

INTRODUCTION

1. The Codex Committee on Methods of Analysis and Sampling (CCMAS) held its 45th session in Budapest, Hungary, from 9 to 13 March 2026, at the kind invitation of the Government of Hungary. The Session was chaired by Dr Attila Nagy, Director, National Food Chain Safety Office (NFCSO) and Dr Zsuzsa Farkas, Head of Department, Department of Digital Food Science, University of Veterinary Medicine, Budapest acted as the Vice-Chairperson. The Session was attended by ** Member countries, one Member organization and ** Observer organizations. The list of participants is contained in Appendix I.

OPENING OF THE SESSION

2. Dr Imre Nemes, President, NFCSO, opened the session and extended his warmest welcome to all participants. Dr Nemes highlighted the importance of ensuring scientific soundness, transparency and international cooperation in Codex, noting that Codex standards were critical for global trade, helped to promote consumer confidence in food safety and quality and served as the basis for legislation on food safety and quality in many countries. Dr Nemes also noted that the interest among Members in CCMAS's work remained strong and that CCMAS' work was instrumental for the modernisation of food safety and laboratory systems.
3. Ms Mary Kenny, Food Safety and Consumer Protection Officer, the Food and Agriculture Organization of the United Nations (FAO) Regional Office for Europe and Central Asia, and Dr Jing Tian, Vice-Chairperson of the Codex Alimentarius Commission (CAC), also addressed the Committee.

Division of Competence

4. CCMAS45 noted the division of competence between the European Union and its Member States, according to paragraph 5, Rule II of the Procedure of the CAC.

ADOPTION OF THE AGENDA (Agenda item 1)¹

5. CCMAS45 adopted the provisional agenda as the agenda for the session and agreed to consider the following items under Agenda Item 10 (Other Business and Future Work), subject to the availability of time:
 - Work of the Joint FAO/IAEA Centre; and
 - Discussion paper on the development of methods of analysis for microplastics in food-grade salt (CRD05).

MATTERS REFERRED TO THE COMMITTEE BY THE CODEX ALIMENTARIUS COMMISSION AND OTHER SUBSIDIARY BODIES (Agenda item 2)²

6. The Codex Secretariat introduced the item and recalled that some matters from CAC48, the 88th and 89th Sessions of the Executive Committee of the Codex Alimentarius Commission (CCEXEC88 and CCEXEC89), the 18th Session of the Codex Committee on Contaminants in Food (CCCF18), the 23rd Session of the FAO/WHO Coordinating Committee for Asia (CCASIA23), the 12th Session of the FAO/WHO Coordinating Committee for Near East (CCNE12) and 8th Session of the Codex Committee on Spices and Culinary Herbs (CCSCH8) were for information purposes; and the following matters for action were considered by the virtual working group (VWG) meeting that met on 2 March 2026 and the physical working group (PWG) that met on 8-9 March 2026:
 - Reconsideration of the recommendation to revoke the method for salt saturation in salted fish and dried salted fish of the Gadidae family of fishes together with Appendix VIII (Part 1) of the *Recommended methods of analysis and sampling* (CXS 234-1999).
 - Review of example methods in certain numeric performance criteria (NPC) for salt and sodium.
 - Replies from CCSCH8 to questions from CCMAS43; and
 - Endorsement of methods of analysis for provisions in spices and culinary herbs standards.
7. CCMAS45 noted that CCEXEC89 had recommended that any additional resources be used for the development and update of all databases, including that for methods of analysis and sampling. The Codex Secretariat clarified that development and update of all databases were a priority for the Secretariat and that further technical information would be provided during a side event organised on the margins of this session with respect to the development of the database for methods of analysis.
8. Noting that CAC had acknowledged inconsistencies in nitrogen to protein conversion factors (Nx) that existed for soy products and that this could be addressed in the future, a Member sought clarification on how this could

¹ CX/MAS 26/45/1

² CX/MAS 26/45/2

be addressed as it had implications on consumer perceptions of food safety and quality. The Codex Secretariat recalled that the review of N_x values was the responsibility of commodity committees, but in cases where committees were adjourned *sine die*, a mechanism was still being developed to progress this work.

9. CCMAS45 noted that it was important for the Codex Committee on Milk and Milk Products (CCMMP) to engage early with CCMAS in its process of elaborating a commodity standard for pasteurised liquid camel milk, to ensure that the methods submitted for CCMAS' endorsement were validated.

Conclusion

10. CCMAS45:
 - i. noted the matters for information referred by CAC, CCEXEC and other subsidiary bodies; and
 - ii. noted that matters for action arising from CAC and other subsidiary bodies would be considered under Agenda Item 3 (Endorsement of methods of analysis and sampling).

