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***Applications of Radiotracer and
Radioassay Technologies to Seafood
Safety Risk Analysis***

REPORT OF THE CONSULTANTS MEETING

Monaco, 25-27 September 2006

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Vienna, Austria, 2006

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**MARINE ENVIRONMENT LABORATORIES
MONACO**

INTERNATIONAL ATOMIC ENERGY AGENCY

Report of the Consultants Meeting

On

**Applications of Radiotracer and Radioassay
Technologies to Seafood Safety Risk Analysis**

Monaco, 25-27 September 2006

Working Material Produced by the IAEA
Vienna, Austria, 2006

Introduction

The Consultants Meeting on Applications of Radiotracer and Radioassay Technologies to Seafood Safety Risk Analysis met at the IAEA Marine Environment Laboratories in Monaco from 25-27 September 2006.

Radiotracer and radioassay nuclear techniques are particularly useful for generating information on the biokinetics and food-chain transfer of metals and toxins in marine organisms, including those that are valued as seafoods. The results of these studies could be better linked to analyses that support risk-based management decisions with respect to the safety assessment of commercially important seafoods intended for human consumption.

A major objective of the CRP is to better integrate current studies on the applications of nuclear techniques to the study of the bioaccumulation and food chain transfer in seafoods, with risk management decisions in relation to the assessment of their suitability for human consumption.

Intent of the Project

This CRP will bring together research laboratories with the required capabilities that, as members of wider groups, have a focus, or intention, to apply radioassay and radiotracer techniques to evaluate and generate information on the biokinetics and food-chain transfer of metals and toxins in marine organisms, especially those that are valued as seafoods. Immediate benefits to individual groups include assistance from IAEA/FAO 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.

Objectives of Meeting

The broad objective of the CRP is 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 seafoods. The objective of the meeting was to review, revise and produce recommendations on the CRP proposal, as follows:

- ◆ The integration of current studies on the applications of nuclear techniques to the study of the bioaccumulation and food-chain transfer of contaminants in seafoods, with risk management decisions in relation to assessment of their suitability for human consumption and trade;
- ◆ To more clearly identify the needs for scientific data on the bioaccumulation of priority contaminants in seafoods through linkages with international standardisation bodies
- ◆ To generate data that are relevant to the management of contaminants in seafoods through the application of radiotracer, radioassay and related nuclear technologies.
- ◆ To prepare a list of laboratories/countries/experts in the different analytical areas (geographical and institutional representation) as potential participants in the CRP as agreement holders, research contract holders or technical contract holders.

The Meeting, chaired by D. Byron and R. Jeffree, discussed the above objectives in detail, made the following recommendations, and provided additional information on specific topics.

The List of Participants is attached to this report.

Presentations and Discussions

The Provisional Agenda for the meeting was adopted as proposed (see attached). Among the topics of discussion, presentations were made as to the ways and means to facilitate the further consideration of the CRP results within international standardization (Codex Alimentarius Commission) and expert (Joint FAO/WHO Expert Committee on Food Additives – JECFA) bodies. This included the potential establishment of maximum levels through Codex for contaminants already evaluated by JECFA (lead, cadmium) as well as contaminants not evaluated to date (HAB and other toxins, e.g. certain POPS). It was noted that this initiative would be undertaken on the basis of the presentations made, including international organization guidelines and procedures.

The science-based presentations highlighted the value of the applications of radioassay and radiotracer techniques to the study of the bioaccumulation and food-chain transfer of contaminants in seafoods, and the use of these data to underpin better exposure assessments as part of the risk analysis of contaminants in seafoods. The importance of selecting technically competent laboratories and contract holders from developing countries was stressed and in this regard, the consultants proposed potential CRP participants and laboratories (see attached).

The Consultants agreed on the need to select and focus on specific contaminant/seafood combinations for those high value commodities encountering barriers to international trade. It was noted that this decision was based on the evidence that particular species bioaccumulate certain contaminants to very high levels.

