

dad de Costa Rica, in San José, Costa Rica from 9 to 13 July 2007.

The meeting was attended by research contract and agreement holders from Argentina, Australia, Brazil, Bulgaria, Chile, China, Costa Rica, Cyprus, Ecuador, Germany, Kenya, India, The Philippines, Sweden, as well as observers from Costa Rica, Canada and the IAEA.

The programme of the meeting included presentations on the results of the Consultants' Meeting held at IAEA Headquarters from 6 to 9 June 2006, including the specific objectives defined for the CRP; a review of the current regional initiatives in the context of integrated analytical approaches to assess the implementation of

good agricultural practices (GAP); insights into agricultural non point-source contamination and pesticide monitoring based on first tier risk assessment; the minimum sampling requirements for trend analysis of GAP; available protocols for the analysis of pesticides in water; current water monitoring activities in Cyprus; an introduction to ecological risk assessment, and an example of use of pesticide impact rating index (PIRI) software.



*Participants at the 1<sup>st</sup> Research Coordination Meeting (RCM) of the FAO/IAEA Coordinated Research Project (CRP) on Integrated Analytical Approaches to Assess Indicators of the Effectiveness of Pesticide Management Practices at a Catchment Scale*

One afternoon was spent at the CICA-UCR laboratory and two protocols for the analysis of pesticides in water were demonstrated to participants. Demonstrations were also given on available FAO/IAEA web resources, such as eLearning courses and LIMS resources.

The discussions among Research Contract/Agreement Holders lead to the preparation of an overall work plan for the next two years of the project.

The establishment of a global network of laboratories will be one of the project's main achievements. Equally important is the information generated under the CRP, which will give a greater understanding of environmental indicators and their relationships to GAP, thus helping to improve pesticide management and facilitate agricultural exports.

The second RCM is planned to take place in Vienna, Austria, from 9 to 13 February 2009.

### **3<sup>rd</sup> Research Coordination Meeting of the Coordinated Research Project on Testing the Efficiency and Uncertainty of Sample Processing for Analysis of Food Contaminants (D6.10.23)**

Technical Officer: Josef Brodesser

The 3<sup>rd</sup> Research Coordination Meeting (RCM) of the Coordinated Research Project (CRP) on Testing the Efficiency and Uncertainty of Sample Processing for Analysis of Food Contaminants was held in Neuquén, Argentina, from 1 to 5 October 2007. Seven CRP participants and one observer took part.

The overall goal of the CRP was to investigate the behavior of pesticide residues under different sample preparation conditions. For this purpose, the behavior of pesticide active ingredients under cryogenic conditions has been compared with processing at room temperature, which is the current common practice world wide. Due to differing activities of enzymes during homogenization and extraction, the results of analysis procedures may also become different. It therefore may not only depend on the unavoidable spread of results attributable to systematic and non-systematic errors, but also through the inherent uncertainty budgets. The relevance of these additional sources of variability is related especially to the interpretation of analytical results with respect to the violation of MRLs. Analytical laboratories certifying exportable commodities should therefore for example take into consideration the contribution of this component of variability in the evaluation of analytical results to ensure a realistic estimation of the overall uncertainty budget and to avoid disputes about MRL violations.

The CRP work programme is in its fifth and last phase. Work is being concluded with certain supplementary research work until the end of January 2008. The recent focus was on additional food commodities and the extension of pesticide components investigated. Additional trials were conducted on the stability of active ingredients under cryogenic processing and ambient temperature.

Large crops, such as watermelons and jack fruits, were included. Systematic investigations of residues on the different quadrants of such commodities resulted in different contents of pesticide residues detected. There is considerable variation depending on which part of the crop is analyzed. Obviously, the individual crops have higher concentrations of residues on the exposed side of the fruit when pesticides are regularly sprayed. This could be expected, but this fact is not covered sufficiently by the existing Codex sampling guidelines and nor in the evaluation of the variability of residue values and its contribution to the overall uncertainty of ana-

lytical results. This again can lead to overly narrow uncertainty ranges assigned to analytical results, particularly as the sampling component is included in the final result. The inherent variability and uncertainty of overall results therefore are underestimated regarding the representativeness of sampling and may give rise to disputes about the acceptability of residue concentrations in terms of current MRL evaluation practices.

