CODEX ALIMENTARIUS COMMISSION

Food and Agriculture Organization of the United Nations

World Health Organization

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON CONTAMINANTS IN FOODS

Eleventh Session
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MATTERS OF INTEREST ARISING FROM OTHER INTERNATIONAL ORGANIZATIONS

This document contains information on IAEA and OECD work relevant to CCCF activities

PART I: ACTIVITIES OF THE JOINT FAO/IAEA DIVISION OF NUCLEAR TECHNIQUES IN FOOD AND AGRICULTURE

(Prepared by the Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture[1])

1. The Joint Food and Agriculture Organization of the United Nations (FAO) and International Atomic Energy Agency (IAEA) Division of Nuclear Techniques in Food and Agriculture (the "Joint FAO/IAEA Division") supports and implements activities related to improvement of food safety and control systems. Its activities are therefore closely related to the standards of Codex Alimentarius and its committees, including the Codex Committee on Contaminants in Foods (CCCF). Through its Food and Environmental Protection Section and Laboratory, it assists Member Countries of both FAO and IAEA in the peaceful application of nuclear techniques and related technologies. Activities of interest to the CCCF include the analysis and control of various chemical residues and food contaminants; food traceability and authenticity; food related radiation safety standards; preparedness and response to nuclear and radiological emergencies affecting food and agriculture, and; food irradiation. These are provided within the broad context of coordinating and supporting research worldwide; providing technical and advisory services for projects and training activities; providing applied research, laboratory support and training through the FAO/IAEA Agriculture and Biotechnology Laboratory situated at Seibersdorf, Austria; and collecting, analysing and disseminating information for the effective transfer of skills and technology. The Joint FAO/IAEA Division also provides technical support for national, regional and inter-regional development work through Technical Cooperation projects.

Technical Guidance on Radionuclides in Food and Drinking Water

2. In its report to this Committee in 2016, the Joint FAO/IAEA Division mentioned the importance of a new technical document (IAEA-TECDOC-1788) on Criteria for Radionuclide Activity Concentrations for Food and Drinking Water. In the light of the considerable interest expressed by CCCF10 delegates, a side event will be held on Monday lunchtime at CCCF11. The subject is Radionuclides In Food: Standards, New National Guidance and Recent Developments. The presenters are experts from international organizations; the IAEA, the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD) and the Joint FAO/IAEA Division.

3. TECDOC-1788 was published by the IAEA after CCCF-10 and copies are available at this meeting, it is also freely available online[2]. Prepared by the IAEA, FAO and the World Health Organization (WHO), TECDOC-1788 is important as a reference source and as technical guidance. It is an authoritative reference to the different international standards that relate to radionuclides in food and drinking water, and this includes the guideline levels in the Codex General Standard for Contaminants and Toxins in Food and Feed (CODEX STAN 193-1995). For completeness, the TECDOC also summarizes current international standards for radionuclides in food, milk and drinking water in "emergency exposure situations" issued by the IAEA in joint sponsorship with international organizations including FAO and WHO[3].

[1] https://www.iaea.org/topics/food-and-agriculture
[2] http://www-pub.iaea.org/MTCD/publications/PDF/TE-1788_web.pdf
[3] IAEA Safety Standards Series No. GSR Part 7 (2015) and No. GSG-2 (2011)

4. This TECDOC highlights and discusses the circumstances in which such standards are intended to be used. However, its main focus is "existing exposure situations" and in this regard the TECDOC provides technical guidance to help authorities develop activity concentration levels (becquerel per kilogram) for use as practical reference levels. It advocates the same approach as CODEX STAN 193-1995 and relates to International Basic Safety Standards (IBSS)[4] that require regulatory bodies or other relevant authorities to establish specific reference levels for exposure due to radionuclides in food. Such reference levels should be based on an annual effective dose to the representative person that generally does not exceed a value of about 1 mSv. The TECDOC will therefore help countries develop national radionuclide reference levels that are required by the IBSS and are consistent with the Codex guideline levels for radionuclides in food.

