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Food and Agriculture Organization of the United Nations

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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. For almost 50 years, the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture (Joint Division) has uniquely promoted the mandates of both FAO, in its efforts to eliminate world hunger and reduce poverty through sustainable agricultural and rural 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 promote global health and prosperity. Following the major reform process at FAO, this partnership has been further strengthened and has confirmed the strong support of both FAO and IAEA Member States.

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 improving food and environmental safety, sustainable intensification of crop production systems, sustainable intensification of livestock production systems and sustainable control of major insect pests.

3. The Food and Environmental Protection Section (Vienna) and the newly named Food and Environmental Protection Laboratory of the Agriculture and Biotechnology Laboratory (Seibersdorf) implements the Food and Environmental Protection Subprogramme. The Subprogramme will continue to strengthen our joint efforts with FAO to protect human health and facilitate international agricultural trade by providing 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. These activities are primarily related to the use of ionizing radiation, the control of food contaminants, including pesticide and veterinary drug residues, and the management of nuclear and radiological emergencies affecting food and agriculture.

4. Highlights of some Food and Environmental Protection Subprogramme activities are as follows:

IAEA VACANCY ANNOUNCEMENT – FOOD SAFETY SPECIALIST POSITION

5. Qualified candidates are encouraged to apply[2] to our recently announced new Food Safety Specialist (Traceability) position (Vacancy Notice 2010/061) at the Food and Environmental Protection Laboratory in Seibersdorf, Austria. It is envisioned that the selected candidate will assist us in our efforts to respond to Member State priorities in the application of nuclear technologies to meet their food security goals related to the traceability and authenticity of food commodities within the general context of improving food quality and safety and enhancing international trade in foods.

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

[2] http://recruitment.iaea.org/phf/p_vacancies.asp

NEW COORDINATED RESEARCH PROJECTS

6. The IAEA encourages and assists the development and practical application of research on uses of nuclear techniques to foster the exchange of scientific and technical information. IAEA coordinated research activities are designed to stimulate and coordinate the undertaking of research by scientists in IAEA Member States in selected nuclear fields. These coordinated research activities are normally implemented through Coordinated Research Projects (CRP) that join together research institutes in both developing and developed Member States to collaborate on the research topic of interest. The research that is supported encourages the acquisition and dissemination of new knowledge and technology generated through the use of nuclear technologies and isotopic techniques in the various fields of work covered by both the FAO and IAEA mandates.

Coordinated Research Project on the Implementation of Nuclear Techniques to Improve Food Traceability

7. Producing safe and high quality food is a prerequisite to ensure consumer health and successful domestic and international trade, and is critical to the sustainable development of national agricultural resources. Traceability systems play a key role in assuring food safety. Analytical techniques that enable the provenance of food to be determined provide an independent means of verifying "paper" traceability systems and also help to prove authenticity, to combat fraudulent practices, and to control adulteration, which are important issues for economic, religious or cultural reasons.

8. In this regard, we are pleased to report that a new CRP on the *Implementation of Nuclear Techniques to Improve Food Traceability* has recently been approved on the basis of a project proposal developed by a consultants meeting held in Vienna in March 2010. It is anticipated that the project will commence in early 2011 and qualified applicants are encouraged to apply to participate in the project by 30 September 2010.[3]

9. The project will address some of the challenges that developing countries are facing in ensuring food traceability. In particular, it will help laboratories in Member States to establish robust analytical techniques to determine provenance of food through the assessment of the isotopic and elemental composition of foodstuffs using an integrated and multidisciplinary approach. The immediate benefit to laboratories will be the implementation and application of state-of-the-art nuclear measurement techniques to determine the provenance of foodstuffs. Fraud involving the redirection of consignments contaminated with veterinary drug residues is also an area of concern, e.g. honey and shrimp containing residues of prohibited antibiotics. Techniques developed in the project will complement analytical methods to detect residues and contaminants in foods within holistic food safety systems.