Prior to the RCM, the XV Congress of Toxicology Argentina took place in Neuquén from 26 to 28 September 2007. This regional congress was organized by the University of Neuquén. Plenary lectures and poster sessions were presented, among others, on pesticide toxicology and food safety, laboratory techniques and quality management. IAEA also contributed in the pre-congress workshop by lecturing on ISO 17025 principles and systematic method validation.

The overall CRP results are due to be compiled in an IAEA TECDOC in 2008.

### **1<sup>st</sup> Research Coordination Meeting of the Coordinated Research Project on Applications of Radiotracer and Radioassay Technologies to Seafood Safety Risk Analysis (K4.10.10)**

Technical Officer: David H. Byron

The 1<sup>st</sup> Research Coordination Meeting (RCM) for the Research Coordination Project (CRP) on Applications of Radiotracer and Radioassay Technologies to Seafood Safety Risk Analysis met at the IAEA Marine Environment Laboratories in Monaco from 20 to 23 November 2007. The Meeting was chaired by D. Byron and R. Jeffree acted as Scientific Secretary.

The RCM recalled that the broad objective of the CRP was to generate data on priority contaminants in seafood organisms with regard to human consumption, sale and export, and to assess the application and relevance of these experimentally-derived and field-based data to the management of these contaminants in seafood.

The general objectives of the RCM were to:

- Discuss the proposed plans of the individual participants, including their relationship to the overall CRP objectives
- Examine areas of potential interaction between the participants
- Prepare a set of recommendations to facilitate the project tasks

- Review the CRP Project Framework for possible modifications.

It was further noted that the CRP would optimally generate scientifically sound outputs and outcomes related to seafood contamination and considering international standardization activities, including the:

- generation of quality-assured field data on contaminant levels in target biota, using reference material
- interpretation of data underpinned by mechanistic understandings, based on radio-assay/tracer experimental studies
- acceptance of data into JECFA evaluations to facilitate decision-making on toxicological evaluations of acceptable background levels in seafood and/or advice from JECFA on what additional data would be needed
- JECFA and/or related expert committee assessments of seafood contaminants based on the CRP data provided and leading to the potential establishment of maximum levels for the protection of public health and the facilitation of international trade, particularly for developing countries.

The report of the meeting, including the conclusions and recommendations, participating country progress reports, specific subject area reports (Codex/JECFA) and the List of Participants will be available on the Marine Environment Laboratory website in the near future at <http://www-naweb.iaea.org/naml/default.asp>

### **Outcomes of the Coordinated Research Project on Quality Control of Pesticide Products (D5.40.03)**

Technical Officer: Josef Brodesser

The aim of the CRP, conducted from 2000 to 2006, was the combining and merging of single component analytical methods towards multi-method approaches. Multi-method analytical approaches investigated in the CRP were verified on a representative number of real and synthetic pesticide formulation samples.

The CRP outcomes have been compiled towards the publication of the IAEA TECDOC. Beyond reporting of results it will focus on detailed instructions on how to elaborate and implement multi-method approaches in pesticide formulation analysis. The publication of the IAEA TECDOC is planned for the first quarter 2008.

