GFORSS | GLOBAL FOOD REGULATORY SCIENCE SOCIETY

ARAB CODEX INITIATIVE | المبادرة العربية للدستور الغذائي

ANALYSIS OF AGENDA ITEMS IN PREPARATION FOR THE 17th SESSION OF THE CODEX COMMITTEE ON CONTAMINANTS IN FOOD (CCCF17)

15 - 19 April 2024 • Panama City, Panama

Objectives

This document offers an analysis of agenda items to support participation in the 17th session of the Codex Committee on Contaminants in Food (CCCF17), taking place in Panama from 15 to 19 April 2024.

The document is intended for possible use by the Codex communities of practice promoted by the Global Food Regulatory Science Society (GFoRSS) as part of their contribution to enhancing awareness and supporting effective participation in international standard setting meetings (Codex meetings) by representatives from members and observers.

The analysis provided in this document offers a factual review of key agenda items of CCCF17, pertaining to:

A. **Agenda Item 5.1: Maximum levels for lead in certain food categories (at Step 4**)
B. **Agenda item 6.1: Sampling plans for methylmercury in fish (at Step 4)**
C. **Agenda item 7: Definition for ready-to-eat peanuts for the establishment of a maximum level for total aflatoxins in this product**
D. **Agenda Item 9.1: Code of practice/guidelines for the prevention or reduction of ciguatera poisoning (At Step 4)**
E. **Agenda Item 13: Discussion paper on Lead and Cadmium in Quinoa**
F. **Agenda Item 14: Discussion Paper on the Review of the Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Peanuts**
G. **Agenda Item 15: Discussion Paper on Review of the Code of Practice for the Reduction of Aflatoxin B1 in Raw Materials and Supplemental Feedingstuffs for Milk-producing Animals**
H. **Agenda Item 16.1: Development of a Code of practice for the prevention and reduction of cadmium contamination in foods**

This document will offer an analysis of select key agenda items to support the development of positions at the national and regional level.

This analysis is indicative in nature and does not represent an official position of the organization, its membership or its management.

**It is important to note that experts – members of the Expert Working Group – do not represent the organizations and / or jurisdictions to which they are affiliated. The selection and participation in the Expert Working Group proceedings is based on each expert's own credentials and experience, which should not be misconstrued as the country's / delegation's / organization's position to which they belong.*

A. Agenda Item 5.1: Maximum levels for lead in certain food categories (at Step 4)

Document Number: CX/FO 24/28/2

Background

Lead is a naturally occurring toxic metal found in the environment and in different products. Its widespread use has resulted in extensive environmental contamination, human exposure and significant public health problems in many parts of the world. Considering the conclusions of JECFA73 (2011) about dietary lead exposure stating that there is no safe level of lead, international organizations include the reduction of risks of exposure to lead among the priority themes in terms of environmental health.

CCCF started working since its 6th session on the revision of Maximum Levels (MLs) for lead established in the General Standard for Contaminants in Food and Feed (CXS 193-1995) to reduce dietary exposure to lead.

The key decisions reached by the committee are presented below:

- **At the CCCF11 (2017),** The Committee agreed to expand the work on lead beyond the food categories listed in CXS 193, with the consideration of new Maximum Levels (MLs) for a range of food commodities.
- Since then, an Electronic Working Group (EWG) led by Brazil has been working on proposals for new MLs for lead in selected food commodities.
- **At the CCCF12 (2018) and CCCF13 (2019)**, the committee discussed the criteria to select new food categories for ML elaboration, considering international trade and potential exposure. CCCF13 agreed to focus on **MLs proposals for lead in food for infants and young children**, except those for which MLs have already been established in CXS 193, spices and aromatic herbs; eggs and sugars and confectionery, excluding cocoa.
- **T**he EWG established at CCCF13 worked on lead data extracted from the GEMS/Food Database considering results from 2008 – 2019. MLs were proposed for eggs, preserved eggs, fresh and dried culinary herbs and spices (fruits and berries; fresh and dried rhizomes, bulbs and roots; bark; floral parts; seed).
- **At the CCCF14** (**May 2021)**, CCCF agreed to:
  - i. Clarify that the MLs for **fruit juices and grape juices** in CXS 193 also apply to infants and young children. These MLs were adopted at CAC44;
  - ii. Discontinue work on an ML for **herbal teas, yoghurt, cheese and milk-based** products for infants and young children;
- **At the CCCF15** (**2022)**, CCCF agreed to:
  - i. **Discontinue work on fresh eggs** due to its low relevance for international trade and the low occurrence levels observed;
  - ii. **Discontinue work on ML for dried garlic** given that there is already an ML of 0.1 mg/kg for fresh garlic on the GSTCFF;
  - iii. **Discontinue work on molasses** as there was not sufficient data to establish an ML.
  - iv. Recommend the adoption by CAC45 the following MLs at Step 5/8:
    - Cereal-based foods for infants and young children at **0.02 mg/kg**;
    - White and refined sugar, corn and maple syrups and honey at **0.1 mg/kg**
    - Sugar-based candies at **0.1 mg/kg**,
  - v. To consider a separate ML for brown and raw sugar due to the high value of these commodities in international trade and because they are likely to contain more lead than white or refined sugar.
  - vi. Forward the ML for lead at 0.02 mg/kg at Step 5 for ready-to-eat meals for infants and young children and to further consider at CCCF16 (2023) the potential exclusion of certain foods that may not be able to achieve this ML.

vii. Re-establish the EWG, led by Brazil, to consider MLs for **ready-to-eat meals for infants and young children (exclusion of certain foods) and brown and raw cane sugars** based on data currently available in GEMS/Food for consideration by **CCCF16 (2023)** and MLs for **culinary herbs** (fresh/dried) and **spices** (dried) following a JECFA call for data in 2022 for consideration by **CCCF17 (2024).**

At the CCCF16, delegates discussed MLs proposed by the EWG chaired by Brazil, for sugar in certain food categories (soft brown, raw and non-centrifuged), and for ready-to-eat meals for infants and young children (exclusion of certain foods) (at Steps 4 and 7).

CCCF16 agreed to:

- forward to CAC46 the following MLs for adoption:
  - For soft brown sugar, raw sugar and non-centrifuged sugar (including Panela and Mascavo): a single ML at 0.15 mg/kg at step 5/8, and
  - For ready-to-eat meals for infants and young children, a single ML of 0.02 mg/kg at step 8.
- To continue the work on MLs for lead for culinary herbs (fresh/dried) and spices; for this purpose, the EWG will present their proposals for these commodities at CCCF17 for consideration;
- To encourage Codex members to submit data with clear identification of the dried/fresh state of the samples of culinary herbs and spices to GEMS/Food database and if no agreement is reached at CCCF17, to discontinue work on this category.

At the CCCF17, delegates will discuss EWG's proposals within the establishment of MLs for culinary herbs (fresh/dried) and spices (at Steps 4) (**Agenda Item 5**).

- For spices:
  - 8 MLs were proposed (as presented in the table below).
  - In addition, the EWG suggests to evaluate if the MLs should consider the whole category or only the specific spices for which there are data available on GEMS/Food database.

Commodity/ Product Name	Maximum Level (ML) mg/kg	Portion of the Commodity/Product to which the ML applies	Notes/Remarks
Spices, dried bark[a]	2.5	whole, ground, powder, crushed	
Spices, dried flowers[b]	0.4	whole, ground, powder, crushed	
Spices, dried floral parts[c]	2.5	whole, ground, powder, crushed	Relevant Codex commodity standard is CXS 344-2021.
Spices, dried fruits and berries[d]	0.6	whole, ground, powder, crushed	The ML does not apply to Sichuan pepper. Relevant Codex commodity standards are CXS 326-2017 and CXS 353-2022.
Sichuan pepper	3.0	whole, ground, powder, crushed	
Spices, dried rhizomes, bulbs and roots[e]	2.0	whole, ground, powder, crushed	The ML does not apply to dried galangal and garlic. Relevant Codex commodity standard is CXS 343-2021.
Spices, dried seeds[f]	0.8	whole, ground, powder, crushed	Relevant Codex commodity standards are CXS 327-2017 and CXS 352-2022.
Spices, dried aril[g]	0.9	whole, ground, powder, crushed	

a: Cinnamon, canella, cassia. b: Chamomile flower. c: Saffron, Cloves, Capers. d: Star Anise, Cardamom, Cayenne, Black pepper, Green pepper, White pepper, Pink pepper, Red pepper, Paprika, Peppers chilli, Pimento, Tamarind, Sumac, Vanilla. e: Ginger, Turmeric. f: Anise seed, Coriander seed, Cumin seed, Dill seed, Fenugreek seed, Fennel seeds, Mustard, Nutmeg. g: Mace

❖ **2 MLs were proposed also for culinary herbs as follows:**

Commodity/ Product Name	Maximum Level (ML) mg/kg	Portion of the Commodity/Product to which the ML applies	Notes/Remarks
Fresh culinary herbs	0.2	Whole commodity	
Dried culinary herbs	2.5	Whole commodity	Relevant Codex commodity standards are CXS 328-2017, CXS 342-2021, CXS 345-2021.

Analysis

33 countries and 3 organizations participated in the EWG's work led by Brazil, to consider MLs of lead for culinary herbs and spices based on data currently available on GEMS/Food for consideration by CCCF17 (2024).

New call for data was conducted in 2022[1] to consider MLs by CCCF17.

The EWG's members developed their report, presented it twice to the members to provide their comments, and received comments from **Canada, Chile, China, Indonesia, Iran, Japan, Mexico, the Netherlands, Thailand, Turkey, the United States of America and IOSTA (International Organization of Spice Trade Associations).**

Analysis of the methodology followed by the EWG to handle the data

The EWG established their proposals considering the following statements and decisions:

❖ To consider the availability and amount of occurrence and consumption data;

❖ To do the reclassification of subcategories proposed for spices and culinary herbs based on the classification established by the Committee on Spices and Culinary Herbs (CCSCH) in REP22/SCH06, Appendix VIII;

❖ To analyse the datasets with and without samples with limit of quantification (LOQs) higher than the initial proposed ML;

❖ To derive a second dataset resulting from data treatment based on the steps described below[2]**:**

- Following the Lower Bound (LB) scenario, results below the limit of quantification (LOQ) and limit of detection (LOD) were replaced by zero. Following the Upper Bound (UB) scenario, results below the LOD were replaced by the numerical value of the LOD and those below the LOQ were replaced by the value reported as LOQ.
- The EWG excluded results obtained with methods with a LOQ higher than the initial proposed ML and no relevant impact were observed (it was observed that 20% of results of lead were non-detectable (ND)).
- Summary statistics including total number of samples, mean, and 95th percentile (P95) concentrations were determined for this second dataset for each category.