Technical Workshop on the Remediation of Radioactive Contamination in Agriculture, IAEA Headquarters, Vienna, Austria, 17–18 October 2016

5. The National Agriculture and Food Research Organization of Japan and the Joint FAO/IAEA Division hosted this international technical workshop on Remediation of Radioactive Contamination in Agriculture and the presentations are available on-line[5]. It was attended by over 100 participants and served to improve understanding of radioactive contamination in agriculture. Authorities and organizations with responsibilities for food and agriculture were targeted, as were nuclear safety institutions and organizations. It provided an opportunity to forge collaborative working to facilitate future policy development and research planning. There have been few major nuclear accidents that have affected agricultural production in the long term. However, the year 2016 marked the fifth anniversary of the accident at the Fukushima Daiichi nuclear power plant (NPP) and the 30th anniversary of the accident at the Chernobyl NPP. Both classified as major accidents at Level 7, the highest on the IAEA's International Nuclear and Radiological Event Scale. The major focus of the workshop was therefore on residual levels of caesium radionuclides in countries affected by these accidents. Emergency preparedness related to food and agricultural production in all countries will be greatly improved by a broad understanding in this area. The workshop also helped to inform technical specialists and support collaborations and efforts to re-establish agricultural trade in food products from areas currently affected by residual levels of caesium radionuclides.

Technical Cooperation

6. The Joint FAO/IAEA Division is providing technical support to 59 IAEA Technical Cooperation Projects in the area of food safety and control[6]: 47 are national projects, 11 are regional and one is an inter-regional project to establish a world-wide network of analytical and control laboratories. Looking forward to the 2018-19 biennium, there are some 30 new project designs that are being developed and reviewed and we hope to provide more information on these at the next CCCF in 2018.

Coordinated Research Initiatives

7. In the period covered by this report the Joint FAO/IAEA Division has been implementing seven coordinated research projects (CRPs) in the area of food safety and control. Of particular interest to the CCCF is a new CRP on Integrated Radiometric and Complementary Techniques for Mixed Contaminants and Residues in Foods (Reference D52041). This was designed and planned in 2016 and is being initiated this year, with its first research coordination meeting planned for 19−23 June 2017, at the IAEA Headquarters in Vienna, Austria. An international network of participant laboratories and institutions is being recruited. The research network will develop systematic programmes for measuring mixtures of contaminants and residues and develop necessary multi-class analytical methods. The overall aim is to leverage the advantages of nuclear, isotopic and complementary techniques to strengthen the capacity of Member State analytical laboratories and national contaminant and residue monitoring programs thus contributing to food safety and enabling international trade. New multi-class analytical methods will be developed, validated and transferred to control laboratories. It is envisaged that the research could also yield data on contaminants that would be of interest to the CCCF.

[4] IAEA Safety Standards Series No. GSR Part 3
[5] http://www-naweb.iaea.org/nafa/news/2016-FAO-IAEA-NARO.html
[6] A full list is available in our latest Newsletter, pages 18-23:
http://www-pub.iaea.org/MTCD/Publications/PDF/Newsletters/FEP-20-1.pdf

Activities and Training

8. As regards providing input to Codex and receiving feedback from Codex member countries for future research and development work, participation at Codex meetings over the past year has included the Codex Alimentarius Commission meeting, the previous CCCF, the meeting of the Codex Committee on Pesticide Residues, a meeting of the Coordinating Committee for Asia, and the Codex Committee on Residues of Veterinary Drugs in Foods. The Joint FAO/IAEA Division has been involved in providing data to Codex and helping develop many Codex standards, a recent example being participation in the electronic working group on maximum levels for cadmium in chocolate and cocoa products.

9. In 2016 many technical meetings and workshops were requested by our member countries and in addition, the Joint FAO/IAEA Division was also invited to participate at a full range of technical conferences and meetings. These included meetings and events to mark 30 years after Chernobyl (April, Belarus), The Third Food Integrity Conference (April, Czech Republic), EuroResidue VIII (May, the Netherlands), Asian Development Bank Food Security Forum (June, Philippines), The Korean Society for Environmental Agriculture 'Integrated Management of Agricultural Environment for Food" (July, Republic of Korea) and the INFOSAN (International Food Safety Authority Network) New Science for Food Safety: Supporting Food Chain Transparency for Improved Health (November, Singapore).

10. Over 780 food specialists, from all regions of the world, have been trained through our activities in 2016. Highlights include the following bespoke regional courses and workshops: Awareness on analytical methods and challenges in food authenticity, safety and traceability (hosted in Austria with the participation of specialists from Iraq, Libya, Syria, Kuwait & the Marshall Islands); Nuclear / Isotopic and Complementary Techniques in Food Safety (several countries of Africa and hosted in Malawi); Training on Sampling and Data Processing for Food Safety Laboratories (hosted in Botswana); Analytical Method Development and Validation (hosted in Benin); Food Microbiology Training (Namibia); Quality Management for Food Safety Laboratories (international participation and hosted in Indonesia); Food Sampling Training (hosted in Colombia), and; Training on Sampling for Pesticide and Mycotoxin Analysis (hosted in Bahrain).