## Current Technical Cooperation Projects

Project Number	Title	Technical Officer
ALG5025	Strengthening Capabilities to Control Veterinary Drug Residues in Foodstuffs	D. H. Byron
ANG5003	Veterinary Drug Residue Monitoring Programme	D. H. Byron & A. Cannavan
ARG5011	The Use of Ionizing Radiation for the Phytosanitary Treatment of Fresh Fruit	T. Rubio Cabello
BEN5003	Veterinary Drug Residue Monitoring Programme	G. J. Viljoen (APHS), D. H. Byron & A. Cannavan
BEN5004	Regulatory Control and Monitoring of Mycotoxins to Facilitate Trade	J. Brodesser
BGD5024	Phytosanitary Treatment for Insect Pests Infesting Fresh Fruits and Vegetables	T. Rubio Cabello
BKF5005	Regulatory Control and Monitoring of Contaminants and Residues	J. Brodesser & B. Maestroni
BOL5015	Developing Pesticide Residue Monitoring Capabilities in Support of Cash Crops	I. G. Ferris
BOL5017	Capacity for Monitoring Pesticide Residues for Compliance with Minimum Risk Levels and Good Agricultural Practice According to ISO 17025	I. G. Ferris & B. Maestroni
BRA5058	Applying Ionizing Radiation for Food Security and Healthcare	T. Rubio Cabello
CHI5046	Certification of Exported Animal Products Using Nuclear and Other Analytical Techniques	D. H. Byron & A. Cannavan
CHI5048	Integrated Watershed Management for the Sustainability of Agricultural Lands	I. G. Ferris & L. Mabit (NAAL)
CMR5014	Creation of a Nuclear Analysis Laboratory in CATEN for Food Safety	J. Brodesser & I. G. Ferris
COL5021	Cost Benefit Assessment for the Modernization of an Irradiator in Colombia	T. Rubio Cabello
COL5022	Assessment of the Impact of Pesticide Use in Lake Tota, Boyacá, Colombia	I. G. Ferris
COS5026	Management and Appropriate Use of Insecticide-nematicides	I. G. Ferris
CPR5016	Strengthening the Quality Assurance System for Food Irradiation	T. Rubio Cabello
ERI5005	Zoonotic (diseases that can be transmitted from animals to humans) Disease Control and Analysis of Veterinary Residues in Foods	D. H. Byron & H. Unger (APHS)
GUA5015	Establishing a Food Irradiation Plant	T. Rubio Cabello
HAI5003	Enhancing Crop Productivity through the Application of Isotope Nuclear Techniques	L.K. Heng (SWMCN) & I. G. Ferris
INS5033	Enhancement of Quality Assurance for the Analysis of Veterinary Drug Residues	D. H. Byron & A. Cannavan
IVC5027	Monitoring of Pesticide Residues in Food Products	J. Brodesser & B. Maestroni
JAM5009	Developing Soil Fertility Management	L.K. Heng (SWMCN) & I. G. Ferris

