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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

WORLD HEALTH ORGANIZATION

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME
CODEX ALIMENTARIUS COMMISSION

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REPORT ON ACTIVITIES OF THE INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA) RELEVANT TO CODEX WORK[1]

1. Since 1964, the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture has been in a unique position to promote the mandates of both FAO, in its efforts to eliminate world hunger and poverty through sustainable agricultural development, improved nutrition and food security, and the IAEA, through peaceful uses of atomic energy to accelerate and expand the contributions of nuclear technologies to health and prosperity worldwide.

2. The mission of the Joint FAO/IAEA Programme on Nuclear Techniques in Food and Agriculture is to strengthen capacities for the use of nuclear methods to improve technologies for sustainable food security and to disseminate these techniques through international activities in research, training and outreach in its Member States. The Joint FAO/IAEA Programme is subdivided into four major subprogrammes on sustainable intensification of crop production systems, sustainable intensification of livestock production systems, sustainable control of major insect pests and improving food and environmental safety. The FAO/IAEA Agriculture and Biotechnology Laboratory (Seibersdorf) and the IAEA Marine Environment Laboratory (Monaco) play a key role in supporting the Joint FAO/IAEA Programme.

3. The Food and Environmental Protection Section of the Joint FAO/IAEA Division and the Agrochemicals Unit of the FAO/IAEA Agriculture and Biotechnology Laboratory implements the food and environmental safety subprogramme that provides assistance in four main areas, namely, coordinating and supporting research, providing technical and advisory services, providing laboratory support and training, and collecting, analyzing and disseminating information, primarily in areas related to the use of ionizing radiation, pesticide and veterinary drug residues, and radioactive contamination of foodstuffs. Highlights of some of the subprogramme activities are as follows:

Coordinated Research Project on Applications of Radiotracer and Radioassay Technologies to Seafood Safety Risk Analysis

4. Representatives of the IAEA attended the recently held 2nd Session of the Codex Committee on Contaminants in Foods (CCCF) to report on activities of interest arising from the IAEA Department of Nuclear Sciences and Applications. In particular, it was reported that the IAEA had initiated a Coordinated Research Project (CRP) on Applications of Radiotracer and Radioassay Technologies to Seafood Safety Risk Analysis (see CX/CF 08/2/3 - Add. 1). It is envisioned that this research could lead to the potential establishment of maximum levels in seafood for those contaminants already evaluated (lead, cadmium) by

[1] Document prepared by and under responsibility of IAEA.

the Joint FAO/WHO Expert Committee on Food Additives (JECFA) as well as contaminants not evaluated to date (harmful algal blooms, persistent organic pollutants and other toxins) through the Joint FAO/WHO Codex Alimentarius Commission.

5. The reporting officers noted that the CRP brought together research laboratories with the required capabilities that, as members of wider groups, have an objective 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. Immediate benefits to individual groups include assistance from the IAEA to improve laboratory competence for the specific requirements of the project and the opportunity to interact with groups working on comparable problems in different environments. CRP participants included Brazil, Canada, Chile, China, France, French Polynesia, Ghana, Japan, Pakistan, the Philippines, Vietnam and a representative of the World Health Organization (WHO).

6. The CCCF was informed that specific research would:

- Focus on cadmium in oysters, scallops and cephalopods, including natural background contamination and considering exposures related to specific edible tissues.
- Focus on harmful algal bloom paralytic shellfish poisoning toxin (PSP) and ciguatoxin fish poisoning (CFP), including the application of monitoring programmes and radiotracer technologies.
- Apply radiotracer and radio-assay techniques and use IAEA marine reference materials for quality assurance purposes, including the establishment of baseline data.
- Conduct risk assessments based on specific aquaculture and/or marine species, including the consideration of their geographical location and taking account of the bioaccumulation characteristics of different species and habitats.
- Conduct risk assessments on the cellular speciation and bioavailability (including in vitro) of contaminants in specific edible seafood tissues traded internationally and intended for human consumption.
- Conduct risk assessments through various food, sediment and water interfaces, including consideration of contaminant concentrations in these sources.

7. In discussing the CRP proposal, the Committee was reminded that it had previously concluded that the establishment of maximum levels for cadmium in oysters and scallops was unnecessary due to their low contribution to overall human exposure. However, it was noted that the new data generated by the CRP could be considered when available for the potential elaboration of maximum levels for cadmium in these commodities.

8. The second research coordination meeting of the CRP will be hosted by the International Centre for Theoretical Physics (ICTP) in Trieste, Italy, from 8-12 December 2008.