ENDORSEMENT OF METHODS OF ANALYSIS, NUMERIC PERFORMANCE CRITERIA, SAMPLING PLANS, AND OTHER RELATED MATTERS IN CODEX STANDARDS (Agenda item 3)³

11. CCMAS45 considered the recommendations on methods of analysis, numeric performance criteria (NPC), and sampling plans proposed for endorsement by Codex subsidiary bodies, as well as related matters arising from CAC, as presented in CRD02 and CRD03.

Codex Committee on Contaminants in Foods (CCCF)

Sampling plans for total aflatoxins and ochratoxin A in certain spices

12. CCMAS45 endorsed the sampling plans for total aflatoxins (AFT) and ochratoxin A (OTA) in certain spices (i.e. nutmeg, dried chili, and paprika) proposed by CCCF18 (2025) as presented in CX/MAS 26/45/3 Appendix II, Tables 1-6.
13. CCMAS45 also considered the decision criteria for lots of large size (table 1) and, in cases where a lot was subdivided into sublots, whether a test result from an analytical sample of a subplot exceeding the Codex maximum limit (ML) would result in the rejection of the entire lot or only the subplot.
14. CCMAS45 agreed to ask CCCF to clarify, for lots ≥ 25 tons (tables 1, 3, and 5), whether a test result exceeding the ML in any subplot should result in the rejection of the entire lot or only the affected subplot. The clarification should include a clear decision tree or decision point, such as a footnote to these tables, similar to the footnotes in tables 2, 4, and 6, which states that if the test result exceeds the ML, the lot should be rejected.

Numeric performance criteria for total aflatoxins and ochratoxin A in certain spices and in certain food matrices

15. CCMAS45 was informed that the VWG reviewed the NPC and recommended example methods that could meet them.
16. The PWG further discussed challenges in interpreting and applying the NPC tables when a ML was established as a "sum of components," such as for AFT. PWG proposed to revise the relevant section of the *Information document on criteria approaches for methods that use a "sum of components"* to ensure consistency between paragraph 13 and the data and calculations presented in the NPC tables.
17. The PWG also discussed whether to retain the NPC for AFT or present it only for each individual isomer, since the methods measured the individual isomers separately and were then summed to determine whether AFT exceeded or fell below the ML. To ensure that the minimum applicable range continued to cover the ML for each isomer, the upper limit was adjusted to correspond to the sum of the isomers (i.e. AFT).
18. CCMAS45 reviewed the recommendations of the VWG and PWG, noted comments from members, and made the following decisions:

Revision to the Information document on criteria approaches for methods that use a "sum of components"

19. CCMAS45 agreed to amend paragraph 13 of the information document to read:

"If the components included in the ML definition are not present in constant ratios and where the inclusion of weighting factors of the individual components results in LOD/LOQ values or minimum applicable range that cannot be validated, ML/n should be used to determine the criterion for LOD (e.g. $1/5 \cdot ML/n$) and for LOQ (e.g. $2/5 \cdot ML/n$) or for the minimum applicable range (e.g. $ML/n + 2SR$) (e.g. $[ML/n - 2SR, ML + 2SR]$ for $ML < 0.1 \text{ mg/kg}$, and $[ML/n - 3SR, ML + 3SR]$ for $ML \geq 0.1 \text{ mg/kg}$), with n being the number of components included in the ML definition."

³ CX/MAS 26/45/3; CX/MAS 26/45/3-Add.1

Numeric performance criteria for total aflatoxins in certain spices and certain food matrices

20. CCMAS45 noted divergent comments in favour of or against retaining the NPC for AFT as follows:
- The NPC for AFT was similar to other procedures, where a calculation followed the analysis, with AFT being the sum of the individual isomers. The principle was comparable to an analytical method followed by calculation, since the reported value was the total of the isomers, not the results of the individual measurements.
 - The recovery range for AFT for certain spices, which was not directly measured, was listed as 60-115%, whereas the range for individual aflatoxins is 40-120%. Since the methods measured individual aflatoxins and the total was calculated from those values, this might support the removal of the NPC for AFT. However, the ML should be retained, while the remaining criteria could be omitted.
 - The NPC for AFT only applied to methods that directly measured AFT. Since all current methods measured each aflatoxin separately, this information did not apply to such methods and might even create confusion about which criteria a method must meet. Therefore, either the NPC for AFT, excluding the ML, should be removed, or a clear statement should be provided indicating that compliance must be based on the sum of individually measured aflatoxins.