Project Number	Title	Technical Officer
MAK5005	Upgrading of Food Safety System	J. Brodesser & B. M. Maestroni
MLI5018	Regulatory Control and Monitoring of Pesticides and Residues in Fresh Produce	J. Brodesser & T. Rubio Cabello
MNE8002	Upgrading a Persistent Organic Pollutant Laboratory towards Accreditation for Environmental Monitoring	A. Safrany (NAPC) & J. Brodesser
MOR5024	Industrial Application of Irradiation	T. Rubio Cabello
MOR5029	Conserving and Improving the Quality of Aromatic and Medicinal Plants through Irradiation, and Transfer of this Procedure on an Industrial Scale	T. Rubio Cabello & M.H. Sampa (NAPC)
NIC5007	Determining Drug Residues in Bovine Meat Exports	D. H. Byron, A. Cannavan & J. Brodesser
NIR5033	Improvement of Quality Management and Food Safety Monitoring Using Isotope Techniques	J. Brodesser & D. H. Byron
NIR5034	Feasibility Study on the Optimal Use of an Industrial Gamma Irradiation Facility	M.H. Sampa (NAPC) & T. Rubio Cabello
PAN5017	Monitoring Pesticide Residues in the Production of Tropical Fruit (Pineapples and Melons) and Controlling Analytical Quality with the Aid of Nuclear Techniques	I. G. Ferris & B. Maestroni
PHI5030	Upgrading the Gamma Irradiation Facility	M. H. Sampa, (NAPC), S. M. Haji-Saeid, (NAPC), T. Rubio Cabello
RAS5046	Novel Applications of Food Irradiation Technology for Improving Socioeconomic Development (RCA)	T. Rubio Cabello
RER9074	Long-Term Countermeasure Strategies and Monitoring of Human Exposure in Rural Areas Affected by the Chernobyl Accident	V. Berkovskyy (NSRW), I. G. Ferris, S. Fesenko (NAAL)
RLA5050	Strengthening Laboratory Capacity to Assess the Implementation of Good Agricultural Practices in the Production of Fruit and Vegetables in Latin America	B. Maestroni, I. G. Ferris & F. Zapata (SWMCN)
ROK5034	Nutrient Efficient Crops and Safe Use of Pesticides in Sustainable Crop Production	I. G. Ferris
SEN5027	Regulatory Control and Monitoring of Contaminants and Residues in Fresh Produce	D. H. Byron & J. Brodesser
SLO5002	Protecting Groundwater and Soil against Pollutants Using Nuclear Techniques	J. Adu-Gyamfi (NAAL) & I. G. Ferris
SRL8019	Technical Support for the Establishment and Operation of a Multi-Purpose Gamma Irradiation Facility	M.H. Sampa (NAPC) & T. Rubio Cabello
SYR5020	Implementation of Quality Assurance and Quality Control Procedures in Pesticide Residue Analysis Laboratories	J. Brodesser & D. H. Byron
URT5024	Nuclear Techniques for the Monitoring of the Food Quality in the United Republic of Tanzania	J. Brodesser

# FAO/IAEA Agriculture & Biotechnology Laboratory, Seibersdorf

## EU 6<sup>th</sup> Framework 'ProSafeBeef' Project Meeting; Vienna, Austria, 4 October 2007

Scientific Secretary: Andrew Cannavan

A meeting of the partners in work package 1.4, Chemical Residues, of the EU 6<sup>th</sup> Framework Integrated Project Advancing Beef Safety and Quality through Research and Innovation (ProSafeBeef) was held in Vienna International Centre on 4 October 2007. The meeting had eight participants representing all partners in the work package. Work plans were elaborated for the development and validation of analytical methods for anthelmintics in beef and the transfer of the methods to Seibersdorf and Brazil. Details were also elaborated for the sampling schedule and numbers for beef from the market in five European countries and Brazil for risk analysis. The next project meeting will take place in April 2008 in the University of Ghent, Belgium.

## Development and validation of an improved HPLC method for the control of potentially counterfeit isometamidium products

A paper on an analytical method developed and validated in a collaborative project between the Department of Pharmaceutical Sciences at the Strathclyde Institute for Biomedical Sciences, UK and the Agrochemicals Unit, titled Development and Validation of an Improved HPLC Method for the Control of Potentially Counterfeit Isometamidium Products, was accepted for publication in Journal of Pharmaceutical and Biomedical Analysis.

## Adaptation of a method for the analysis of 22 pesticides in water

Technical officer: Britt Maestroni

A method for the analysis of pesticides in water was modified from the published method, DIN 38407, 1993. A mixture of 22 pesticides having different physico-chemical properties was used in the preliminary method adaptation experiments.

The method comprises two extraction steps, applied in series: The first step employs a micro-separator device for the extraction of the less polar compounds with n-hexane (Fig. 1.), whilst the second step utilizes octade-

cyl extraction disks to recover compounds of medium polarity from the water phase.

Preliminary results for the characterization of the method were satisfactory, with recoveries for the 22 compounds tested ranging from about 78% to 107%, and with variability expressed as coefficients of variation, ranging from <1% to about 17%.

The combined extraction procedure is very fast and does not require sophisticated equipment, making it suitable for application in many Member States' laboratories. The method will be applied by researchers in ten countries participating in CRP D5.20.35 on Integrated Analytical Approaches to Assess Indicators of the Effectiveness of Pesticide Management Practices at a Catchment Scale.