Methods of Analysis and Sampling for Pesticide Residues

9. A representative of the IAEA participated at the 40th Session of the Codex Committee on Pesticide Residues (CCPR) and chaired the CCPR *ad hoc* Working Group on Methods of Analysis and Sampling. Among other issues, the representative introduced the IAEA prepared Discussion Papers on the Estimation of Uncertainty of Results for the Determination of Pesticide Residues (CX/PR 08/40/5) and on Procedures for the Separation of Milk Fat From Whole Milk (CX/PR 08/40/6).

10. In this regard, the CCPR proposed the revision of the Guidelines on the Estimation of Uncertainty of Results (CAC/GL 59-2006) for approval as new work by the 31st Session of the Codex Alimentarius Commission. The CCPR further agreed that an electronic working group coordinated by the IAEA would prepare a proposed draft revision to the Guidelines in order to provide practically oriented recommendations, including examples on the estimation of measurement uncertainty and the application of the concept in pesticide residue analysis, so as to better facilitate the understanding of the estimation of measurement uncertainty by pesticide residue testing laboratories.

11. The IAEA looks forward to the continued consideration of issues related to methods of analysis and sampling for pesticide residues through the Codex Committee on Pesticide Residues, including the Chairmanship of the *ad hoc* Working Group on Methods of Analysis and Sampling.

Training Workshop on an Introduction to Quality Assurance/Quality Control Measures in Pesticide Residue Analytical Laboratories

12. The presence of pesticide residues in food and the environment may affect human health and create barriers to trade in agricultural commodities. The control of pesticide residues is achieved through the application of good agricultural practices (GAP). Analytical laboratories play an integral role in the application of GAP through verification not only of the input quality, but also of the output quality of the agricultural commodity. Laboratories may also provide information and advice to farmers and producers, either directly or through extension services. Current international agreements require that the pesticide residue content of commodities moving in international trade is certified by laboratories implementing appropriate quality control and quality assurance systems. In order to produce internationally acceptable results, laboratory staff must be familiar with the principles of ISO Standard 17025 and Good Laboratory Practice (GLP). This requires intensive practical and theoretical training.

13. In response to these Member States needs, the FAO/IAEA Training and Reference Centre for Food and Pesticide Control will hold a Training Workshop on the Introduction to Quality Assurance/Quality Control Measures in Pesticide Residue Analytical Laboratories at the FAO/IAEA Agriculture and Biotechnology Laboratory in Seibersdorf, Austria, from 6 – 31 October 2008.

14. The objectives of the Workshop are to introduce and elaborate the QA/QC principles relevant to pesticide residue analysis according to ISO Standard 17025 and GLP Guidelines, and to discuss the various possible roles of quality assured laboratories in the application and monitoring of the effectiveness of GAP.

15. The course is open to analysts from Member Countries of FAO or IAEA. The analysts should come from laboratories authorized by Governments to perform analyses for the official control of pesticide residues in food commodities, thereby facilitating international trade and the provision of safe food supplies at the national level. Further information will be posted on the Food and Environmental Protection website at http://www-naweb.iaea.org/nafa/fep/index.html.

Coordinated Research Project on the Use of Irradiation to Ensure the Safety and Quality of Prepared Meals

16. The overall objective of the Coordinated Research Project (CRP) on the Use of Irradiation to Ensure the Safety and Quality of Prepared Meals was to evaluate the effectiveness of irradiation as a method to ensure the microbiological safety and extend the shelf-life of prepared meals, stored under ambient, chilled or frozen conditions, and to evaluate the sensory quality of the treated products. The specific objective was to use validated procedures for irradiation treatment and process control, and to use validated methods for assessing microbiological safety and quality as well as the sensory evaluation of prepared meals, mainly of ethnic origin.

17. The CRP demonstrated that radiation processing of prepared meals resulted in safer food by eliminating pathogens and extended the shelf-life by decreasing the number of spoilage organisms without significantly jeopardising the overall quality. The safety of radiation processed products was demonstrated using challenge tests/inoculated pack studies with various pathogenic test organisms or their surrogates. The project also confirmed the results of consumer studies that the provision of information about the nature of food irradiation increases consumer acceptance and the willingness to pay a premium for enhanced product safety and quality. Radiation treatment thereby offers the opportunity for a wider utilisation and marketing of such high quality meals, including many ethnic food products.

18. Although the CRP demonstrated that radiation processing can facilitate the production of safer and extended shelf-life products, the work also highlighted the complexity and technological challenges of using radiation processing for multi-component food systems such as prepared meals. In view of the insight

gained regarding the quality changes that occur in the irradiated foods investigated, further research activities were recommended.

19. The CRP results will be published in 2008 as an IAEA non-serial in-house publication. Further information will be posted on the Food and Environmental Protection website at http://www-naweb.iaea.org/nafa/fep/index.html.

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