Conclusion

21. CCMAS45 agreed to:
- i. remove the NPC for AFT, but keep the ML;
 - ii. endorse the revised NPC for the individual aflatoxins in certain spices (chili pepper, nutmeg) and certain food matrices (peanuts intended for further processing; tree nuts destined for further processing (almonds, hazelnuts, pistachios, and shelled Brazil nuts); ready-to-eat tree nuts (almonds, hazelnuts, pistachios, and shelled Brazil nuts); and dried figs);
 - iii. endorse the NPC for ochratoxin A in certain spices (chilli pepper, paprika, nutmeg); and
 - iv. include examples of methods for the NPC for individual aflatoxins for certain spices and certain food matrices, and for OTA in certain spices.
22. CCMAS45 also agreed to inform CCCF about the amendment to the Information document on criteria approaches for methods that use a “sum of components” and recommend that CCCF review the NPC for “sum of components” in sampling plans contained in the *General standard for contaminants and toxins in food and feed* (CXS 193-1995) to ensure consistency.

FAO/WHO Coordinating Committee for Asia (CCASIA)Sampling plans for regional standards

23. CCMAS45 was informed that the VWG reviewed the sampling plans for inspection by attributes (Table 2) and inspection by variables (Table 3) in CX/MAS 26/45/3 Appendix III. However, the VWG could not reach a consensus on whether to endorse them. It was noted that the sampling plans were designed around producers' risk (PR) rather than consumers' risk (CR), making them potentially unsuitable for their intended purpose. It was also highlighted that the sampling plans were based on ISO 2859-1, even though a revised version of that method was now available. Given these concerns, the VWG did not make a recommendation on endorsing the sampling plans and requested CCMAS to consider the sampling plans further.
24. Japan, speaking as the FAO/WHO Coordinator for Asia, emphasized that the commodities in question were specific to Asia and were well-understood by experts in the region. The Member noted that the sampling plans focused solely on quality and did not address consumer health; therefore, CCASIA23 agreed that an AQL of 6.5% was appropriate. While developing the sampling plans, CCASIA23 considered the statistical principles outlined in the *General guidelines on sampling* (CXG 50-2004) as well as the commodities' characteristics, including their prices and production volumes. Although larger sample sizes would improve statistical reliability, they would also significantly increase testing costs relative to the products' value, potentially raising prices for consumers and hindering fair trade. To avoid unnecessarily large sample sizes and ensure consistency with international standards, CCASIA23 supported a practical balance between statistical rigour and economic feasibility. Based on this, CCASIA23 agreed to adopt the sampling plans outlined in ISO 2859-1 and ISO 3951-1, both referenced in CXG 50-2004. These plans offered a high probability of accepting satisfactory-quality lots while effectively rejecting inferior ones, and CCASIA23 found them suitable for the commodities involved. In addition, the Member noted that the tables had been further reviewed, and no inconsistencies were found with CXG 50-2004.
25. New Zealand expressed concerns that the proposed sampling plans, based on ISO 2859-1, were primarily

designed to protect producers from rejecting good-quality products and therefore did not adequately address CR. The Member questioned why testing would be required if product quality were not a concern. The Member also noted that Appendix 2 of CXG 50-2004 clearly outlined the limitations of ISO 2859-1 for use in Codex, including its limited control of CR, its inability to account for measurement uncertainty, and the shortcomings of ISO 2859-1 AQL 6.5% plans, particularly when applied to small sample sizes, which might lead to unfair practices in trade.