Fig. 1. Microextractor device used in step 1 of the procedure.

## Simultaneous determination of organochlorine pesticides and polychlorinated biphenyls in fish tissue

Organochlorine pesticides, as well as various other chemicals, can be found as environmental pollutants in many parts of the world. These chemicals may be bio-accumulated by aquatic organisms. Fish and shellfish tissue monitoring serves as an important indicator of contaminated sediments and water quality problems. Tissue contaminant monitoring also enables responsible agencies to control the risk to human consumers that may be posed by the presence of these chemicals in edible fish and shellfish.

A simple and rapid method for the analysis of organochlorine pesticides in fish tissue was developed and validated in the Agrochemicals Unit. The method for fish tissue was adapted from a method previously validated in the Unit for pesticide residues in fruits and vegetables using ethyl acetate extraction, dispersive solid phase clean-up and gas chromatographic analysis with ECD and NPD detection. The method comprises fine-chopping of the fish sample, extraction with ethyl acetate at 30°C, clean up by dispersive solid-phase extraction and analysis by gas chromatography with ECD and NPD detection.

The method was initially validated for 12 organochlorine pesticides, and subsequently the validation was expanded to include the simultaneous analysis of 9 polychlorinated biphenyls. Two radiolabelled compounds,  $^{14}\text{C}$ -lindane and  $^{14}\text{C}$ -DDT, were used in the initial stages of method optimization and characterization. Average recoveries for all 21 compounds included in the validation ranged from 82-91%, with relative standard deviations <10%. Limits of detection (LOD) were less than 3 ppb for all analytes except dieldrin, which had a LOD of about 6 ppb.



Fig. 2. Sample preparation for the OC/PCB method



Fig. 3. Sample analysis for OC/PCBs

sults of the study performed by the Entomology Unit will be published elsewhere.

## Fellows and Interns

Mr. Jean Pierre Ouattara (BKF) completed a 4-month fellowship in August; and Ms. Hina Siddiqi (PAK) completed a 6-month internship in the Agrochemicals Unit in September. Mr. Ouattara and Ms. Siddiqi were both trained in, and worked on, various aspects of method validation, multiresidue pesticide residue methods (developed in-house), instrumental analysis, radio-tracer technique and laboratory QA. Their work contributed to the validation of an efficient method for the determination of organochlorine pesticides in edible fish by gas chromatography. Ms. Siddiqi also worked on the extension of the method to simultaneously determine organochlorine pesticides and polychlorinated biphenyls in fish tissue. This work will be written up and submitted for consideration for publication in a peer-reviewed scientific journal.

## Feed analysis

Analyst: Nasir Rathor

The Agrochemicals Unit collaborated with the Entomology Unit by providing analytical services for a study to investigate chlortetracycline levels in a medicated diet for medfly larval rearing over a period of time. The analytical method was adapted from the method of Houghum et al<sup>12</sup>. Briefly, homogenized sample was extracted with acetone: water: 1M HCl (12:6:2) at pH <1.2, the extract was centrifuged and a portion of the supernatant was diluted with 0.02M oxalic acid: acetonitrile (8:2) for analysis by reversed-phase HPLC with fluorescence detection. Typical recovery for the method was between 80-90%. The re-

<sup>12</sup> 1997, J.AOAC Int., Vol.80, Nr.5, pp.961-965



# Extending the use of the eLearning Platform

## Utilization of the Agency's eLearning and ACollab platform to host the Codex Electronic Working Group on Alternative Approaches on Measurement Uncertainty

Technical Officer: Josef Brodesser

The Agency's eLearning module and its ACollab tool were utilized to provide an electronic platform for the Codex Committee of Pesticide Residues (CCPR) Electronic Working Group on Alternative Approaches on Measurement Uncertainty (MU). Respective information can be uploaded/downloaded, forum contributions posted, etc. The platform is accessible under <http://elearning.iaea.org/ATutor/login.php>.