The EWG worked with 7,519 data points in total that were indicated as appropriated using the "Guidance on data analysis for development of maximum levels and for improved data collection".

❖ The EWG analysed 19,264 data extracted in February 2023 by the WHO administrator of GEMS/Food database, covering data from 2011 to 2022 of lead levels in spices and culinary herbs;

❖ Only samples submitted as being herbs (considered as culinary herbs and not for infusion), spices and condiments, meeting basic criteria, were considered by the EWG;

❖ 4,063 new data points were submitted in 2022 from Canada, China, European Union, United Kingdom, New Zealand,

[1] https://www.who.int/news-room/articles-detail/Call-for-data-lead-in-food-commodities-in-fresh-and-dried-culinary-herbsand-dried-spices

[2] To handle left-censored data and according to the substitution methodologies presented in the document "Guidance on data analysis for the development of maximum levels and improved data collection" (under discussion by CCCF), the EWG decided to present the results using LB and UB methods after converting all data to the same units (mg/kg) and decided

United States and 3,097 were sampled after 2011.

- 6,532 samples **for dried spices** were considered by the EWG.
  - The data were submitted from 35 countries and 6 regions: ***AFRO (Comoros, Zambia, South Africa, Nigeria, Kenya), EMRO (Syrian, Iran, Egypt, Afghanistan) , EURO (Ukraine, Spain, European Union, Turkey, Yugoslavia), PAHO (Brazil, Canada, Ecuador, Guatemala, Honduras, Jamaica, Mexico, Peru, Uruguay, USA), SEARO (India, Indonesia, Sri Lanka, Thailand), WPRO (China, Japan, Malesia, New Zealand Singapore, Vietnam)***;
  - From the 7,624 data (dried and non-identified as fresh spices), 1,092 data points that corresponded to non-classified spices were excluded, leaving 6,532 samples;
  - The samples identified clearly as being fresh were excluded considering that spices are in general traded dried and to retain the samples of spices that were not identified as "fresh" or "dried";
  - Only anise seed was considered as being spices, dried seeds;
  - Sichuan pepper DATA were excluded from the category fruit and berries spices, as data were from only one country and the levels were higher than the remaining commodities in the category;
  - Due to the views expressed for the group dried rhizomes, bulbs, and roots in CCCF153, the EWG excluded targeted and fresh samples and analysed separately turmeric and ginger samples.
  - **The lowest** levels of lead were observed in the EMRO region (Afghanistan, Egypt, Iran, and Syria) corresponding to **0.10 mg/kg**;
  - Dried spices, when categorized by similarity (7 groups), have mean levels of lead ranging from ***0.05 mg/kg to 0.70 mg/kg (LB)*** and from ***0.06 mg/kg to 0.70 mg/kg (UB)***;
- For culinary herbs 3,866 data points of lead (fresh, dried, and non-identified either as fresh or dried), were identified after excluding samples collected before 2011 and applying the exclusion criteria.
  - The data were submitted from 5 regions: ***EMRO (Morocco, Egypt), EURO (Albania, Poland, Spain, United Kingdom, Turkey, EU), PAHO (Brazil, Canada, Mexico, Peru, Uruguay, USA), (SEARO (India, Thailand), WPRO (New Zealand, Singapore);***
  - 978 data points in dried (dried, ground, powder) and fresh culinary herbs were considered;
  - Only samples clearly identified as dried and fresh were considered*;*
  - Mean, 95th percentile, minimum and maximum levels for lead in dried and fresh culinary herbs were estimated;
  - Mean levels of lead (UB) were higher in dried culinary herbs (**0.72 mg/kg**) than fresh culinary herbs (**0.04mg/kg**).

Analysis of the hypothetical effect of the proposed MLs for lead

The EWG made recommendations for MLs of lead in the studied commodities considering the following statements and parameters:

(1) To use the approach "as low as reasonably achievable" (ALARA) since JECFA did not identify a safe level of lead exposure.

As approved at CCCF14, a maximum cut-off at 5% was adopted but with the acceptable rejection rates to be determined on a case-by-case basis in CCCF14.

(2) two key parameters were analysed, the sample rejection rate (SR) and the resulting reduction of exposure to lead or intake reduction (IR), aiming for the highest possible reduction of exposure, while maintaining a SR below 5%.

- The impact of sample rejection and lead intake on proposed hypothetical MLs for each commodity was calculated and presented in the final document of EWG.

[3] CCCF15 noted that there was general support to establish a single ML for dried rhizomes, bulbs, and roots, but there were divergent views as to the ML equal to or lower than 2.0 mg/kg.

- Hypothetical MLs and the rate of sample rejection were analysed, and MLs were proposed to be discussed during CCCF17 (**Table 1**).
- The application of the proposed MLs led to the following hypothetical outcome using the data available:

Table 1: Effect of the implementation of hypothetical MLs for lead on dried spices, based on UB approach.

	ML (mg/kg)	Mean level (mg/kg)	Sample rejection (%)	Intake reduction
Spice, dried, aril	0.9	0.21	3.1	12.5
Spice, dried, bark	2.5	0.41	4.2	30.9
Spice, dried, floral parts	2.5	0.21	4.8	45.2
Spice, dried, flowers	0.4	0.03	4.8	51.8
Spice, dried, Sichuan pepper	3	0.75	3.8	20.5
Spice, dried, fruits & berries excluding Sichuan pepper	0.6	0.14	3.8	30.6
Spice, rhizomes, bulbs and roots, only reported as dried, excluding galangal, asafoetida, ganthoda and haldi	2.0	0.37	4.9	66.5
Spice, dried, seeds	0.8	0.15	4.5	28.7
Dried culinary herbs	2.5	0.588	3.1	18.6
Fresh culinary herbs	0.2	0.037	2.2	12.8

Recommendations

Based on the effect of the criteria mentioned before, the EWG proposed the following MLs:

- **For spices**
  - **2.5 mg/kg**: Spice, dried, bark
  - **2.5 mg/kg**: Spice, dried, floral parts
  - **0.9 mg/kg**: Spice, dried, Aril
  - **0.8 mg/kg**: Spice, dried seeds
  - **0.6 mg/kg**: Spice, dried fruits & berries, excluding Sichuan pepper[4]
  - **3.0 mg/kg**: Sichuan pepper
  - **0.4 mg/kg**: Spice, dried, flower
  - **2.0 mg/kg**: Spices, dried rhizomes, bulbs and roots, excluding galangal and garlic
- **For culinary herbs**
  - **0.2 mg/kg**: fresh culinary herbs
  - **2.5 mg/kg**: dried culinary herbs

[4] The proposed ML would reject 51% of Sichuan pepper samples. Therefore, the EWG recommends establishing MLs for the category Spice, dried, fruits & berries excluding Sichuan pepper and establish a ML of 3 mg/kg for Sichuan pepper.

Analysis of the new ML proposals to be discussed at CCCF17 compared with those proposed by the EWG at CCCF15

Table 2: Comparison between MLs previously discussed at CCCF15 and the newly proposed MLs.

Commodities	ML (mg/kg) CCCF15	ML (mg/kg) CCCF17 New propositions	Commentary
Culinary herbs (fresh)	0.25 (except Rosemary)	0.2 The whole commodity	The first MLs proposed in CCCF15 were revised downwards, except for dried culinary herbs. During CCCF17, the EWG suggests evaluating if the MLs should consider the whole category or only the specific spices for which there are data available on GEMS/Food database.
Rosemary (fresh)	0.5	-	
Culinary herbs (dried)	2.0	2.5 The whole commodity	
Dried spices, Floral parts (cloves, excluding saffron)	2.5	2.5	
Fruits and berries, spices	0.8 (excluding star anise and sumac)	0.6 (excluding Sichuan pepper)	
Rhizomes, bulbs and roots spice	3.5 (excluding garlic)	2 (excluding galangal and garlic)	
Sichuan pepper	-	3	New specific MLs were proposed for these commodities.
Spice, dried, bark	-	2.5	
Spice, dried, Aril	-	0.8	
Spice, dried seeds	-	0.9	

Impact of the proposed MLs in the Arab region

In order to strengthen the capacities of the region in the field of health risk analysis, the expert working group affiliated to the Arab Codex Initiative conducted research to identify studies carried out in the Arab countries reporting occurrence data for contaminants.

A systematic scanning of the scientific literature was performed, including documents published between 2005 and 2023. Over 300 articles were retrieved, representing the 22 Arab countries and their activities on monitoring metallic trace elements in food.

Concerning lead contamination in spices and culinary herbs, the data collected (92 data points) shows that various levels can be found, ranging from below LOD to some values exceeding the MLs proposed by the EWG. **Table 3** summarizes these findings.

Table 3: Summary of findings resulting from the comparison between proposed MLs and occurrence levels of lead in the Arab region.

Commodities	ML (mg/kg) CCCF17 New propositions	Commentary
Culinary herbs (fresh)	0.2	33 studies out of 50 show an average contamination value above the proposed MLs.
Culinary herbs (dried)	2.5	
Dried spices, Floral parts (cloves, excluding saffron)	2.5	One study out of five shows average contamination values above the proposed ML.
Fruits and berries, spices	0.6 (excluding Sichuan pepper)	Two studies out of three show average contamination values above the proposed ML.
Rhizomes, bulbs and roots spice	2 (excluding galangal and garlic)	No exceedance of the proposed ML was recorded (from two studies considered)
Sichuan pepper	3	-
Spice, dried, bark	2.5	One study showed average contamination values above the proposed ML.
Spice, dried, Aril	0.8	-
Spice, dried seeds	0.9	One study out of nine showed average contamination values above the proposed ML.

Conclusion and Recommendations

- Arab Codex delegations may support the establishment of MLs for lead in Spices and Culinary Herbs given their important consumption in several diets, including the Arab diets, and the potential detrimental health impact of lead.
- Arab Codex delegations may support efforts aiming to promote consensus at CCCF17, to reach MLs for lead in this category of food, to prevent the discontinuation of work.
- Arab delegations may support the method applied to reach the proposed MLs, noting that the EWG followed the previously agreed-on systematic approach based on the "as low as reasonably achievable" (ALARA) principle and on rejection rates of samples with a maximum cut-off at 5%. This robust approach was adopted in this case since JECFA did not identify a safe level of lead exposure. Moreover, extracted data from the GEMS/Food database represented 6 regions (AFRO, EMRO, EURO, PAHO, SEARO, WPRO) and 35 countries, which can be considered as a high geographical representativeness.
- Arab Codex delegations may support that the MLs in each spice group should be set for the whole category, however, recommends keeping the detailed list of spices that are included in the category for further information.
- Arab Codex delegations may support the fact that the majority of the proposed MLs are achievable. However, some deeper investigation may be needed for:

- Sichuan pepper considering the fact that data provided were only from one country and the levels were higher than the remaining commodities in the category;

- The category of culinary herbs (especially fresh herbs) considering the high occurrence of lead in these commodities in the Arab Region and the possible impact for trade (proposed ML may generate high sample rejection rate above 5% for Arab region).