26. New Zealand highlighted that CXG 50-2004 provided guidance on developing sampling plans that appropriately balanced PR and CR, which the current proposal from CCASIA23 did not achieve. To address these issues, the Member proposed establishing an EWG with experts from CCMAS and CCASIA to refine the plans, using CXG 50-2004 as the basis for determining suitable risk levels, and to consider additional issues raised by Japan, such as potential testing requirements.
27. CCMAS45 noted the importance of identifying which Codex committee was responsible for accepting PR and CR. While statistical components were significant, they were only one aspect of the decision-making process and Codex committees were responsible for assessing the risks and determining acceptable levels within a given sampling plan, e.g. CCCF evaluates CR and adjusts the stringency of the sampling plan based on the level of risk posed by the contaminant.
28. Based on the discussion above, Japan submitted CRD33, which contained a rationale for the development of the sampling plans, including relevant data and information, to support their endorsement. Japan further informed CCMAS45 that the figures in the sampling plan tables were consistent with the guidance provided in CXG 50-2004.
29. While several delegations expressed support for CRD33 and the endorsement of the sampling plans, New Zealand reiterated its concerns about the validity of the proposed sampling plans, which, in their view, remained unresolved and therefore could not support their endorsement. The Member further emphasized that, although CR had been calculated, there was no indication that the acceptability of those risk levels had been evaluated, which was an essential element to ensure consumers receive products of acceptable quality. The Member also recalled the absence of justification for excluding measurement uncertainty or for deeming the switching rules inherent to ISO 2859-1 AQL 6.5% plans impractical for international trade.
30. The Member therefore indicated that if the sampling plans were to be endorsed, a conditional mechanism should apply, otherwise it might set a precedent for similarly unsuitable sampling plans to be submitted in the future. This would jeopardize CCMAS' efforts in revising CXG 50-2004, undermine scientific integrity, and potentially damage the credibility of CCMAS in endorsing sampling plans under the guidance of CXG 50-2004.
31. The Chairperson noted that decisions on PR and CR were made by the relevant Codex committee, while CCMAS was responsible for verifying the accuracy of sampling plans and ensuring their alignment with guidance documents such as CXG 50-2004. The Chairperson further noted that Japan had reviewed the sampling plan tables and confirmed their consistency with CXG 50-2004, and that no additional comments had been received on this matter. The information contained in CRD33 was also deemed sufficient to allow CCMAS45 to make an informed, risk-based decision that reflected the shared responsibility between CCMAS and other Codex committees in developing and endorsing sampling plans that appropriately considered both PR and CR and ensured compliance with Codex standards.
32. Given these points and the unanimous support expressed by CCASIA Members present at the session, the Chairperson observed that returning the sampling plans to CCASIA was unlikely to produce a different response or outcome. While also acknowledging the concerns raised, the Chairperson advised that CCMAS could proceed with endorsing the sampling plans proposed by CCASIA23 and at the same time forward the concerns expressed at CCMAS45 to CCASIA.
33. The Chairperson further recalled the decision of CCMAS42 (2023), which requested Codex committees to review their sampling plans in light of the revised CXG 50-2004, and noted that related issues could be taken up on a broader level under Agenda item 7.1.

Conclusion

34. CCMAS45:
 - i. endorsed the sampling plans proposed by CCASIA (Appendix II, Part **);
 - ii. noted the comments and concerns raised during the consideration of the sampling plans (paragraphs **) and agreed to inform CCASIA of these comments and concerns; and
 - iii. advised CCASIA to consider reviewing its sampling plans in light of the guidance provided in the

revised CXG 50-2004, in accordance with the recommendation of CCMAS42⁴.

FAO/WHO Coordinating Committee for the Near East (CCNE)

Methods of analysis for the Regional standard for maamoul

35. CCMAS45 was informed that the VWG reviewed the sampling plans proposed by CCNE12 in the Regional standard for maamoul (Near East) and made revisions as explained in CRD02. Further to these revisions, CCMAS45 agreed on the following clarifications and adjustments to CRD02 Appendix II:
- AOAC 972.32 has been validated for flour, whereas AOAC 970.70 was validated only for baked foods.
 - For extraneous matter, the principle was amended to refer to “microscopy” for better accuracy.
 - For pH determination, AOAC 981.12 was replaced by AACC 02-52.01, which was identical to AOAC 943.02. Since validation data supported their use for flours, bread, cookies, and crackers, these methods were reclassified as Type II. Additionally, NMKL 179 was removed because there was no validation data supporting its use for baked foods, and to prevent listing multiple methods as Type IV, since ISO 1842, originally proposed by CCNE12, was already available as a Type IV method.
 - For moisture determination, the principle was amended to specify the drying temperature range.

Conclusion

36. CCMAS45 endorsed the methods of analysis in the Regional standard for maamoul (Near East) (Appendix II, Part **).

Codex Committee on Spices and Culinary Herbs (CCSCH)

Methods of analysis for spices and culinary herbs based on replies from CCSCH8:

37. Small cardamom (*Standard for spices derived from dried or dehydrated fruits and berries* (CXS 357-2024)); turmeric (*Standard for dried and dehydrated roots, rhizomes, and bulbs* (CXS 359-2024)); dried or dehydrated chili pepper and paprika (*Standard for dried or dehydrated chili pepper and paprika* (CXS 353-2022)); and cloves (*Standard for dried floral parts* (CXS 344-2021))
38. CCMAS45 was informed that the VWG reviewed the analytical methods submitted by CCSCH7 (2024), which were updated based on replies from CCSCH8 (2025), following the questions put forward by CCMAS43 (2024)⁵, as explained in CRD02.
39. Further to these revisions, CCMAS45 agreed that for cloves, the qualifier “whole” applies to the commodity rather than the provision.
40. CCMAS45 also agreed to retain the note attached to ISO 927 regarding the 100 g test portion, even though it may seem redundant, since ISO 927 did not specify the type of cardamom, whereas the commodity standard already covered this requirement. However, CCSCH had confirmed a minimum test portion of 100 g for light seeds and small cardamom, and the footnote reflected that clarification. It was further noted that CCSCH recommended fixing the test portion for cardamom—whether small or large—at 100 g, in line with ISO 927, and that the terms used in CXS 234-1999 (small cardamom) and ISO 927 (light seeds/cardamom seeds) also appeared to be consistent.

