ANALYSIS OF AGENDA ITEMS AND PREPARATION FOR THE 15th SESSION OF THE CODEX COMMITTEE ON CONTAMINANTS IN FOOD

9th – 13th and 24th MAY 2022 Virtual Meeting

AGENDA ITEM 16

Review of methods of analysis for contaminants

Objectives

This document offers a review and analysis of the agenda items planned for discussion at the 15th session of the Codex Committee on Contaminants in Food (CCCF), scheduled to take place virtually from May 9th– 13th and 24th, 2021. The document is intended for possible use by the Codex communities of practice promoted by GFoRSS and PARERA, as part of their contribution to enhancing awareness and supporting effective participation in international food standard setting meetings (Codex meetings) by representatives from members and observers.

The analysis provided in this document offers a factual review of agenda items, their background and a discussion of some considerations. This analysis is indicative in nature and does not represent an official position of the organizations mentioned above (PARERA and GFoRSS), their membership or their management. It provides a synthesis and analysis of the work currently under discussion in the CCCF committee, which may be useful for delegations from Arab countries to prepare their positions taking into account the needs and specificity of the region and potential impact of the proposed food standards.

This analysis is prepared as part of the **Codex Initiative for the Arab region : Arab *Codex Initiative***, implemented by PARERA and GFoRSS, hosted and coordinated by the Arab Industrial Development, Standardization and Mining Organization (AIDSMO) and funded by the US Codex Office, US Department of Agriculture.

The focus of the analysis of agenda item 16 of CCCF15, relates to the review of methods of analysis for contaminants, particularly lead (Pb) and cadmium (Cd) in different food commodities.

**It is important to note that experts – members of the Expert Working Group (EWG) – do not represent the organizations and / or jurisdictions to which they are affiliated. The selection and participation in the EWG 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.*

Agenda Item 16: Review of methods of analysis for contaminants

Documents

- *CX/CF 22/15/15*

Background

At the CCCF14 (**May 2021)**, The CCCF agreed:

i) To review the methods in the Standard for General Methods of Analysis for Contaminants (CXS 228-2001) with the view to transfer them to the General Standard for Recommended Methods of Analysis and Sampling (CXS 234-1999) if applicable, and subsequent revocation of the CXS 2282.

ii) That Brazil with the assistance of the United States of America and Japan would review the methods in the General Standard for Methods of Analysis for Contaminants (CXS 228-2001) with the aim of assessing their appropriateness or replacement by other more appropriate methods and possible conversion to performance criteria for consideration by CCCF15 (2022).

At the CCCF15, the committee will examine the proposal submitted by the working group represented by Brazil with the assistance of the United States of America and Japan, concerning the review of the method of analysis for contaminants. The work focused only on methods related to compounds in CXS 228-2001 that fall within the definition of contaminant.

Analysis

The **table 1** presents the six methods that have been identified by the working group as meeting the definition of methods for contaminants for the purposes of these works:

Table 1: Methods of analysis for contaminants in CXS 228 that fall within the definition of contaminant in CXS 193

FOOD	Disposition	Method	Principle	Type
All foods (Except fats and oils)	Lead and cadmium	NMKL 139 (1991) AOAC 999.11	AAS after dry ashing	II
All foods (Except fats and oils)	Lead and Cadmium	NMKL 161 (1998) AOAC 999.10	AAS after microwave digestion	III
All foods	Cadmium	AOAC 986.15	Anodic stripping voltametry	III
All foods	Lead	AOAC 972.25	AAS	III
All foods (Except fats and oils)	Lead	AOAC982.23	Anodic stripping voltametry	III
All foods	Lead	AOAC986.15	Anodic stripping voltametry	III

Considering the definition of contaminant in the General Standard for Contaminants and Toxins in Food and Feed (CXS 193-1995), the methods for copper, iron and zinc, which are considered quality factors in CXS 228, were not considered.

The analytical methods in Table 1 have been reviewed and the applicable ranges for lead and cadmium from these methods were identified as summarized in **Table 2**.

Table 2: Applicable range of the analytical methods listed in the CXS 228-2001

Reference methods	Applicable range for Pb (mg/kg)	Applicable range for Cd (mg/kg)
NMKL 139 (1991) AOAC 999.11	≥0.04	≥0.05
NMKL 161 (1998) AOAC 999.10	≥0.1	≥0.01
AOAC 986.15	NA	NA
AOAC 972.25	≥0.3	NA
AOAC 982.23	≥0.010	≥0.005

NA: information not available from method standard.

The performance criteria for lead and cadmium have been calculated and presented as recommendation in **appendix 1** of the working document **(**CX/CF 22/15/15)**,** taking into account, the maximum limits established for each product in the CXS 193 standard and the guidance for establishing numerical values for the criteria selected from Codex Alimentarius Commission Procedural Manual.

Comments and observation of the working group

The use of the identified methods may not be appropriate considering the compliance with ML for lead revised recently and there is no evidence that they are applicable to all foods for which MLs are currently established in Codex although they are listed in the CXS 228 as applicable to all foods.

The criteria mentioned in the Codex Alimentarius Commission Procedural Manual are applicable to fully validated methods, with the exception of methods such as PCR (polymerase chain reaction) and ELISA (enzyme immunoassays), which require a different set of criteria.

It would be desirable for CCCF to consider developing and including method criteria in CXS 234, rather than including reference analytical methods the selected contaminants in food which is in compliance with the decision of the Codex Committee on Methods of Analysis and Sampling, at its 41st Session (CCMAS) (2021) to develop numerical performance criteria for methods for the determination of lead in butter, products casein-based edibles and whey powders (secondary dairy products) (and such adopted by the forty-fourth session of the Commission) with the intention of revoking the methods published for lead in these products in CXS 234. Then, CCMAS will continue to review the methods for lead in these products at its next session, to determine whether these should be included as examples of methods that meet the numerical criteria.

Although performance criteria for lead and cadmium in natural mineral waters are already listed in CXS 234, it was observed that the values are not in accordance with the guidelines of the Procedure Manual, particularly those relating to accuracy. Therefore, Appendix I of the working document (CX/CF 22/15/15) includes performance criteria for lead and cadmium in waters natural minerals.

Recommendation of the working group

At the CCCF15, the Committee has to take decisions on the following propositions:

- Review the performance criteria listed in Appendix I of the working document (CX/CF 22/15/15) for lead and cadmium, and decide whether the table should be submitted for consideration by CCMAS for inclusion in the General Standard for Recommended Methods of Analysis and Sampling (CXS 234-1999).
- Consider recommending to CCMAS the revocation of the Standard for General Methods of Analysis contaminants (CXS 228-2001), including methods for copper, iron and zinc, given that analytical methods for these metals in foods are already included in CXS 234.
- Consider asking CCMAS to:
    - Remove from CXS 234 the analytical methods listed in Appendix II for lead; and
    - Move these methods to the "example of applicable methods that meet the criteria" column in Appendix I, if they met the established performance criteria.
- Request CCMAS to identify and suggest examples of applicable analytical methods that meet the performance criteria in Appendix I.
- Request CCMAS to assess the suitability of replacing the existing performance criteria in the CXS 234 standard for lead and cadmium in natural mineral waters in accordance with Appendix I.

Conclusion and considerations for the region

The proposed working document seems to follow the standard codex procedures related to the establishment of analytical methods for contaminants determination in food. Therefore, Arab delegations may consider supporting the adoption of the performance criteria as listed in appendix I of the document CX/CF 22/15/15 as well as the request to CCMAS to identify and suggest analytical methods that meet these performance criteria.