Recommendations

Based on the scope of the CRP and the activities needed to attain the CRP objectives

1. Individual contract and agreement holders should:
 - focus on one contaminant category (algal toxins or toxic metals) representative of a major seafood commodity to make observations and measurements with respect to:
 - harmful algal bloom paralytic shellfish poisoning toxin (PSP) and ciguatoxin (CPF).
 - Cadmium in oysters, scallops and cephalopods
 - Apply radiotracer and radio-assay techniques and use IAEA marine reference materials for quality assurance purposes.
 - Undertake activities to directly support laboratories in the implementation of the CRP
 - Generate data on the basis of the Global Environment Monitoring System / Food Contamination Monitoring and Assessment Programme (GEMS/Food).
 - Take account of Codex Risk Analysis Principles and Policy for Exposure Assessment of Contaminants and Toxins in Foods or Food Groups applied by the Codex Committee on Contaminants in Foods (www.codexalimentarius.net)
2. the IAEA should:
 - Establish and maintain a protected website for interaction among collaborators and provision of training materials and information.
 - Include training sessions and explore possibilities of additional training opportunities through the TC programme.

3. Participating laboratories should have several of the following:

- adequate funds for relevant research activities
- a laboratory quality system in place (preferably according to ISO/IEC 17025)
- receptor binding assay facility for algal toxins and/or radiotracer techniques and associated technologies
- internet access and capability/willingness to conduct training
- ongoing research programmes in the bioaccumulation of contaminants in marine organisms that are relevant to the following:
 - fisheries closures/re-openings;
 - specific aquaculture species and the geographical location of aquaculture facilities, based on bioaccumulation characteristics of species and habitats;
 - risk-based assessments of contaminants in seafoods;
 - bioavailability of contaminants in edible seafood tissues to human consumers; and
 - other gaps in knowledge of contaminant bioaccumulation.

Specific Related Tasks

Preparation of a list of laboratories/countries/experts in the different analytical areas, while taking geographical and institutional representation into account, as potential participants in the CRP as agreement holders, research contract holders or technical contract holders (see attached).

Issues Identified

The Consultants

1. identified the need for IAEA to provide marine reference materials for analytical quality assurance purposes in the measurement of toxic metals.
2. considered that IAEA and FAO should facilitate the participation of contract holders in existing training opportunities through provision of information and active support of training applications through the TC programme.

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List of potential CRP contract or agreement holders

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**Expert Consultants' Meeting on Coordinated Research Project:
Applications of Radiotracer and Radioassay Technologies to Seafood Safety
Assessment**

Final agenda

**IAEA Marine Environment Laboratories, Monaco
25-27 September 2006**

Monday, 25 Sept.	Activity	Speaker
9.00-9.30	Welcome speech by Director	Director, MEL
9.30-9.45	Adoption of the agenda, election of Chair	R. Jeffree, D. Byron
9.45-10.00	Objectives of the CRP	R. Jeffree, D. Byron
10.00-10.30	Radioassay and Radiotracer Techniques in Saxitoxin Uptake in Mussel	E. Sombrito
10.30-11.00	Coffee break	
11.00-11.30	Current/future status of <i>Codex Alimentarius</i> norms related to risk analysis, seafoods and seafood safety	D. Byron
1130-1200	Developing radio tracer techniques for the safety assessment of pollutants in the Asian coastal ecosystems	Y. Tateda
1200-1330	Lunch	
1330-1400	Metal bioaccumulation in marine organisms: levels, speciation and implications for safety	P. Bustamante
1400-1430	Food safety issues associated with products from aquaculture	G. Moy
1430-1500	HABS, receptor binding technique and applications to seafood safety assessment	F. Boisson
1500-1530	Metals in seafoods, bioavailability and digestion studies	M. Warnau
1530-1600	Coffee break	

1600-1630	Marine reference materials and quality-assured measurements of contaminants in marine biota	J.P. Villeneuve
1630-1700	Case study: establishment of quality – assured baseline concentrations of metal contaminants in priority seafoods from SE Asian coastal waters	R. Jeffree
1700-1815	Group discussion: the CRP proposal, its framework, in relation to issues raised in presentations ***	All participants

Tuesday, 26 Sept.	Activity	Speaker
9.00-9.30	Review of issues raised in relation to previous presentations	All participants
9.30-10.30	Discussions and formulation of recommendations	All participants
10.30-11.00	Coffee break	
11.00-12.00	Discussions and formulation of recommendations	All participants
12.00-13.30	Lunch	
13.30-15.30	Discussions and formulation of recommendations	All participants
15.30-16.00	Coffee break	
16.00-17.30	Discussions and formulation of recommendations ***	All participants

Wednesday, 27 Sept.	Activity	Speaker
9.00-10.30	Review and final agreement on recommendations	All participants
10.30-11.00	Coffee break	
11.00-12.00	Review and final agreement on recommendations	All participants

1200-1330

Lunch

1330-1600

Write- up of report

All participants

1600

Close of meeting

Chair and Director,
MEL