Conclusion

41. CCMAS45 endorsed the methods of analysis for small cardamom (*Standard for spices derived from dried or dehydrated fruits and berries* (CXS 357-2024)); turmeric (*Standard for dried and dehydrated roots, rhizomes, and bulbs* (CXS 359-2024)); dried or dehydrated chili pepper and paprika (*Standard for dried or dehydrated chili pepper and paprika* (CXS 353-2022)); and cloves (*Standard for dried floral parts* (CXS 344-2021)). (Appendix II, Part **).

Methods of analysis for spices and culinary herbs:

Standards for spices in the form of dried fruits and berries, provisions for vanilla; spices in the form of dried fruits and berries, provisions for large cardamom; spices in the form of dried seeds, provisions for dry and/or dehydrated coriander

42. CCMAS45 was informed that the PWG had reviewed the analytical methods submitted by CCSCH8. The PWG made revisions as outlined in CRD03 and identified provisions requiring clarification by CCSCH. Following these revisions, CCMAS45 further agreed that ISO 939 and ISO 928 should explicitly state that the analytical

⁴ REP23/MAS, para 81 (iii)

⁵ REP24/MAS, para 10 (iii, iv, v)

principles were gravimetry for ash (with incineration at 550°C as part of the procedure) and distillation for moisture. Accordingly, calculations should be based on moisture and ash results, with “incineration at 550°C” indicated in parentheses.

Conclusion

43. CCMAS45 agreed to:
- i. endorse the methods of analysis for vanilla (spices in the form of dried fruits and berries); large cardamom (spices in the form of dried fruits and berries); and dried and/or dehydrated coriander (spices in the form of dried seeds) (Appendix II, Part **);
 - ii. inform CCSCH that qualifiers such as “whole”, “powdered/pieces” were product styles and as such should be attached to the commodity name rather than in the principle; and
 - iii. request CCSCH to clarify whether the following methods were fit-for-purpose:
 - a. AOAC 993.27, as a Type III method with principle “Colorimetry”, for determining “mammalian and/or other excreta” in large cardamom and in dried dehydrated coriander; and
 - b. ISO 927, with principle “Visual examination (gravimetry)”, for the determination of “mammalian and/or other excreta” in dried and dehydrated coriander.

Codex Committee on Fats and Oils (CCFO)

44. CCMAS45 was informed that the PWG had reviewed the analytical methods submitted by CCFO29. The PWG made revisions as outlined in CRD03 and identified provisions requiring clarification by CCFO. Following these revisions, CCMAS45 also made additional editorial corrections to improve clarity and accuracy and noted that the standard for microbial omega-3 oils had been submitted to CAC49 for adoption at Step 5 and would be further reviewed by CCFO.

Conclusion

45. CCMAS45 agreed to:
- i. endorse the methods of analysis for the determination of gamma oryzanol in crude rice bran oil (Appendix II, Part **);
 - ii. endorse the methods of analysis in the draft standard for microbial omega-3 oils (except for moisture and volatile matter), noting the draft standard will be sent for adoption by CAC49 at Step 5 and the methods will not be included in CXS 234-1999 until final adoption of the standard (Appendix III); and
 - iii. return a question to CCFO about their preference for the two options to determine moisture and volatile matter in microbial omega-3 oils, specifically:
 - Option 1: Split the provision into two separate provisions that include the temperature. In this case, two numeric values in accordance with each method should be elaborated.
 - Moisture and volatile matter at 103°C
 - Moisture and volatile matter at 130°C
 - Option 2: Choose one method for this provision, which CCMAS would then consider for endorsement
 - iv. inform CCFO that the methods for moisture in microbial omega-3 oils actually measured water, and whether a provision name of “water” might be more accurate and clearer than the current provision name “moisture”.

Other matters

46. CCMAS45 recalled the issues raised at CAC48 (2025) regarding the revocation of the method for salt saturation in salted and dried salted fish of the *Gadidae* family, as well as the lack of necessary validation data for some example methods provided for certain NPC related to salt and sodium. Taking into account CRD09, the PWG reviewed these matters and summarized its outcomes in CRD03.