The respective CCPR Electronic Working Group was set-up following up the discussions held at the recent CCPR Meeting in Beijing in May 2007. Codex members interested in this topic have registered therein. The outcomes of the Working Group discussions are intended to be utilized for bringing forward the current

discussion and development on MU estimation. The background of it is that current practices for estimating MU currently are relying on a bottom-up calculation approach mostly which is difficult to handle. The special requirements of pesticide residue analysis in food imply that a huge diversity of combinations of pesticides and commodity matrices make it extremely difficult and time consuming to cover all.

Therefore, the intention of forming the Working Group was to investigate and broaden the applicability of top-down approaches on MU estimation. For instance, the use of Proficiency Testing results, together with individual laboratory validation data, would simplify the estimation of MU considerably. Individual MU ranges for each and every combination of pesticide/matrix could then be replaced by a generalized approach, e.g., of +/-25% relative standard deviation. Data and evidence to support such MU approaches currently are favored within the EU. It will be discussed at the next CCPR Meeting in China in April 2008, to be prepared by the Electronic Working Group.

## Publications

Schad, G.J., Allanson, A., Mackay, S.P., **Cannavan, A.** and Tettey, J.N.A. (2007). Development and validation of an improved HPLC method for the control of potentially counterfeit isometamidium products. *Journal of Pharmaceutical and Biomedical Analysis*, in press.

**Islam, M., Cannavan, A.** and **Schweikert Turcu, M.** (2007). Validation of a robust liquid chromatography – tandem mass spectrometry (LC-MSMS) confirmatory method for 13 sulphonamides. Book of abstracts of the 3<sup>rd</sup> International Symposium on Recent Advances in Food Analysis, 7-9 November 2007, Prague, Czech Republic, 170, 235.

**Aysal, P.** and **Cannavan, A.** (2007). The IAEA-ethyl acetate multiresidue method to determine pesticide residues in fruits and wheat flour. Book of abstracts of the SETAC Europe 17<sup>th</sup> Annual Meeting, Multiple stressors for the environment and human health - present and future challenges and perspectives, 20-24 May 2007, Porto, Portugal, 107.

Whitaker, T.B., Doko, M.B., **Maestroni, B.M.**, Slate, A.B. and Ogunbanwo, B.F. (2007). Evaluating the performance of sampling plans to detect fumonisin B1 in maize lots marketed in Nigeria. *Journal of AOAC International*, 90, 2007.

Fodey, T., Murilla, G., **Cannavan, A.** and Elliott, C. (2007). Characterisation of antibodies to chloramphenicol produced in different species by ELISA and biosensor technologies. *Analytica Chimica Acta*, 592, 51-57.

**Aysal, P.**, Ambrus, Á., Lehotay, S.J. and **Cannavan, A.** (2007). Validation of an efficient method for the determination of pesticide residues in fruits and vegetables using ethyl acetate for extraction. *Journal of Environmental Science and Health B*, 42, 481-490.

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**Cannavan, A.** (2007). Developing country regulatory concerns and collaborative work to protect consumers and facilitate international trade. Book of abstracts of the Saskatoon International Workshop on Validation and Regulatory Analysis, 10-13 June 2007, Saskatoon, Canada, 17.

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**Maestroni, B.M., Rathor, M.N. and Cannavan, A.** (2007). A simple, economical and efficient sample

processing procedure for fumonisin B1 analysis in maize. Book of abstracts of the XII<sup>th</sup> International IU-PAC Symposium on Mycotoxins and Phycotoxins, 21-25 May 2007, Istanbul, Turkey, 1474.





**IAEA**

International Atomic Energy Agency

## Food and Environmental Protection

Newsletter Vol. 11, No. 1

January 2008

The FEP Newsletter is prepared twice per year by the Food and Environmental Protection Section, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture and FAO/IAEA Agriculture and Biotechnology Laboratory, Seibersdorf.

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Wagramer Strasse 5, P.O. Box 100,  
A-1400 Vienna, Austria

Printed by the IAEA in Austria,  
January 2008

07-50991