The general recommendations are to:

- Generate occurrence data for lead in culinary herbs and spices which would support future submissions to the GEMS Food database
- Ascertain the achievability of the proposed MLs through on-going food monitoring activities ;
- Ascertain consultation with the food production sector on the possible impacts of the proposed MLs, including the availability and price of products are maintained.

B. Agenda item 6.1: Sampling plans for methylmercury in fish (at Step 4)

Document Number: CX/CF 24/17/6 ; CX/CF 24/17/6-Add.1

Background:

The CCCF17 is invited to consider the proposed sampling plan for methylmercury in fish.

- The conclusions of the 11th Session of the Codex Committee on Contaminants in Foods (CCCF11, 2017) in terms of progressing maximum levels (MLs) for methylmercury in fish identified that they should be accompanied by sampling plans.
- The draft sampling plan was discussed and presented to CCCF12 (2018) accompanying the proposed MLs for various fish species (CX/CF 18/12/7).
- Following editorial amendments, CCCF12 agreed to send the sampling plans to the Codex Committee on Methods of Analysis and Sampling (CCMAS) for endorsement and to request advice on:

  a. The necessary performance criteria for the MLs;

  b. Whether there is evidence that methylmercury can vary widely between individual fish sampled at the same time. How this would apply to large fish sold as individual units and whether the sampling plan provides enough basis to

deal with this; and

c. Whether the whole fish should be analyzed or only specific fractions of edible portions. Currently only mention is made that the mid-section should be sampled for some large fish.

- CCMAS39 (2018) was unable to respond to the questions raised in relation to the sampling plan as the questions were outside its remit (CX/CF 19/13/2). However, the Committee did not endorse the sampling plan for MLs for methylmercury in fish and agreed to return the sampling plan to CCCF for further consideration.
- At CCCF13 (2019) the Chair of the Electronic Working Group (EWG) informed the Committee that a revised sampling plan would not be presented for approval as there were areas of inconsistency with other sampling plans in the General Standard for Contaminants in Foods (CXS 193-1995) that needed to be addressed. It was agreed that the EWG would present these findings for consideration at CCCF14.
- At CCCF14 (2021) and CCCF15 (2022) it was agreed to continue further work on the sampling plan following the approach to include provisions for different weight and values classes and that further work should ensure the practicality of the sampling plan. It was also agreed to request information on national sampling plans for methylmercury or other contaminants in fish through a circular letter (CL) and that the work of CCMAS on the revision of the General Guidelines on Sampling be considered. Noting that sufficient time should be provided to gather information, CCCF15 agreed that the recommendations for the sampling plans be considered at CCCF17 (2024).
- The following information was sought from EWG and member countries via Circular Letter (CL 2022/47-CF) issued in September 2022:
  - National sampling plans available for mercury in fish, or other contaminants in fish, in particular: **tuna, shark, alfonsino, and marlin, orange roughy and pink cusk-eel**. Specific details requested include but were not limited to how and where the material has been sampled, typical ranges of commercial lot sizes and the feasibility of reconditioning sub-lots.
  - Data or studies from primary literature available on **the distribution of mercury** laterally and from **top (dorsal) to bottom (ventral) for tuna, shark, alfonsino, marlin, orange roughy and pink cusk-eel.**

Analysis

- The proposed sampling plan for methylmercury contamination in fish includes:
  - Definitions of key terms: Lot, Sublot Sampling plan, Incremental sample, Aggregate sample, Laboratory sample, Test portion;
  - Methodology for sample collection, guidelines for incremental and aggregate sample collection, and handling precautions for samples.
  - Subdivision of lots into sub-lots based on weight as presented in **Table 1**
  - Number of incremental samples to be taken depending on the weight of the lot as illustrated in **Figure 1**
  - Tissue area as presented in **Figure 2**
  - Packaging and transportation of samples
  - Sealing and labelling of samples
  - Sample preparation precautions
  - Homogenization – grinding
  - Analytical methods focus on a criteria-based approach to ensure compliance with established performance criteria.

Table 1: Subdivision of sub-lots according to Fishery Products bulk consignment lot weight and Fish Traded as Non-Bulk Consignments.

Commodity	***Lot weight (MT)***	***Weight (MT) or number of Sub-lots***
Fishery Products (Traded as Bulk Consignments)	*≥ 1500*	*500 MT per sub-lot*
	> 300 and < 1500	*3 sub-lots, with each sub-lot having a minimum of 100 MT*
	≥100 and ≤ 300	*100 MT per sub-lot*
	< 100	*Not Defined*
Fish (Traded as Non-Bulk Consignments)	*≥ 15*	*15 and 30 MT*
	< 15	*no subdivision*

- ***1 metric ton (MT) = 1000 kilograms***

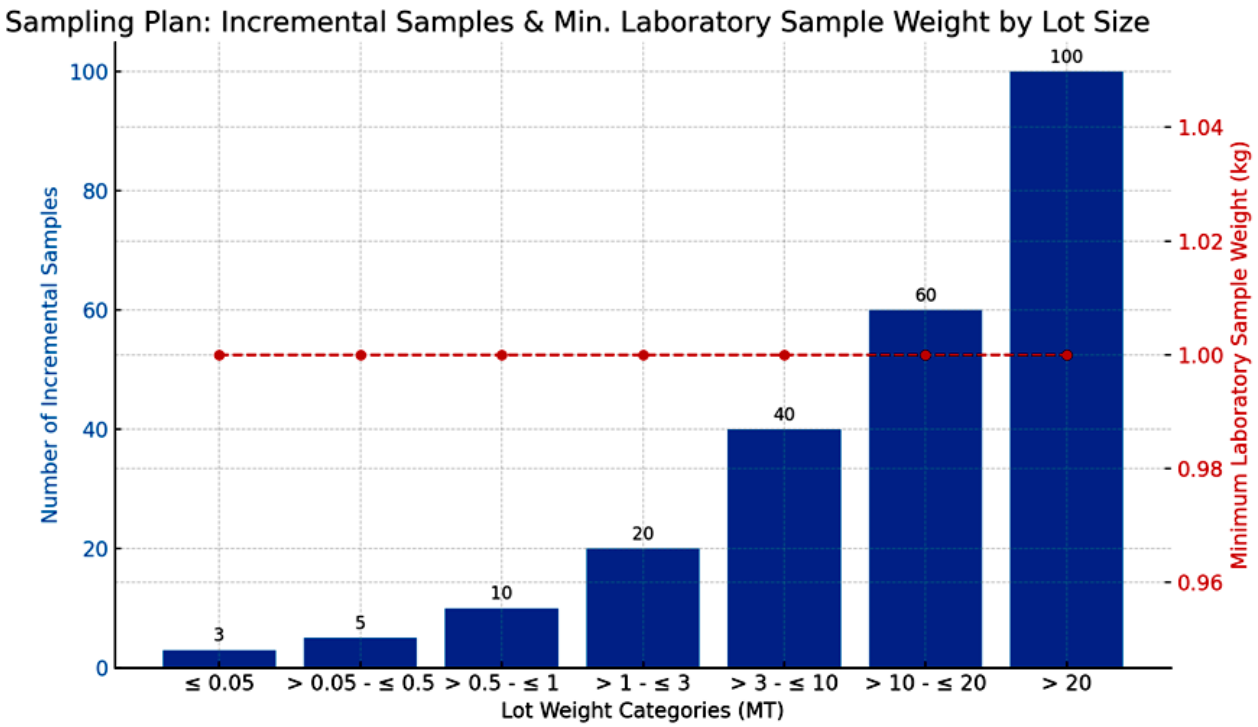

Figure 1: Number of incremental samples to be taken depending on the weight of the lot.

The illustration in **Figure 2** represents the three classes of fish weight categories and includes annotated text describing the sampled parts.

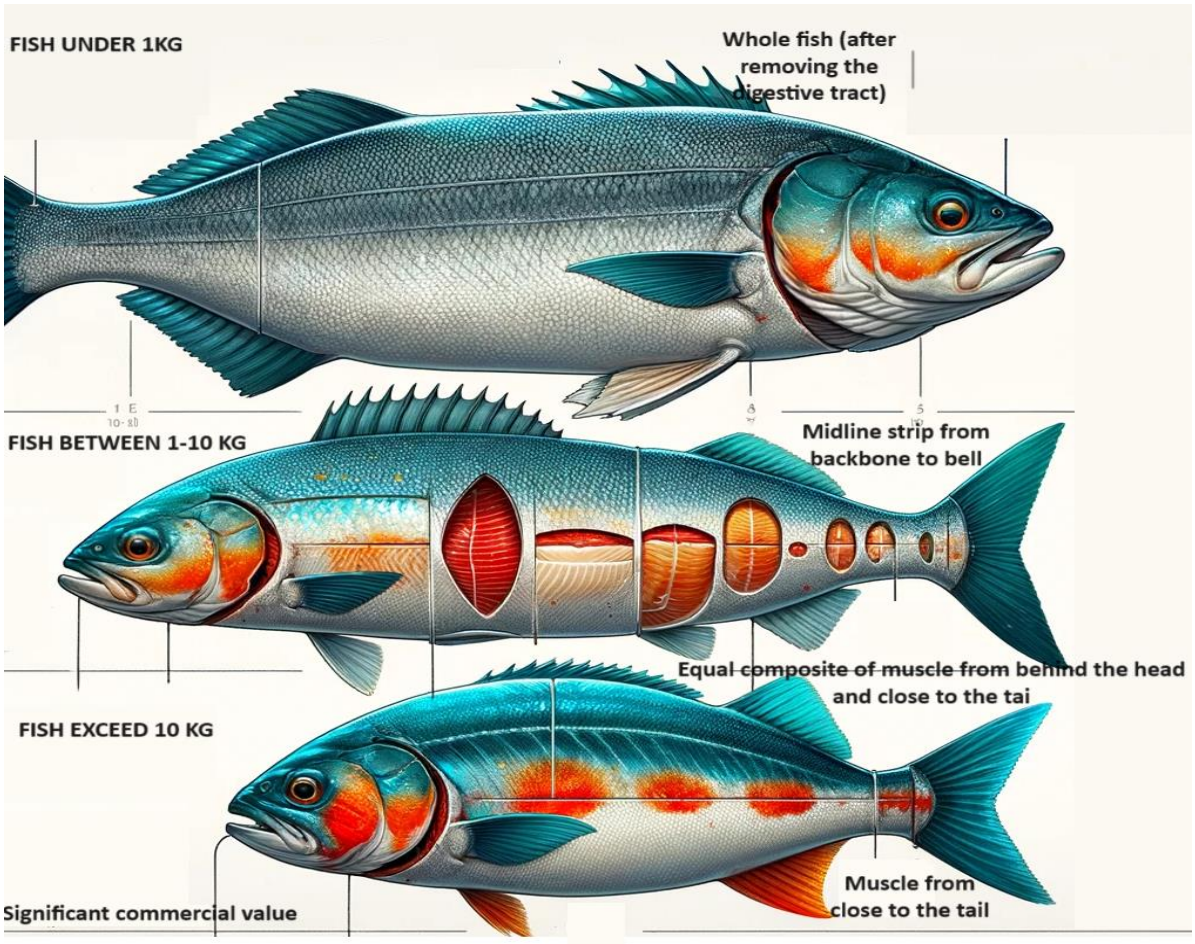

Figure 2: Tissue area the incremental sample is taken from for whole fish based on weight classes.