Conclusion

47. CCMAS45 agreed to:
- i. endorse the PWG’s recommendation to retain the method of analysis and preparation of fish samples for salted fish and dried salted fish of the *Gadidae* family of fishes in CXS 234-1999 with amendments (Appendix II, Part **); and

- ii. endorse the revised NPC for sodium chloride and for salt determined as chloride expressed as sodium chloride (Appendix II, **Part ****).

Conclusion

48. CCMAS45 agreed to:

- i. forward the methods of analysis, numeric performance criteria and sampling plans to CAC49 for adoption/revocation for inclusion in CXS 234-1999 (Appendix II, **Part ****);
- ii. inform CCSC, CCFO, CCCF and CCFFP of the respective decisions (paragraphs ***, ***) and refer relevant requests to CCFO, CCSC and CCCF (paragraphs ***, ***,);
- iii. re-establish the PWG on endorsement of methods of analysis and sampling, chaired by the United States of America (USA) and co-chaired by Hungary and Japan, working in English, French and Spanish, to meet immediately prior to CCMAS46, working in English, French and Spanish to consider:
 - a. agreed to re-establish all methods of analysis and sampling submitted by Codex committees for endorsement;
 - b. the outcomes of the work of the EWGs on the four workable packages: (i) cocoa products and chocolates, (ii) sugars and honey, (iii) fruit juices, and (iv) natural mineral waters (see Agenda item 5); and
 - c. any other matters referred by Codex committees or submitted by Members and Observers.

MATTERS PENDING FROM CCMAS44 (Agenda item 4)

REVIEW OF METHODS OF ANALYSIS IN COMMODITY STANDARDS (FISH AND FISHERY PRODUCTS, FATS AND OILS, CEREALS, PULSES AND LEGUMES AND DERIVED PRODUCTS) (Agenda item 4.1)⁶

- 49. Canada, as Chair of the EWG, introduced the item and recalled that the recommendations of the EWG were considered by the PWG on endorsement of methods of analysis and sampling and the outcomes of the PWG were reflected in CRD03.
- 50. The EWG Chair explained that the summary table contained in CRD03, Appendix VI, Part 1 reflected the PWG recommendations, including endorsement decisions for methods related to provisions in standards for fish and fishery products, fats and oils and cereals, pulses and legumes and derived products, as well as a referral to Codex Committee on Cereals, Pulses and Legumes (CCCPL) on whether the provision "insect bored kernels" should be renamed "grains attacked by pest" in relation to the method for insect bored kernels in wheat and durum wheat and if so, whether the limits in the *Standard for wheat and durum wheat* (CXS 199-1995) would still be applicable.
- 51. CRD03 Appendix VI, Part 2 reflected the consequential changes required to relevant commodity standards.

Discussion

- 52. CCMAS45 considered all provisions in CRD03 Appendix VI, aligned methods' principles with decisions taken under agenda item 8, and made following additional comments and decisions.

Fish and fishery products

Quick frozen fish sticks (fish fingers), fish portions and fish fillets – breaded or in batter

- 53. CCMAS45 amended the provision to clarify that the determination concerned the percentage (%) fish content and to include a reference to Appendix VI of CXS 234 in the methods column, as a calculation contained in that appendix was required. A consequential correction was made to Appendix VI of CXS 234 ("Other methods"), Method 2 related to the determination of percentage (%) fish content.

Cereals, pulses, legumes and derived products

Broken kernels – maize (corn)

- 54. CCMAS45 agreed to replace ISO 5223 with ISO 19942, noting that ISO 5223 applied only to test sieves and was not appropriate for the specification for broken maize (corn) kernels. ISO 19942 was identified as more appropriate as it focused on the product specification (broken kernels) through visual examination and gravimetry.

⁶ CL 2026/1-MAS; CX/MAS 26/45/4; CX/MAS 26/45/4-Add.1 (Comments of Chile, Egypt, Guatemala, Indonesia, Philippines, Senegal, the United States of America and the International Commission for Uniform Methods of Sugar Analysis (ICUMSA))

Wheat and durum wheat – shrunken and broken kernels

55. CCMAS45 agreed to delete ISO 5223 and to replace it with ISO 7970 for shrunken (shrivelled) and broken kernels in wheat and to include a more appropriate method, ISO 1105, for the provision for shrunken(shrivelled) and broken kernels in durum wheat.

Provisions for which no methods identified

56. CCMAS45 noted that no methods had been identified for certain provisions for oats and peanuts (CRD 03, Appendix III), and that consideration could be given to the identification of these methods in the future. Members and Observers were welcome to submit methods through the CCMAS procedure (Appendix II, Part **).