Networks and Technical Publications

11. The Joint FAO/IAEA Division continues to promote the formation of regional laboratory/food safety networks, including the Latin American and Caribbean Analytical Network (RALACA)[7]; the African Food Safety Network (AFoSaN)[8], and; a new food safety laboratory network of 18 countries in the Asia and the Pacific region is also developing. A new interregional project is also providing a platform for countries to collaborate and jointly address food safety and control issues and is helping to open up new opportunities to share experience and resources. Recent publications include a special issue of the journal *Food Control* reporting the proceedings of the FAO/IAEA Symposium on Food Safety and Quality[9]. The Food and Environmental Protection Section's Newsletter[10] provides a full list of our technical and scientific publications but the overall statistics for 2016 are impressive and include 15 articles in peer reviewed journals, 14 conference papers, two special editions of scientific journals, two IAEA-TECDOCs, five manuals and one chapter in a specialist book series.

[7] See: http://red-ralaca.net
[8] See: http://www.africanfoodsafetynetwork.org/
[9] http://www.sciencedirect.com/science/journal/09567135/72/part/PB
[10] http://www-pub.iaea.org/MTCD/Publications/PDF/Newsletters/FEP-20-1.pdf

PART II:
ACTIVITIES OF THE OECD NUCLEAR ENERGY AGENCY IN FOOD AND AGRICULTURE

(Prepared by the OECD/NEA Division of Radiological Protection and Radioactive Waste Management)

1. The OECD Nuclear Energy Agency (NEA) is an international, intergovernmental organisation of 31 member countries, dedicated to: foster international co-operation to develop the scientific, technological and legal bases required for nuclear and radiological safety: develop authoritative assessments and forge common understandings on key issues as input to government decisions on nuclear technology policy; and conduct multinational research into challenging scientific and technological issues[1]. In particular since the Chernobyl nuclear power plant accident, the NEA's Committee on Radiological Protection and Public Health (CRPPH) has focused significant effort on helping member countries to learn lessons and improve their preparedness for nuclear emergency and recovery situations, and has published over 50 expert group reports on emergency and recovery management[2]. Of particular relevance to the Codex Committee on Contaminants in Foods, is the Committee's recent work on food safety science, and on the post-accident management of food[3,4].

2. Following the Fukushima Daiichi Nuclear Power Plant accident in March 2011, considerable public concern arose regarding the management of food in and from Japan. These concerns were raised in Japan, as well as in surrounding countries. Unfortunately, it was quickly realised that the existing frameworks for decision-making with regard to food imports seemed inadequate for addressing the challenges presented by this unprecedented event.

3. The areas affected by the accident are agricultural, producing many food products, including rice, vegetables, beef, persimmons, and peaches. In addition, the area is an important region for fisheries in Japan. The food products of the region had been very well-regarded both in Japan and abroad. However, some of the people living in affected areas remain concerned for their health and for their future livelihood.

4. In the aftermath of the accident, populations living outside the directly affected areas were also concerned about consuming food products from Fukushima. In Tokyo, which is located approximately 240km south of Fukushima, some shops entirely ceased to carry certain food items simply because the best examples were commonly from the Fukushima region. Many of Japan's trading partners, which were concerned about importing food thought to be contaminated, showed similar reactions.

5. These concerns posed a complex, multi-layered problem with local, national and international implications, for which there were no broad, internationally-agreed approaches. This stands as an important lesson to be absorbed from the accident and highlights a need for international focus.

6. To secure distribution of safe agricultural and livestock products, good agricultural practices to produce safe food and feed including reduction measures of radionuclides from farmland have been implemented in Japan. The regulation limits have been set consistent with the approach stipulated in the international standards/guidelines, i.e. Codex guidelines. Food monitoring/inspection has also been conducted for an enormous number of samples every year. These measures have been combined to assure that food entering the domestic and international markets meets stringent Japanese food standards.