The document also addresses reconditioning of lots/sub-lots based on methylmercury levels to ensure compliance with safety standards.

Comments and Considerations

- Seven member countries or organizations (Canada, Egypt, European Union, Japan, Peru, Saudi Arabia and Thailand) responded to the Circular Letter (2022/47-CF) which called for information on national sampling plans.
- Four members (Brazil, Canada, Japan and the United States) provided comments on the proposed sampling plan. All four EWG members considered the sampling plan acceptable.
- Existing information is available only for certain tuna species.
- EWG members were requested to provide information to determine appropriate size classes.
- No information on the typical size ranges of commercially harvested fish for which Codex MLs exist were provided.
- One member provided a link to seafood handling guidelines which included a size grading schedule for all major species (Sydney Fish Market Pty Ltd, 2015). In this grading schedule (**Figure 3**), the following species have size ranges allocated for extra small, small, medium, large extra-large and extra extra-large; measured at total fish length, centimeters (cm).

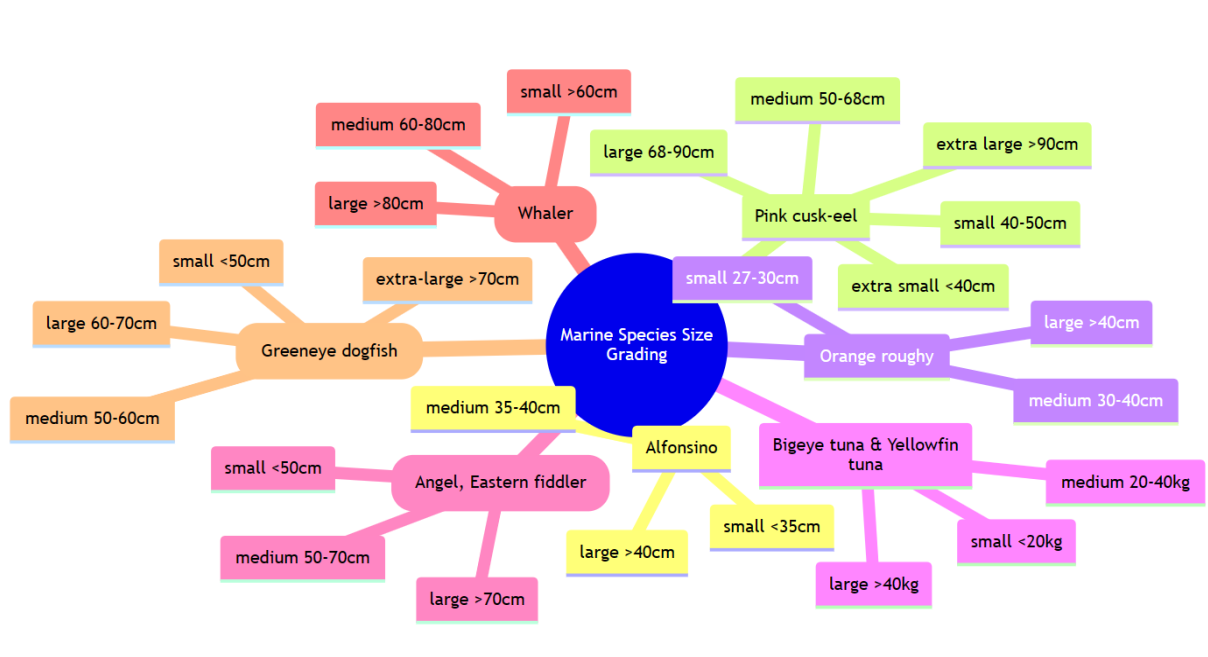

Figure 3: Size grading schedule for all major species (Sydney Fish Market Pty Ltd, 2015).

- The differences in sizes amongst the species/groupings for which MLs have been established are considerable and within groupings the variability in size may also be large. As a result of these differences, using a general sampling plan to encompass the four species/groupings of fish would therefore be difficult.
- No information was provided on the distribution of mercury laterally and from top (dorsal) to bottom (ventral) for the species of interest.
- Two options were presented for the EWG to consider in light of the information available to date:
  - **The first option** was to accept the current iteration of the sampling plan whilst noting to further revise the sampling plan in 4-5 years as new data becomes available;
  - **The second option** was to postpone development of the sampling plan for 4-5 years, given the issues on practicality, size and weight provisions for which data to refine further are not available.

Conclusion and Recommendations

- Arab Codex delegations may recommend introducing an additional classification within the 1 to 10 kg weight range in the sampling plan that can significantly enhance precision of methylmercury concentration measurements and the overall effectiveness of the sampling plan.
- Arab Codex delegations may consider supporting the adoption of the proposed sampling plan at Step 5/8 whilst noting that minor amendments are required for progressing the sampling plan further. In case significant technical challenges to implementation of the sampling plan are raised, Arab delegations may support the adoption at step 5 to allow time to address any remaining gaps.
- Arab Codex delegations may collaborate in sharing data and research findings on methylmercury levels in fish species prevalent in the Arab region particularly Tuna and Shark. However, Alfonsino, Marlin, Orange Roughy, and Pink Cusk-eel are not commonly associated with the Arab region's fisheries

C. Agenda item 7: Definition for ready-to-eat peanuts for the establishment of a maximum level for total aflatoxins in this product

Document Number: CX/CF 24/17/7

The CCCF17 is invited to:

- consider and agree on the proposed definition for RTE Peanuts (Appendix I) taking into account the discussions and rationale of the EWG;
- request the GEMS/Food administrator to issue a call AFT occurrence data in RTE peanuts; and
- re-establish the EWG, chaired by India, to further elaborate the ML for AFT in RTE peanuts as defined (in accordance with phase 2 of the work on MLs for AFT in RTE peanuts).

Background

- Since 2013, the Codex Committee on Contaminants in Food (CCCF) has been discussing the establishment of a ML for total aflatoxins (AFT) in ready-to-eat (RTE) peanuts, where total aflatoxins (AFT) refer to the sum of aflatoxins B1, B2, G1 and G2.
- At the **CCCF07 (2013)**, India presented a new work proposal for establishing a ML for AFT in RTE peanuts. An EWG was established led by India to prepare a discussion paper for consideration at CCCF08 (2014).
- **CCCF08 (2014)** considered the discussion paper and agreed to initiate a new work, re-establishing the EWG led by India to prepare a proposal for comments and considerations at CCCF09. CAC37 (2014) approved this new work.
- The EWG summarized the discussion and recommended a ML of 10 µg/kg, in line with comparable Codex MLs in tree nuts ("ready-to-eat"), for consideration by **CCCF09 (2015)**, which agreed to request from JECFA to conduct an exposure assessment to determine the health impact and to calculate potential rejection rates based on hypothetical MLs of 4, 8, 10 and 15 µg/kg AFT in RTE peanuts.
- **CCCF10 (2016)** recalled the decision to request a JECFA assessment and held the work on a ML proposal at Step 4 pending the outcome of the JECFA assessment.
- JECFA83 performed an assessment of hypothetical MLs 4, 8, 10 and 15 µg/kg of AFT in RTE peanuts and concluded that:
  - enforcing a ML of 10, 8 or 4 µg/kg in RTE peanuts **would have little further impact on reducing dietary exposure to aflatoxins** for the general population, compared with setting an ML of 15 µg/kg.
  - However, the proportion of the international market of RTE peanuts rejected at an ML of 4 µg/kg would be approximately double the proportion rejected at an ML of 15 µg/kg (about 20% versus 10%).
- The following **table 1** presents the summary of discussions and recommendations starting from 2017.

CCCF meeting (Year)	CCCF Discussions	CCCF Recommendations
CCCF11 (2017)	• **Revised proposal based on the outcome of JECFA83 of a ML of 15 µg/kg.** • Delegations opposed the proposal pointing out that there was no clear rationale for not maintaining the ML of 10 µg/kg (held at Step 4); rejection rates were not that different between the levels of 10 µg/kg and 15 µg/kg. • The proposed ML was the same as the ML for peanuts for further processing, knowing that further processing would reduce aflatoxin levels. • Proposal not in line with the ALARA principle. • The approach for peanuts would also not be consistent with the approach taken for the MLs for other nuts.	• Request comments on the levels of 10 µg/kg or 15 µg/kg at Step 3.