Other matters*Olive oils and pomace olive oils – peroxide value*

57. The PWG Chair recalled that the IOC has requested the endorsement of COI/T.20/Doc. No 38 as a Type I method for peroxide value in olive oils and olive pomace oils, which would be published in March 2026. However, questions were raised about whether the method was identical to ISO 3960 / AOCS Cd 8b-90 / NMKL 158 endorsed for this provision.
58. CCMAS45 noted that the data provided by IOC in CRD26 (rev) were consistent with data from ISO supporting the acceptability of the method as identical to the ISO method and the method was therefore endorsed for the determination of peroxide value in olive oils and olive pomace oils for inclusion in CXS 234-1999.

Conclusion

59. CCMAS45 agreed to:
- i. submit the methods of analysis for adoption / revocation by CAC49, with the adopted methods to be incorporated into CXS 234-1999 (Appendix II) and amendments to relevant commodity standards (Appendix II, part **);
 - ii. inform CCFFP, CCFO and CCCPL of the respective decisions taken at the session (paragraphs **); and
 - iii. request CCCPL to consider whether the provision "insect bored kernels" should be renamed "grains attacked by pest" in relation to the method for insect bored kernels in wheat and durum wheat and whether the limits in the *Standard for wheat and durum wheat* (CXS 199-1995) would still be applicable.
60. CCMAS45 thanked Canada and the members of the EWG for the work done, noting that the EWG had completed its work according to its terms of reference (ToRs).

RETYPING OF ISO 1871 FOR DETERMINING PROTEIN IN QUINOA (Agenda item 4.2)⁷

61. CCMAS45 recalled that CCMAS44 had agreed to retain ISO 1871 for the determination of protein in quinoa in CXS 234-1999 as a Type IV method and had requested the PWG on endorsement to reconsider the typing of the method in light of the information contained in MAS44/CRD19.
62. The PWG considered the information from CRD19 and reproduced in CX/MAS 26/45/5.
63. The USA, as Chair of the PWG, drawing attention to CRD03, reported that divergent views had been expressed within the PWG regarding the retyping of ISO 1871. While some Members supported retyping ISO 1871 as a Type I method based on the data provided, which demonstrated the robustness of the method, others were of the view that ISO 1871 should be retained as a Type IV method, as it is a guideline and does not meet the criteria for a Type I method. It was also noted that ISO had agreed to expand the scope of ISO 20483 for cereals to include quinoa, subject to sponsorship by a member country. Consequently, retyping ISO 1871 as a Type I method could create difficulties in replacing the method once the validation study on ISO 20483 is completed. On this basis, the PWG recommended retaining the current Type IV classification.
64. The PWG Chair informed CCMAS45 that Hungary had offered to organize proficiency testing (PT) studies to support the extension of the scope of ISO 20483. The Chairperson confirmed that the PT and validation trials would include quinoa, teheana, buckwheat and possibly other matrices and would be evaluated with the assistance of ISO, AOAC and AACCI.
65. In addition, the PWG noted that ISO 1871 had previously been endorsed as a Type I method for protein determination in teheana. In view of the recommendation to retain ISO 1871 as a Type IV method for protein

⁷ CX/MAS 26/45/5

determination in quinoa, the PWG recommended retyping ISO 1871 as a Type IV method for protein determination in teheña.

Conclusion

66. CCMAS45 agreed to:
- i. retain ISO 1871 as Type IV for protein in quinoa, noting the reservation of Peru to this decision;
 - ii. retype ISO 1871 as Type IV for protein in teheña and to:
 - a. forward this amendment to CAC49 for adoption (Appendix **); and
 - b. inform CCNE accordingly.

REVIEW OF METHODS OF ANALYSIS IN CXS 234 (Agenda item 5)

67. CCMAS45 recalled that the PWG on endorsement had considered the recommendations from the EWGs on two workable packages: cocoa products and chocolate, and sugars and honey, and from the expert group on the fruit juices workable package. CCMAS45 considered the recommendations presented in CRD03.

FRUIT JUICES WORKABLE PACKAGE (Agenda item 5.1)⁸

68. The United State of America (USA), as Chair of the PWG, speaking also on behalf Hungary, Japan and Uruguay as co-chairs, informed CCMAS45 that the PWG had considered the report and recommendations of the expert group convened by IFU, which proposed a number of changes to methods of analysis, identified several methods that were no longer supported or validated, and recommended their revocation. These recommendations for revocation were supported by the PWG.
69. The PWG Chair further noted that, given the complexity, scope, and volume of the proposed changes, as well as the fact that the work had been undertaken by a limited group of experts rather than a full EWG, the PWG recommended that the proposed changes undergo further review by an EWG.

Discussion

70. CCMAS45 agreed with the proposed revocation of methods, as recommended, and further agreed that an EWG should continue the review of the recommended changes to methods of analysis proposed by the expert group.
71. CCMAS45 also recalled that several enzymatic and ISO methods had not been reviewed by the IFU expert group and noted IFU's offer to support the EWG by undertaking an initial review of these methods for its consideration.