Coordinated Research Project on the Development of Irradiated Foods for Immuno-compromised Patients and Other Potential Target Groups

10. Although irradiation has been employed in the past to sterilize foods for patients, very few foods are currently irradiated specifically for this purpose and the technology is not utilised in most countries. Recent projects and published papers indicate that low dose treatments (irradiation without complete sterilization) can be used to provide foods that are suitable for hospital diets, and the generated data indicated that the foods nutritional quality was not severely affected and had favourable organoleptic qualities, resulting in an increase in the range of foods available for the immuno-compromised.

11. In this regard, we are pleased to report that our new CRP on *Irradiated Foods for Immunocompromised Patients and other Potential Target Groups* has recently been approved on the basis of a project proposal developed by a consultants meeting held in Vienna in November 2009. It is anticipated that the first research coordination meeting will be held in Vienna from 23-27 August 2010.

12. The project will address the application of food irradiation to increase the range and variety of foods available for those with impaired immune systems (e.g. neutropenic[4] patients) or patients who require other special foods, e.g. blended (nasogastric) hospital diets. Research will be conducted on the application of irradiation alone or in combination with other food technologies at different locations. Researchers will use practices required for sanitary applications of food irradiation to meet requirements applicable to food for

[3] http://www-crp.iaea.org/html/rifa-show-approvedcrp.asp

[4] Nutropenia is a blood disorder characterized by an abnormally low number of white blood cells and other neutrophils that defend the body against bacterial infections.

patients with compromised immunity. Acceptability will be evaluated in terms of both quantitative (microbiological safety, nutritional and organoleptic properties) and qualitative factors (psychological well-being, quality of life). It is envisioned that the project will involve the collaboration of food scientists, medical professionals and nutritionists. Standardised procedures will be developed, including quality assured handling and packaging procedures, accurate and traceable dosimetry and precisely defined assurance levels for microbiological acceptability.

ONGOING COORDINATED RESEARCH PROJECTS

Coordinated Research Project on the Development of Radiometric and Allied Analytical Methods to Strengthen National Residue Control Programs for Antibiotic and Anthelmintic Veterinary Drug Residues

13. The recently commenced CRP on the *Development of Radiometric and Allied Analytical Methods to Strengthen National Residue Control Programs for Antibiotic and Anthelmintic Veterinary Drug Residues* held its first Research Coordination Meeting at IAEA Headquarters in Vienna, Austria, from 19-23 October 2009. The meeting was attended by participants from Brazil, China, Kenya, Korea, Mongolia, Peru, Sri Lanka, Thailand and Tunisia. Experts from Austria, Belgium, Germany, the Netherlands, the United Kingdom and the United States also provided scientific and technical support to the participants.

14. The main purpose of the project is to assist National Reference Laboratories of FAO and IAEA Member States in meeting the need for effective and appropriate monitoring methods for residues of selected antibiotic and anthelmintic veterinary medicines through the development and application of screening methods that exploit the advantages (robustness, sensitivity, transferability) of radiotracer detection methods, in conjunction with confirmatory techniques using stable-isotope labelled molecules. The project is also investigating sources of natural antimicrobial compounds likely to impact the regulatory framework for veterinary drug residues and in this respect, the natural occurrence of the prohibited antibiotic chloramphenicol in plant material has already been demonstrated.

15. This project forms a unique and global network of scientific expertise addressing complex and important food safety challenges and its successful implementation will result in improved food and feed quality and safety in FAO/IAEA Member States and further help developing countries to access major global food markets. Research results from the participants will assist regulators in the development of new guidelines and regulations pertaining to food safety and the environmental impact of veterinary drugs. All the methods developed and validated by the project will be made available through publications and on the Food and Environmental Protection Subprogramme web pages.