CCCF meeting (Year)	CCCF Discussions	CCCF Recommendations
	• The JECFA Secretariat noted that the Committee should take into consideration that the data underlying JECFA's impact assessment might have included a bias, **as the GEMS/Food database did not differentiate between peanuts for further processing and RTE peanuts**.	
CCCF12 (2018)	• To consider comments on the MLs of 10 and 15 µg/kg to prepare a revised proposal for consideration by the committee. • CCCF considered the proposal of 10 µg/kg for further discussion; however, no consensus was reached. • During discussion, a ML of 12 µg/kg was proposed but no consensus was reached.	• To hold the ML of 10 µg/kg at Step 4 to ensure implementation of the COP for the Prevention and Reduction of Aflatoxin Contamination in Peanuts (CXC 55-2004). • That JECFA would issue a call for data in three-years' time.
CCCF13 (2019)	• CCCF noted that this agenda item was not for discussion. The item had been included in the agenda to serve as a reminder that it was held at Step 4 pending further implementation on the COP.	#
CCCF14 (2021)	• The Codex Secretariat reminded CCCF that consideration of this item was suspended in 2018 to ensure implementation of the respective COP and to resume discussion in 3 years' time to reconsider the MLs based on new/additional data submitted to GEMS/Food.	#
CCCF15 (2022)	• Data analysis and recommendations for an ML of either 10 or 12 µg/kg for AFT in RTE peanuts as well as a recommendation to apply the same sampling plan for AFT in peanuts intended for further processing to RTE peanuts. • There was no segregated data in GEMS/Food between all peanuts and RTE peanuts. • Same views were discussed again: o A lower ML should be set than the one for peanuts intended for further processing. o The ALARA approach should be followed. o Lower MLs would result in high rejection rates (>5%)	• To return the ML and associated sampling plan to Step 2/3 for further consideration.
CCCF16 (2023)	• Data analysis suggested that 250 of the local food names, applicable to approximately 11 500 data points for AFT and 14 000 data points for AFB1, correspond to Ready-to-Eat (RTE) peanuts and could possibly serve with the ML setting process. • There was general agreement that work should continue developing MLs for AFT in RTE peanuts. However, comments were made requesting the precise definition of RTE peanuts.	• to prepare a proposal on a **clear definition for RTE peanuts** for the establishment of an ML for AFT in RTE peanuts and categorization of the occurrence data for consideration by CCCF17, working in close collaboration with the GEMS Administrator. • Following discussion and agreement on the definition for RTE peanuts at CCCF17 and working closely with the EWG on data analysis to propose an ML for RTE peanuts and associated sampling plans for consideration by CCCF18.

Analysis

The current definitions as stated in the GENERAL STANDARD FOR CONTAMINANTS AND TOXINS IN FOOD AND FEED / CXS 193-1995 amended in 2023 are:

- "**destined for further processing**" means intended to undergo an additional processing/treatment that has proven to reduce levels of aflatoxins before being used as an ingredient in foodstuffs, otherwise processed or offered for human consumption. Processes that have proven to reduce levels of aflatoxins are shelling, blanching followed by colour sorting, and sorting by specific gravity and colour (damage). There is some evidence that roasting reduces aflatoxins in pistachios but for other nuts the evidence is still to be supplied.

- "**ready-to-eat**" means "not intended to undergo an additional processing/treatment that has proven to reduce levels of aflatoxins before being used as ingredient in foodstuffs, otherwise processed or offered for human consumption.

The definition of RTE as adopted for the RTE tree nuts is based on the processing or treatments that could reduce the levels of aflatoxins, holding therefore ambiguities as for the classification of submitted data as RTE or not.

The new definition suggested by the EWG is the following:

Ready-to-Eat Peanut is a product intended for direct human consumption, not intended to undergo an additional processing/treatment that has proven to reduce levels of aflatoxins, before being used as ingredients in foodstuffs, otherwise processed, packed in all types of packaging such as consumer or bulk, labeled as 'RTE Peanuts'. It includes but is not restricted to (i) raw shelled peanuts, (ii) raw in-shell peanuts, (iii) roasted in-shell peanuts, (iv) roasted/blanched shelled peanuts, (v) fried shelled peanuts with or without skin, (vi) coated peanuts, (vii) seasoned peanuts, (viii) smoked peanuts, (ix) salted and cooked peanuts, (x) peanut butter.

The definition of Ready-to-Eat Peanuts is crucial in the process of ML setting, where data needs to be well segregated. As indicated in the working document, the EWG is recommending a new "Call for Data" from both (i) producer and (ii) importing countries on the occurrence of AFT for the clearly defined RTE Peanuts.

Conclusion and recommendations

- The proposed definition for ready-to-eat (RTE) peanuts is well aligned with the one previously adopted for RTE tree nuts, along with providing examples of products that could be classified as RTE peanuts, thus bringing an additional level of clarification that would help data providers and data handlers to ensure a clear segregation.
- The Arab Codex delegations may support the new proposed definition as it may enable to move forward with the establishment of an ML for AFT in RTE-peanuts, which constitute an important commodity for several Arab producing countries.

D. Agenda Item 9.1: Code of practice/guidelines for the prevention or reduction of ciguatera poisoning (At Step 4)

Document Number: **CX/CF 24/17/9**

Background

Ciguatera is a worldwide problem that is expanding due, among other reasons, to climate change. It became the most significant non-bacterial poisoning associated with fish consumption worldwide.

The term ciguatera identifies a poisoning syndrome caused by the ingestion of certain reef fish and shellfish from tropical and subtropical regions, especially South Pacific, Indian Ocean and the Caribbean. These fish and shellfish have accumulated certain toxins (ciguatoxins CTXx) through the food chain. Worldwide, Ciguatera fish poisoning (CP) is estimated to cause around 50 000 cases annually; neurological effects may last for weeks or even years and one percent of these cases are fatal[1].

These lipid-soluble toxins are produced by dinoflagellates of the genus *Gambierdiscus* and *Fukuyoa* (Vlamis and Katikou, 2014). Climate change and costal water over enrichment create an enabling environment for harmful algal blooms, which seem to have become more frequent, more intense and more widespread in the past decades (FAO/WHO, 2018).

Ciguatoxins enter the food chain through herbivorous marine fish and other marine organisms such as gastropods and bivalves that feed in marine reef environments and consume CTX-containing algae. Larger predatory fish accumulate toxins as they consume herbivorous fish, leading to bioaccumulation. Larger fish species or larger individuals in a population are not more likely to have accumulated CTX than smaller fish, as the diet of the fish plays a significant role.

Consuming CTX-contaminated fish was once limited to local residents and visitors in regions where toxic algae are known to accumulate in fish, but global trade of fish has caused CP illnesses to be reported by a wider range of countries.

At the CCFFP32 (2016), the Pacific Nations raised CP as an issue that is increasingly affecting the tropical and subtropical regions of the Pacific Ocean, Indian Ocean and Caribbean Sea between the latitudes of 35°N and 35°S.

At the CCCF11 (2017), the Committee agreed to request scientific advice from FAO/WHO to enable the development of appropriate risk management options, in particular: full evaluation of known CTXs (toxicological assessment and exposure assessment), including geographic distribution and rate of illness, congeners, and methods of detection and quantification; and guidance for the development of risk management options.

The report of the work conducted by the FAO/WHO expert meeting on ciguatera poisoning was presented during the meeting held in Rome November 2018[5].

Building on the above-mentioned report, FAO, in collaboration with IAEA and IOC-UNESCO, developed an e-learning course on monitoring and preventing CP designed for food safety and fishery authorities, policymakers, healthcare providers, and students[6].

Additionally to FAO/WHO, other intergovernmental bodies gave their support by forming organizations for the development of resources for monitoring CTXs and CP such as The IOC-UNESCO, The EuroCigua project, The North Pacific Marine Science Organization ("PICES") and The IAEA.

At the CCCF15 (**2022)**, CCCF agreed to establish an electronic Working Group (EWG) chaired by the United States and co-chaired by the European Union to prepare a discussion paper on the development of a code of practice or guidelines to prevent or reduce ciguatera poisoning taking into account the previous work done by FAO/IAEA. The aim of this discussion paper was to present the background issues, approaches to prevention or reduction, and knowledge gaps and future challenges associated with ciguatoxins and ciguatera poisoning.

At the CCCF16, delegates discussed the EWG's proposals related to the establishment of a possible future code of practice to prevent or avoid ciguatera poisoning, notably:

- The project document: proposal for a new work on a code of practice for the prevention or reduction of ciguatera poisoning.
- The outline for a future code of practice to prevent or avoid ciguatera poisoning.

CCCF16 agreed to:

- Start new work on a CoP/Guidelines for the prevention or reduction of ciguatera poisoning;
- Forward the project document to CAC46 for approval; and
- Establish an EWG, chaired by USA and co-chaired by France, Spain, and Panama, to prepare a proposed CoP/Guidelines for comments and consideration by CCCF17.

The 46th Session of the Codex Alimentarius Commission (**CAC46, 2023**) approved new work on a CoP/Guidelines for the prevention or reduction of ciguatera poisoning.

At CCCF17, delegates will discuss the EWG's proposals related to the establishment of future code of practice to prevent or avoid ciguatera poisoning

CCCF is invited to:

- Consider the CoP as set out in the EWG's report and to determine its readiness for advancement in the step procedure, and
- If not ready for advancement, to identify key issues that would need further consideration in order to progress with the finalization of the CoP, including the decisions mentioned in the report regarding some comments submitted by the members.

[5] Food and Agriculture Organization of the United Nations & World Health Organization. (2020). Report of the expert meeting on ciguatera poisoning: Rome, 19-23 November 2018. https://apps.who.int/iris/handle/10665/332640

[6] https://elearning.fao.org/course/view.php?id=648.

Analysis

Two drafts of the CoP were prepared by the EWG Chair along with the co-Chairs and submitted to delegates for comment.

The EWG was conducted via the Codex online forum and members were invited to contribute additional references and information that could be used in preparation of the document and to consider whether the document should be finalized as a CoP or guidelines.

According to the CCCF15 request, the EWG have considered all the aspects linked to CP issue and identified the main approaches for the prevention or reduction of the CP that might be established at different level such as:

- Governmental activities;
- Government-sponsored surveillance and monitoring programs;
- Fish sector operators;
- Analytical methods; and
- Data sharing and training.

A list of fish species known to bioaccumulate CTXs was included in the EWG report.

The principal questions reported by members and decisions made by EWG are:

- **The necessity to mention the genus Fukuyoa** (*as its contribution in CP is not completely understood*): There was general agreement that it is beneficial to retain mention of Fukuyoa in the CoP.
- **Using migratory patterns in the development of maps of toxic algae/fish**: A general statement that migratory information may be useful for complex maps was included.
- **The mention of details about analytical methods**: There was general agreement that a list of specific methods should not be included, but that the CoP could mention some types of methods that are applicable to CTX testing and refer to the methods presented in the 2020 FAO/WHO Report of the Expert Meeting on Ciguatera Poisoning.
- **Ideas about human activity that may impact prevalence of CP**: There was general agreement that the CoP could include a general statement that government officials could determine if changes to ecosystems are contributing to an increase in Gambierdiscus or Fukuyoa blooms or CTX-contaminated fish, and if steps can be taken to decrease these effects.
- **Discussion about whether a list of marine organisms known or suspected to be associated with CP should be included in the CoP** (*given that it is not exhaustive, it would be included for example purposes only, and may become out of date. In addition, it is not common for Annexes to be included in Codex CoP documents*): There was general agreement in the EWG that the Annex would be helpful and should be retained if possible.