NEA Workshop on Food-Safety Science[5]

7. On request of the Japanese government, the NEA's Committee on Radiological Protection and Public Health (CRPPH) organised an international workshop on post-accident food safety science. The workshop objectives were to present the state of the art scientific aspects of post-accident food safety, including: radionuclide transfer to foodstuffs and dose modelling; agricultural management to reduce food contamination and measurement techniques. The workshop also addressed the status and remaining challenges to local, national and international management of post-accident food safety, and discussed approaches for addressing remaining challenges.

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1. http://www.oecd-nea.org/
2. http://www.oecd-nea.org/rp/
3. EGRPF Sub-Group on Trade in Commodities and Food: Recommendations for a Framework for the Development of Trade Criteria for Food, Consumer Products and Commodities, OECD NEA, NEA/CRPPH(2013)6, April 2013, Paris
4. An Evidence-based Approach to Post-accident Food Safety: Policy and Insights for Protection Optimisation, OECD NEA, NEA/CRPPH/R(2015)1, September 2015, Paris
5. http://www.oecd-nea.org/rp/

8. Just prior to the workshop the Japanese government organised a visit to several food assessment sites where the certification for marketing is performed for seafood, meat products, rice and dried persimmons. The state-of-the-art nature of equipment and processes was exhibited to foreign participants in the workshop.

9. The workshop's first and second sessions presented an overview of the agricultural circumstances in Japan, and local Japanese approaches to post-accident agriculture respectively. The agricultural soils in Fukushima prefecture are high in clay content, which tends to bind caesium. Reduction of caesium-137 content in soil has thus been slow, and so agricultural management has been more reliant on reducing plant and livestock uptake of radionuclides than on their removal. Topsoil removal and deep ploughing have been effective, as has the use of potassium fertilizer for rice farming. Fruit tree management has involved such techniques as the removal of bark, and the use of removable grass sod around the base of fruit trees to take away caesium in the first few centimetres of soil. For tea plants the trimming of outer leaves was particularly successful just after the accident. Livestock management has involved clean feed, and in-situ pre-slaughter measurement of animals. Fishing restrictions and rapid dilution of radionuclides in ocean water and sediments have contributed significantly to the management of seafood products.

10. Presentations of efforts to prevent caesium uptake by food products (e.g. fruit, vegetables, livestock, seafood), of efforts to monitor food products for authorisation to enter the market, and of efforts to demonstrate to consumers the quality of food products from Fukushima prefecture showed how radiologically successfully food products are being managed. However, presentations also showed the level of public concern remaining, suggesting that more effective approaches to addressing consumer concerns will be needed to regain consumer confidence.

11. Associated with the question of consumer confidence, the workshop addressed international standards and post-accident agricultural science. Codex Alimentarius provides internationally agreed importation standards for food products, developed on a generic basis. These usefully provide a generic, international framework for post-accident food trade. The NEA proposed a holistic, accident-specific framework, including a neutral, international-expert validation process, to help build national and international confidence in domestic approaches. In this context, the latest thinking on internal dose calculation and on radiological, spectroscopic assessment were presented.

12. Presentations of relevant international experience addressed post-Chernobyl management of sheep in the UK, reindeer in Norway, and crops in Belarus. The approaches taken in Japan to address these issues showed that these lessons were being used and adapted to Japanese cultural and accident-specific circumstances. This was seen to well-embrace state-of-the-art scientific approaches.

13. In conclusion, the workshop presented a broad picture of the post-accident food-management situation in Japan, of the approaches being taken to address challenges, and of how these have effectively used post-Chernobyl experience and state-of-the-art science. The importance of cultural heritage and social values in the post-accident management of such socially important aspects as food products was demonstrated, and should be more directly addressed in recovery planning.

14. The continuing lack of trust in food products from Fukushima prefecture was strongly emphasized. This suggests the need for a coordinated communications strategy, involving farmers, distributors, the Fukushima prefecture government and the Japanese central government. Aspects that could be considered could be such things as taking independent, international validation into account, and inviting co-expertise measurements by, for example NGOs, could be considered as trust building approaches. Further support of prefecture and municipal projects by central governmental expertise could also be considered.

15. Further research into such areas as transfer of radionuclides to food products, countermeasures for rice and fruits that are more approaching "normal" farming practices, and long-term impact on marine fish and seafood, could be addressed and communicated.

Post-Accident Food Management Framework[6]

16. An NEA member-country survey of government decisions and criteria for accepting food trade from Japan following the Fukushima accident, and experience since the accident, have demonstrated two things. First, the large variety in governmental survey responses demonstrated that there is no common understanding of existing international post-accident food trade guidance, and that existing international guidance only partially addresses the entire context of post-accident management of food. Second, experience since the accident has demonstrated the need to improve domestic and international confidence and trust in post-accident governmental food safety decisions (e.g. food-marketing criteria, food certification processes).