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

16. The ongoing CRP on *Applications of Radiotracer and Radioassay Technologies to Seafood Safety Risk Analysis* held its third Research Coordination Meeting at IAEA Headquarters in Vienna, Austria, from 1-5 February 2010. The meeting was attended by participants from Brazil, Chile, Pakistan, the Philippines, Thailand and Vietnam. Experts from Canada, China, France, French Polynesia and Japan also provided scientific and technical support to the participants.

17. The IAEA looks forward to the conclusions of the 73rd Meeting of JECFA related to the submission of research data arising from project participants (Canada, Chile, China, Japan, Thailand and Vietnam) for the potential establishment of maximum levels for cadmium in seafood (oysters, scallops and cephalopods) through the Codex Alimentarius Commission.

QUALITY CONTROL OF TRYPANOCIDAL DRUGS

18. African trypanosomiasis is a severe disease which is fatal if left untreated. The conventional and most common method to combat trypanosomiasis is by chemotherapy. It is known that there is widespread marketing and use of counterfeit and poor quality isometamidium and diminazene based trypanocidal drugs in sub-Saharan Africa. This has severe implications for both animal health and food safety, posing problems with residues of unspecified, unwanted chemicals and their metabolites in the food chain and the induction of trypanosome resistance, an already widespread phenomenon.

19. The Animal Health Service of the FAO and the International Federation for Animal Health (IFAH) signed in July 2008 a Memorandum of Understanding to address these issues. The FAO Animal Health Service, in partnership with the Joint FAO/IAEA Division and IFAH, cooperate to develop standards and protocols for quality control/quality assurance for trypanocidal drugs and other classes of veterinary drugs, including insecticides, acaricides, anthelmintics and antibiotics. The United Nations Industrial Development Organisation (UNIDO), the United Nations Office of Drugs and Crime (UNODC) and Strathclyde University are also associated with this initiative.

20. The purpose of the project is to provide validated protocols for drug quality control to the relevant regulatory bodies in countries where these drugs are used, and also to transfer the technological knowledge to sub-Saharan African laboratories. The establishment of standards and protocols for drug quality assessment will allow pharmaceutical companies and laboratories, including local/small companies in African and in other developing countries throughout the world, to market and compete on an equal basis following internationally agreed quality control/quality assurance protocols.

21. The FAO/IAEA Food and Environmental Protection Laboratory is currently collaborating with Strathclyde University in the development and validation of standard methods for the quality control of isometamidium, diminazene and homidium formulations and the elaboration of monographs for the available authentic formulations and the pure compounds. The quality control methods will be transferred to reference laboratories in Africa in a future phase of the project.

METHODS OF ANALYSIS FOR RESIDUES OF PESTICIDES AND VETERINARY DRUGS

22. Access to analytical methods continues to be a problem in many developing country Member States, especially in the form of validated method protocols. To help address this problem, the Food and Environmental Protection Subprogramme has collaborated with the Codex Committee on Pesticide Residues in publishing analytical methods made available by National Authorities on its web pages. To date, pesticide residue methods have been made available by Canada, Germany, the Netherlands, the United States and others.[5]

23. In regard to methods of analysis for veterinary drug residues in foods, the Joint Division will also include analytical methods for veterinary drug residues developed through the activities of the Food and Environmental Protection Subprogramme on its web pages. We are of the opinion that methods, including full protocols of validated methods or links to method protocols, could enhance the capabilities of developing countries to identify and implement suitable methods in support of residue monitoring plans.

FAO AND IAEA TECHNICAL COOPERATION PROJECTS

24. The Food and Environmental Protection Subprogramme is responsible for providing scientific and technical support for over 40 national and regional FAO and IAEA Technical Cooperation (TC) Projects in the areas of pesticide and veterinary drug residues, mycotoxins and food irradiation. These projects provide recipient countries with equipment, expert advice and training, and are financed by both the FAO and IAEA Technical Cooperation Programmes and through trust funds provided by donor countries and international funding agencies.

[5] Please see http://www-naweb.iaea.org/nafa/fep/News-Main-page.pdf for details.