Therefore, the EWG concluded that:

- A CoP would be appropriate for the work;
- The CoP should include a list of marine organisms known or suspected to be associated with CP, as well as a mention of general types of methods that are applicable to CTX testing, rather than a list of specific analytical methods.

CONCLUSION AND RECOMMENDATIONS

Ciguatera poisoning is supposed to be the most common type of marine biotoxin food poisoning worldwide. Currently, due to climate change and global trade of fish, CP illnesses seem to be of concern for a wider range of countries and are not limited anymore to the regions where toxic algae are known to accumulate in fish.

To prevent or avoid CP, the EWG have identified the possible topics for inclusion in the CoP and the main management measures to be developed to mitigate the risk of CP. All the aspects linked to this issue were discussed and mentioned in the CoP.

The Arab Codex delegations might give their support for advancing the work on the establishment of a CoP related to CP in the Codex steps procedure and the inclusion of a list of marine organisms known or suspected to be associated with CP, as well as a mention of general types of methods that are applicable to CTX testing, rather than a list of specific analytical methods.

E. Agenda Item 13: Discussion paper on Lead and Cadmium in Quinoa

Document Number: CX/CF 24/17/13

The CCCF17 is invited to consider whether:

a. There is enough evidence indicating there is no need to establish MLs for lead and cadmium in quinoa;

or

b. There is enough evidence to either:

i. extend the MLs for cadmium and lead in cereal grains to quinoa; or

ii. establish separate MLs for cadmium and lead in quinoa, and if in the affirmative, which MLs proposed by the JECFA Secretariat would be most appropriate 0.1 mg/kg or 0.2 mg/kg;

or

c. Further investigation of the evidence for (i) the extension of the current MLs for cadmium and lead in cereal grains to include quinoa or (ii) the establishment of separate MLs for cadmium and lead in quinoa.

Background

- The existing maximum levels (MLs) for lead and cadmium in cereals in the General Standard for Contaminants in Food and Feed (CXS 193-1995) explicitly exclude quinoa.
- **CAC40 (2017)** requested that the CCCF consider including quinoa in the MLs for lead and cadmium in cereals in CXS 193.
- **CCCF12 (2018)** considered this request and noted that since quinoa was a pseudo-cereal and the growing conditions were different, it might be appropriate to consider quinoa separately.
- **CCCF13 (2019)** further considered this matter and agreed that the JECFA Secretariat would issue a call for data on occurrence data for cadmium and lead in quinoa through the GEMS/Food database.
- **CCCF14 (2020)** decided to postpone the discussion on MLs for cadmium and lead in quinoa for three years to allow data generation and submission to the GEMS/Food database.
- **CCCF16 (2023)** recalled the decision taken at CCCF14 and requested the JECFA Secretariat to review the paper presented at CCCF14 based on an analysis of the new data collected through a call for data on cadmium and lead in quinoa and quinoa-based products, including foods for infant and young children.
- The JECFA Secretariat issued a request for data on cadmium and lead in quinoa and quinoa-based products, including foods for infants and young children on 15 September 2023 with a deadline for submission of data on 15 December 2023.

Analysis of new data submitted to the GEMS/Food database

Occurrence Data

- Following the call for data, the JECFA Secretariat received through the GEMS/Food database, 529 results for quinoa products for lead and 516 results for cadmium (1045 data points in total).
- In this discussion paper, the data pertained to cereals and cereal-based products that contain only quinoa as such (grain, seed, flour) were considered.
- Submitted data for cadmium were from Argentina (15) Canada (n=138), Ecuador (n=6), EU (n=270), Peru (n=25), USA (61) and Singapore (n=1). Submitted data for lead were from Argentina (n=13), Brazil (n=2), Canada (n=158), Ecuador (n=13), EU (n=246) Peru (n=25), USA (n=77) and Singapore (n=1), showing a relatively fair geographical representativeness.
- According to the JECFA procedure, non-detected (ND) data were assumed to be equal to the LOD as per the Upper Bound (UB) scenario.
- The benchmark limit was the ML of 0.1 mg/kg set in the Codex standard for cereal grains as a whole commodity.

- **For Cadmium (Cd): in terms of trade, the impact of applying an ML of 0.1 mg/kg would be a rejection rate of 4.7% for quinoa at the global level while applying an ML of 0.2 mg/kg would have a lower rejection rate of 0.2%.**
- **For Lead (Pb): in terms of trade, the impact of applying an ML of 0.1 mg/kg would have an impact of 3.8% rejection rate while applying an ML of 0.2 mg/kg would have a rejection rate of 0.4% of quinoa at the global level.**

Consumption data

- Currently there is no food item related to quinoa consumption as such identified in the GEMS/Food classification in cluster diets.
- Limited data was acquired from the FAO/WHO Chronic Individual Food Consumption database (CIFOCOss).

Dietary Exposure estimates

- Results showed that enforcing a maximum limit of 0.1 or 0.2 mg/kg for quinoa would have little impact on dietary exposure to cadmium for the general population, compared with the current situation with no Codex ML.
- Same conclusion for lead where results showed that enforcing a maximum level of 0.1 or 0.2 mg/kg for quinoa would have little impact on dietary exposure to lead for the general population, compared with the current situation with no Codex ML.

Comments and Considerations

The analysis performed by the JECFA Secretariat indicates that, in terms of consumer protection and trade, enforcing a maximum level of 0.1 or 0.2 mg/kg for cadmium and lead in quinoa would have little impact on dietary exposure to cadmium and lead for the general population, compared with the current situation with no Codex ML, while the proportion of rejected quinoa would remain<5% with an ML of 0.1 mg/kg and eventually with 0.2 mg/kg.

Conclusion and recommendations

- The JECFA secretariat followed the previously agreed-on systematic approach based on the "as low as reasonably achievable" (ALARA) principle and on rejection rates of samples with a maximum cut-off at 5%.
- The discussion paper presents enough data-driven evidence to establish MLs for both cadmium and lead in quinoa, although further efforts might be deployed for the collection of additional consumption data specific to this commodity.
- The analysis performed by the JECFA indicates that MLs might not be needed for cadmium and lead in quinoa since minor improvements were noticed as for the reduction of dietary exposures to these heavy metals. Arab Codex delegations might not object on the proposed MLs of 0.1 mg/kg for lead and cadmium in quinoa (grain, seed and flour), although the need to develop an ML has not yet been attained.

F. Agenda Item 14: Discussion Paper on the Review of the Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Peanuts

Document Number: CX/CF 24/17/14

CCCF is invited to consider if there is sufficient information available on new mitigation measures to justify the revision of the Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Peanuts (CXC55-2004).

Background

- At JECFA49 (1998), the Joint FAO/WHO Expert Committee on Food Additives evaluated AFs (B1, B2, G1 and G2; AFT) and it was concluded that aflatoxins are human liver carcinogens with AFB1 as the most potent one. No tolerable daily intake was proposed since aflatoxins were considered genotoxic carcinogens. Thus, adoption of the ALARA (as low as reasonably achievable) principle was recommended to reduce the potential risk.

- At JECFA83 (2017), the Joint FAO/WHO Expert Committee on Food Additives re-evaluated toxicological data and dietary exposure to AFs and reaffirmed the conclusions of the 49th JECFA meeting (FAO/WHO, 1998).
- At CCCF16 (2023), the Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Peanuts (CXC 55-2004) was identified for possible review and agreed to establish an Electronic Working Group (EWG) chaired by Brazil to develop a discussion paper to explore whether there are new measures supporting revision of the code of practice (CoP).
- At CCCF16 (2023), the committee identified this CoP for revision as part of an overall work on the review of Codex standards for contaminants, knowing that there is already a maximum level (ML) of 15 µg/kg for peanuts for further processing adopted by the Codex Alimentarius Commission (CAC) and a proposed ML for ready-to-eat (RTE) peanuts under consideration by CCCF.

Analysis

- The CoP includes recommended practices for aflatoxin reduction at pre-harvest, harvest, transport, storage, and manufacturing stages.
- The proposed revision of the Code of Practice (CoP) for aflatoxin management in peanuts aims to incorporate recent scientific data and effective risk management measures applicable worldwide. This initiative seeks to reduce aflatoxin contamination, addressing aflatoxigenic species identification and critical stages of peanut growth where contamination risks are heightened. Key considerations include:
  - **Consumer Protection**: Updating the CoP will enhance health protection and prevent fraudulent practices by reducing aflatoxin exposure in peanuts.
  - **International Trade**: A revised CoP will harmonize practices across nations, assisting exporters in meeting aflatoxin levels and facilitating global trade by addressing diversification in national legislations and potential trade barriers.
  - **Scope and Priorities:** Prioritization of effective, globally applicable practices for the inclusion in the CoP to prevent and reduce aflatoxin contamination in peanuts is essential.
  - **Previous International Work:** The work builds on JECFA assessments and integrates with existing efforts by other international organizations.
  - **Codex Strategic Goals and Existing Documents**: Highlights the CoP's alignment with Codex's strategic objectives and the CoP is important to support the implementation or development of MLs for aflatoxins contamination in peanuts.
- In the discussion paper for the review of the Code of Practice for the Prevention and Reduction of Aflatoxin Contamination in Peanuts, it's noted that the current CoP **lacks an introduction.** Therefore, there's a need to incorporate an introductory section. This introduction should provide essential information on aflatoxins in peanuts, highlighting the primary aflatoxigenic species involved in peanut contamination.
- The updated CoP for aflatoxin management in peanuts emphasizes a holistic approach combining Good Agricultural Practices (GAP) and Good Manufacturing Practice (GMP), alongside potential future management systems:

Pre-harvest (GAP):

- **Soil Management:** Updates include reviewing soil amendments to lower *A. flavus* seed infection and aflatoxin formation.
- **Water Management:** Expanded information on how water stress influences fungal growth and the critical growth period for drought stress, particularly during pod/seed filling, highlighting the necessity for tailored water management practices.
- **Biological Control:** Introduces biological control methods as an effective strategy to mitigate aflatoxin contamination.

Harvest:

- A visual guide has been added to clarify the stages of peanut reproductive growth, aiding in the identification of key periods vulnerable to aflatoxin contamination.