6. EGRPF Sub-Group on Trade in Commodities and Food: Recommendations for a Framework for the Development of Trade Criteria for Food, Consumer Products and Commodities, OECD NEA, NEA/CRPPH(2013)6, April 2013, Paris

17. To address the first issue, the NEA's Committee on Radiological Protection and Public Health (CRPPH) has developed a comprehensive post-accident food-management framework that is included in annex to this note. This inclusively describes the management of: food production in accident-affected agricultural lands; consumption of locally-produced food by residents of accident-affected areas; marketing of locally-produced food in accident-affected areas; domestic marketing of food produced in accident-affected areas; export of food from accident-affected countries; and import of food from accident-affected countries. To help assure broad international coherence, the technical aspects of this framework are being discussed with the UN Food and Agriculture Organisation (FAO) Codex Alimentarius Committee on Contaminants in Food (CCCF). The framework is also being included in new ICRP recommendations currently being drafted for the Protection of People in the Event of a Nuclear Accident. Beyond these technical aspects, we feel it is time to begin broad international engagement, thus our request for an exchange between FAO and NEA management.

18. To address the second issue, and help improve domestic and international confidence and trust in governmental food-safety decisions, often a neutral and international opinion is of value. To offer this, the proposed post-accident food-management framework includes a two-team validation process. One international team, of experts in calculating dose from eating contaminated food, would review and scientifically validate, as appropriate, the science and assumptions used by the accident country to establish numerical criteria for food consumption and marketing. This would not involve questioning the resulting numerical criteria, but rather the science behind it. A second international team, of experts in radiological measurement, would review, and scientifically and technically validate, as appropriate, the science and technology used by the accident country to measure contamination in food products and certify, as appropriate, food as meeting government criteria.

19. Discussions with emergency and recovery management experts support this framework and twofold international validation process as positive steps to increase confidence, both domestically and internationally, that the accident country's consumption criteria are scientifically well based, and that the process of certifying all marketed food as meeting these criteria are scientifically and technically state-of-the-art. To achieve broad discussion, technical agreement and political recognition of this framework will require an extended effort to develop some level of formal, governmental agreement. Collaboration with the CCCF and the FAO on this issue is essential to improving the current situation.

Annex
Food Management Framework

The CRPPH post-accident food management framework: recognises the responsibility of the accident country to develop an accident-specific approach to food criteria and management; acknowledges the political, social and ethical rational for a consistent approach and single criteria for domestic consumption and exportation of food; and proposes that importing countries accept the accident country's export criteria for allowing importation.

Framework Assumptions

- Accidents are rare and are unique
- Affected food products will be accident specific
- There are a limited number of export food products from any affected area
- Consumption and export criteria are a matter of national choice and will evolve with circumstances

Emergency Food Actions

- Food consumption in areas modelled to be affected will be banned / restricted rapidly
- Food distribution and export from areas modelled to be affected, will be banned / restricted rapidly
- Food consumption, distribution and export will be resumed only after:
  - the accident is under control
  - affected areas have been radiologically characterised
  - national criteria have been established, and
  - a measurement / certification process has been established

Framework National Consumption Criteria Assumptions

- National criteria should be based on pre-determined risk assessments
- National criteria will need to be refined to address actual prevailing circumstances:
  - What food products are affected
  - What radionuclides have been released
- Criteria refinement can take place during the time that the accident is being brought under control and affected areas are being characterised
- Criteria will be developed to protect the most exposed group – those living in the affected area

Post-Accident Food-Management Framework

- For affected food, national consumption criteria will be developed in easily measurable quantities:
  - Activity concentration (Bq/kg)
  - Based on an assumed annual food consumption (kg/a)
  - Such that eating affected food will not cause a radiation exposure over a specified level (mSv/a)
- Codex Alimentarius levels should be used as a ceiling for national consumption criteria
- It will be socially, politically and perhaps ethically difficult for a country to use different criteria for those living in the affected area and those living in unaffected areas
- Similarly, criteria for national consumption will most likely be used as export criteria
- Importing countries should use the accident country's export criteria as their import criteria
- The Framework thus uses the same consumption criteria for the local, national and international management of food from post-accident affected areas