Manufacturing (GMP):

- **Sorting:** Enhancements in sorting practices, including color sorting, density flotation, blanching, and roasting, are detailed as methods to reduce aflatoxin levels.
- **Blanching:** Provides an in-depth look at the blanching process and its effectiveness in aflatoxin reduction**.**

Future Management Systems:

- The CoP outlines a vision for integrating complementary management systems, with clarifications and examples to illustrate practical applications.
- A synthesis of critical farm practices and major GMP measures within shelling plants is included, serving as a summary of essential actions for aflatoxin control.

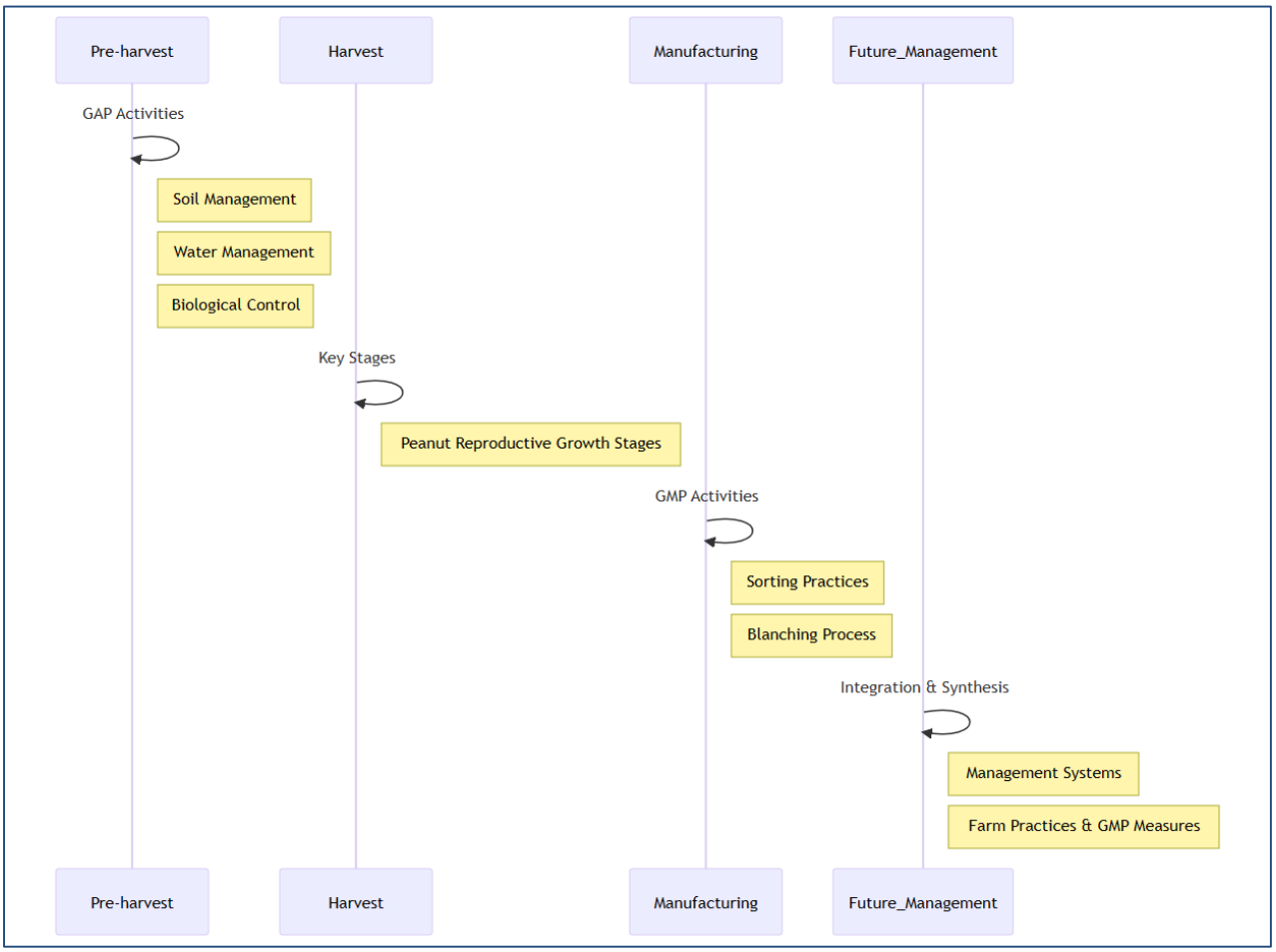

Figure 1: Code of Practice (CoP) for aflatoxin management in peanuts

The main changes proposed for the CoP for the Prevention and Reduction of Aflatoxin Contamination in Peanuts consist of:

Pre-harvest Good Agricultural Practices (GAP):

- Added information to review the use of soil amendments to reduce *A. flavus* seed infection and aflatoxin formation.
- New insights on the impact of water stress on fungal growth.
- Clarification on the critical period of crop growth for drought stress, particularly during pod/seed filling.
- Inclusion of biological control methods as a mitigation strategy for aflatoxin contamination.

Harvest:

- Incorporation of an illustration to explain the stages of peanut reproductive growth.

Transport to Processing Facilities:

- Ensuring clean, dry, and free of infestation transport conditions.
- Protection of consignments from additional moisture and temperature fluctuations.

Segregation of Aflatoxin Contaminated Lots:

- Implementation of sorting and testing to identify and segregate aflatoxin-contaminated peanuts for appropriate handling.

Storage**:**

- Emphasis on conditions that minimize mold growth and aflatoxin production, such as maintaining low moisture content and temperature.
- Monitoring of aflatoxin levels in peanuts entering and leaving storage facilities.

Good Manufacturing Practice (GMP):

- Sorting: Addition of sorting practices such as color sorting, density flotation, blanching, and roasting to reduce aflatoxin levels.
- Blanching: Enhanced details about the blanching process and its effectiveness in reducing aflatoxins.

Future Considerations:

- Clarification of text and addition of examples to illustrate practices.
- Summary of important good farm practices and major GMP measures in the shelling plant included.

Conclusion and recommendations

- The Arab codex delegations might support the recommendations of the EWG to update the CoP with new scientific data and effective measures for aflatoxin management in peanuts, reflecting advancements in research and current applications across regions.

G. Agenda Item 15: Discussion Paper on Review of the Code of Practice for the Reduction of Aflatoxin B1 in Raw Materials and Supplemental Feedingstuffs for Milk-producing Animals

Document Number: **CX/CF 24/17/15**

The CCCF17 is invited to consider:

i. The review and updating of the Code of Practice CXC 45-1997, concerning aflatoxin B1 reduction in feeds for milk-producing animals,

ii. The comprehensive information presented for enhancing the CoP.

Background

- **CCCF13 (2019)** agreed to establish an electronic working group (EWG) chaired by Canada and co-chaired by Japan and the United States of America to develop an approach for reviewing existing Codex standards and related texts developed by the CCCF.
- **CCCF14 (2021)** agreed to establish tracking lists of Codex standards, an approach and prioritization criteria for recommending existing Codex contaminant standards and related texts for review, and to implement this approach for a three-year trial period (2022-24).

- **CCCF15 (2022)** agreed to maintain, without further prioritization, tracking Lists A and B and to create an **Overall Highest Priority List** of Codex Standards and related texts for Contaminants in Food and Feed (the "OHPL").
- **CCCF16 (2023)** agreed to establish an electronic working group (EWG) chaired by Canada to develop a discussion paper on the review of the Code of practice for the reduction of aflatoxin B1 in raw materials and supplemental feedingstuffs for milk-producing animals (CXC 45-1997).

Analysis

- The Prioritization criteria cited by member countries or organizations in the OHPL in support of the possible review of the Code of practice for the reduction of aflatoxin B1 in raw materials and supplemental feeding stuffs for milk-producing animals (CXC 45-1997) underscores several key points that highlight the necessity and urgency of reviewing and potentially updating this CoP:
  - **Outdated Code of Practice**
    - **Established:** 1997
    - **Status:** Not reviewed or modified since inception
  - **Health Concerns**
    - **Issue**: No Health-Based Guidance Value (HBGV) established
    - **Reason:** Aflatoxin's genotoxicity and carcinogenicity
  - **Staple Food Impact**
    - **Commodity**: Animal-derived milk
    - **Significance**: Staple food worldwide, including developing countries
  - **Need for Review**
    - **Comparable CoP Updates:** Other standards updated without parallel review of CXC 45-1997
    - **Member Country Initiative**: Canada volunteered to lead revision work
- This discussion paper aims to:
  i. Summarize the additional information available on practices for reducing aflatoxins in the feedingstuffs of milk-producing animals that have become available since CXC 45-1997 was elaborated in 1997;
  ii. Identify other revisions that would improve CXC 45-1997, if updated; and
  iii. Highlight areas of redundancy with other Codex CoPs on aflatoxin prevention and control.
- New updates to CXC 45-1997 aim to enhance clarity, broaden the scope to include non-cereal feeds, and integrate recet aflatoxin mitigation strategies, reflecting the latest scientific advances. These revisions will clarify the CoP's scope, assess the relevance of key terms, and utilize definitions from Codex, FAO, WHO, or others agreed upon by the Electronic Working Group (EWG). Additionally, the updates will address the historical oversight of aflatoxin contamination in non-cereal feeds, introducing pertinent new information for incorporation, as outlined in **Table 1**.

Table 1: The main proposed updates to CXC 45-1997.

Update Category	Details
Scope and Definitions	- Clarification and definition of 'raw materials' and 'supplemental feedingstuffs' using Codex, FAO, WHO definitions or others agreed upon. - Expansion to include non-cereal feeds.
Aflatoxin Contamination	- Acknowledgment of aflatoxin detection in non-cereal feedingstuffs (hay, forage, soybeans, alfalfa, clover, and silage).
New Information and Strategies	- Enhanced storage practices to mitigate aflatoxin formation in silage. - Use of mold inhibitors and preservatives post-harvest. - Introduction of emerging and novel mycotoxin mitigation strategies across the value chain. - Updates on "mycotoxin detoxifying agents" for reducing mycotoxin contamination.
Feed and Ingredient Sourcing	- Consideration of aflatoxin contamination risks in food industry by-products. - Strategies for managing feeds intentionally diverted from human to animal food chain due to aflatoxin levels.
Background Information Updates	- Addition of information on milk-producing animals, feedingstuffs prone to aflatoxin contamination, and aflatoxin M1 formation mechanism. - Reference to good animal feeding practices and definitions from the Code of Practice on Good Animal Feeding (CXC 54-2004; 2008).
High-Level Background Updates	- Relevance of “FAO recommendations for sampling plans. - New insights on the transformation and transfer rates of aflatoxin B1 to M1 in milk. - Review of how the relative toxicity of aflatoxin M1 compared to B1 is described.

❖ The proposed updates to the Code of Practice for reducing aflatoxin B1, highlighting the purpose, relevance, main aspects to be covered, alignment with Codex priorities, relationships with other documents, and the projected timeline for the work as presented in **Table 2** below.

Table 2: Project Proposal for Revising CXC 45-1997: Reducing Aflatoxin B1 in Animal Feed.

Section	Details
Purpose & Scope	- Update guidance for member countries and the feed industry on reducing aflatoxin B1 in feeds for milk-producing animals. Focus on incorporating new aflatoxin management strategies since the CoP's 1997 elaboration.
Relevance & Timelines	- Highlights the unchanged status of CXC 45-1997 since 1997 despite new information and JECFA's classification of aflatoxin M1 as a genotoxic carcinogen in 2002. - Proposes updates to support global reliance on animal-derived milk products, with work commencing in 2024 and aiming for a 2027 completion.
Main Aspects to be Covered	- Includes preventing/reducing aflatoxin B1 in feed, specific management approaches (e.g., for silage), mycotoxin detoxifying agents, and leveraging information from other Codex CoPs (CXC 51-2003, CXC 59-2005, CXC 55-2004) to reduce redundancies.
Criteria for Work Priorities	- Addresses consumer protection, fair trade practices, diversification of national legislations, and contributions to international trade. - Supports Codex strategic goals on current issues, science-based standards, impact enhancement, member participation, and efficient work management.
Codex Document Relationship	- Aims to support the Codex maximum level for aflatoxin M1 in milks, considering updates in related CoPs on mycotoxins in cereals, tree nuts, and peanuts to avoid redundancy.
Scientific & Technical Input	- Based on JECFA's 2002 risk assessment with no current need for additional advice. - No need for input from external bodies at this stage.
Proposed Timeline	- Targeting to start in 2024, with the first draft for CCCF18 in 2025, and completion anticipated by 2027. The work will address potential redundancies with related CoPs.

- The EWG was convened using the Codex online forum. As a first step, EWG members were invited to contribute information on control measures for aflatoxins in feeds intended for milk-producing animals. Subsequently, the EWG was engaged in two rounds of comments, detailed in **Tables 3 and 4 below**.

Table 3: Comments and responses on the first draft discussion paper.

Aspect	Details
EWG Members' Comments	Six (6) members submitted comments: Brazil, Canada, Costa Rica, Denmark, Japan, United States.
Document Commented On	First discussion paper.
Content of Discussion Paper	Outlined new information on aflatoxin reduction strategies and potential updates to background information.
Relation to CXC 51-2003	Noted that CXC 45-1997's primary informational text is included and expanded upon in CXC 51-2003, which addresses mycotoxin contamination in cereals (amended 2014, 2017; revised 2016).
Scope of CXC 51-2003	Applies to cereal grains for both human and animal consumption. Input was requested on its applicability to non-cereal animal feeds of agricultural origin.
EWG Chair Requests	Sought input on merging CXC 45-1997 with CXC 51-2003 or maintaining them as separate CoPs.
Charge Questions	i. Is there new information warranting the revision of CXC 45-1997? ii. Can the majority of CXC 51-2003 apply to non-cereal feedingstuffs of agricultural origin used as animal feed? iii. Should CXC 45-1997 remain separate or be merged with CXC 51-2003?
EWG's Response to Charge Questions	i. Agreed on new work to revise CXC 45-1997 ii. Agreed CXC 51-2003 mostly applies to non-cereal animal feedingstuffs iii. Varying opinions on whether to keep CXC 45-1997 separate or merge it with CXC 51-2003.

Table 4: Comments on the second draft discussion paper.

Aspect	Details
EWG Members' Comments	Two (2) EWG members commented.
Documents Commented On	Second discussion paper and project document for CAC.
Purpose of Comments	To forward to the Codex Alimentarius Commission (CAC) if approved by CCCF17.
Nature of Comments	No substantial comments received.
Response to Recommendations	Member countries supported the EWG's proposed recommendations to CCCF17.

Conclusion and recommendations

- The Arab Codex delegations might support this proposal, which will encompass updated information, incorporating recent scientific insights and practices.
- The Arab Codex delegations may support the expansion of the CoP's scope to include non-cereal feeds, thereby covering all sources of aflatoxin contamination.

The Arab Codex delegations may emphasize the importance of clarifying definitions and terminology through standardized references to enhance understanding and implementation

G. Agenda Item 16.1: Development of a Code of practice for the prevention and reduction of cadmium contamination in foods

Document Number: **CX/CF 24/17/16**

CCCF is invited to consider if there is sufficient information available on cadmium sources and mitigation measures, based on the information provided, to recommend development of a Code of Practice for the Prevention and Reduction of Cadmium Contamination in Foods.

If CCCF agrees to develop the code of practice (CoP), to consider the need for development of annexes to a CoP that could contain commodity-specific recommendations, similar to the Code of Practice for the Prevention and Reduction of Mycotoxin Contamination in Cereals (CXC 51-2003).

If CCCF supports use of annexes:

- to advise on whether the recently completed Code of Practice for the Prevention and Reduction of Cadmium Contamination in Cocoa Beans should be maintained as a separate document or adapted as an annex.
- to indicate if there is any adjustment that would be needed to the approach outlined in Appendix III, in order to support the use of commodity-specific annexes.

Background

- JECFA77 (2013) assessed dietary exposure to cadmium from cocoa and cocoa products following a request arising from the 6th Session of the Codex Committee on Contaminants in Foods (CCCF6, 2012). JECFA estimated total dietary cadmium exposure as 30-69% of the provisional tolerable monthly intake (PTMI) for adults and 96% for children aged 0.5-12 years. JECFA noted that these percentages were likely overestimates of total dietary cadmium exposure, as the estimates from the whole diet also included the contribution from cocoa and cocoa products**.**
- JECFA91 (2021) conducted a new exposure assessment that included the contribution of cadmium from all food sources, in particular cocoa products. This assessment was based on more comprehensive occurrence data, including a wider geographical range of occurrence data in cocoa products. JECFA concluded that the major contributors to dietary cadmium exposure were cereals and cereal products, vegetables, and seafood, while the contribution of cocoa products to dietary cadmium exposure was minor (0.1-9.4%).
- CCCF15 (2022) adopted maximum levels (MLs) for cadmium in chocolate containing or declaring < 70%, and ≥ 70% total cocoa solids, and 100% cocoa powder, as well as the Code of Practice for the Prevention and Reduction of Cadmium Contamination in Cocoa Beans.
- (CCCF16, 2023) agreed that the United States of America (USA) would prepare a discussion paper on a possible Code of Practice (CoP) for the Prevention and Reduction of Cadmium Contamination in Foods for consideration by the CCCF17.
- The development of the discussion paper follows from recommendations from USA, the European Union (EU) and Japan in response to CL 2022/85-CF on the Review of Codex Standards for Contaminants, that a CoP should be considered prior to review/revision of cadmium maximum levels (MLs).

Analysis

- The new work aims to reduce exposures that may cause exceedance of the PTMI, through the development of a CoP that covers cadmium contamination in a range of foods in addition to cocoa beans.
- The purpose of the proposed new work is to develop a CoP to prevent or reduce cadmium contamination in foods. The scope of the work encompasses reduction of cadmium contamination during agricultural and aquacultural production and food processing, preparation, packaging, and transport.
- USA reviewed available literature on risk management practices to prevent or reduce cadmium contamination in foods as well as information provided by a limited number of Codex members (Canada, Japan, New Zealand, and Peru) who led the development of the CoP to prevent and reduce cadmium contamination in cocoa beans, that can constitute the basis

for this new work.

- The main criteria for setting work priorities are designed to:
  - **Consumer Protection**: Aimed at reducing cadmium exposure to safeguard consumer health and combat fraud.
  - **International Trade**: The CoP seeks to align laws globally and support exporters to comply with cadmium limits, thus easing trade restrictions.
  - **Scope and priorities**: Encompasses the entire food production chain, including agriculture and transport, to ensure thorough cadmium reduction.
  - **Previous International Work**: Leverages existing WHO guidelines and more, laying a solid groundwork for the CoP.
  - **Codex Strategic Goals and Existing Documents**: Highlights the CoP's alignment with Codex's strategic objectives and the necessity for an expanded CoP due to pre-existing food cadmium standards.
- The proposed CoP presents a thorough strategy for managing and reducing cadmium exposure from food through a blend of agricultural, manufacturing, regulatory, and consumer-focused approaches, detailing:
  - **Cadmium Sources and Exposure:** Emphasizes the diverse sources of cadmium, both natural and anthropogenic, and its detection in various foods as evaluated by the Joint FAO/WHO Expert Committee on Food Additives (JECFA).
  - **Codex Committee's Cadmium Regulation Efforts:** Highlights the Codex Committee on Contaminants in Foods (CCCF)'s initiatives to establish maximum allowable concentrations (MLs) of cadmium in food products and the development of specific Codes of Practice for items like cocoa beans.
  - **Recommended Practices**: Outlines comprehensive recommendations based on Good Agricultural Practices (GAP) and Good Manufacturing Practices (GMP) for reducing cadmium contamination, including soil management and water chemistry, crop selection for lower cadmium uptake, fertilizer and manure management, soil pH adjustment, and management of livestock and seafood to reduce cadmium levels.
  - **Food Processing and Consumer Practices:** Provides guidance on food processing methods to lower cadmium exposure, such as selecting ingredients carefully, washing and peeling vegetables and fruits, and milling grains to eliminate cadmium-rich layers. Highlights consumer actions to decrease cadmium exposure, including thorough washing of produce and public education on the risks associated with certain local and wild foods.
  - **Production and Use of Packaging and Storage Products:** Advises minimizing cadmium exposure through careful selection and regulation of food packaging and storage materials, avoiding cadmium-glazed ceramics, labeling items not intended for food use, setting standards for cadmium migration, implementing supply chain controls, and ensuring products for children adhere to low cadmium standards to safeguard food safety.

Conclusion and recommendations

- The Arab Codex delegations might support the development of a CoP to prevent or reduce cadmium contamination in foods, considering that there is sufficient information available on cadmium sources and mitigation measures.
- The Arab Codex delegations may support the development of annexes that would contain commodity-specific recommendations, potentially enclosing the CoP for the Prevention and Reduction of Cadmium Contamination in Cocoa Beans. However, additional discussions and a call for comments may further clarify this point.