Conclusion

72. CCMAS45 agreed to:
- i. forward the methods for revocation to CAC49 (Appendix **); and
 - ii. establish an EWG chaired by Germany, working in English to:
 - a. review the methods, recommended by the expert group, as presented in Appendix ***;
 - b. review the remaining enzymatic and ISO methods (Appendix IV) taking into account the initial review by IFU; and
 - c. prepare and submit the report of the EWG to the Codex Secretariat at least three months prior to CCMAS46.

COCOA PRODUCTS AND CHOCOLATE WORKABLE PACKAGE (Agenda item 5.2)⁹

73. CCMAS45 noted that while the PWG had considered the recommendations of the EWG on the cocoa products and chocolate workable package, concerns were raised regarding the late availability of the EWG report. This limited the opportunity for adequate consultation.
74. CCMAS45 therefore agreed that the EWG should be re-established to continue the review of the cocoa products and chocolate workable package and that the recommendations of the PWG as contained in CRD03 could serve as a basis for discussion.

Conclusion

⁸ CX/MAS 26/45/6

⁹ CX/MAS 26/45/7

75. CCMAS45 agreed to:
- i. re-establish the EWG on cocoa products and chocolate workable package, chaired by USA and co-chaired by Serbia working in English to:
 - a. continue with the review of methods in this workable package and to use the recommendations of the PWG (Appendix IV) as a basis for discussion;
 - b. use the EWG online platform for discussions and publication of consultation documents; and
 - c. prepare and submit the report of the EWG to the Codex Secretariat at least three months prior to CCMAS46.
 - ii. request the Codex Secretariat to issue a circular letter (CL) requesting comments on the recommendations in Appendix IV for consideration by the EWG.

SUGARS AND HONEY WORKABLE PACKAGE (Agenda item 5.3)¹⁰

76. The USA, as Chair of the PWG on endorsement, speaking also on behalf of the co-Chairs Hungary, Japan and Uruguay, reported that the review of the workable package on sugars and honey had been led by Uruguay as Chair of the EWG. The PWG Chair noted that this was a complex workable package, drawing on historical commodity standards that were less clearly defined than those typically considered by CCMAS. Several of the methods addressed issues such as authenticity and food additives, resulting in a diverse range of methods for review and an extensive body of work.
77. The PWG Chair explained that the summary table contained in CRD03, Appendix V, reflected the recommendations of the PWG, including endorsement decisions, the proposed conversion of certain methods (e.g. the testing methods for sulfites in sugars and hydroxymethylfurfural content in honey) to numeric performance criteria (marked as “NPC-EWG”), or methods identified for further consideration by the EWG.
78. The PWG Chair further noted that, based on an intervention, AOAC 998.12, a method for the detection of added sugars from corn and cane sugar products, could pose a risk of false positive results for Manuka honey, a regional product. In order to include this method in CXS 234-1999 while avoiding unintended impacts on products outside its scope, a footnote was proposed by the PWG to clarify its application.

Discussion

79. CCMAS45 considered all methods in CRD03 Appendix V and made the following additional comments and decisions.

Honey: Diastase activity

80. A Member noted that the methods AOAC 958.09 and IHC 6.1 for the determination of diastase activity in honey were not identical and therefore might not be appropriately considered together as a single Type I method.
81. CCMAS45 agreed to refer this method to the re-established EWG for further consideration.
82. Consequently, to avoid the absence of an endorsed method, CCMAS45 agreed to retain the current testing method (IHC method for the determination of diastase activity using Phadebas, 2009, with the exception that the incubation time should be increased from 15 to 30 minutes) in CXS 234-1999.

Honey: Sugars added (authenticity)

83. A Member expressed the view that the authenticity method (i.e. EN 17958), accompanied by a footnote, had not been endorsed, noting that the range used to assess authenticity was problematic and that reference was being made to values for which there was insufficient clarity or expertise. It was further noted that additional discussion would be required on this matter, and concern was expressed regarding the inclusion of such a footnote in the document.
84. The PWG Chair supported this view and proposed that the method be referred back to the EWG for further consideration. It was noted that authenticity methods might require a level of specialized expertise beyond that generally available within CCMAS, and that additional expert input would therefore be beneficial. It was further noted that, during the EWG discussions, a suggestion had been made to involve experts from Members with specific experience in authenticity methods to assist the EWG in addressing issues related to method typing and applicability.
85. CCMAS45 agreed to the proposal of the PWG Chair to refer this method to the re-established EWG for further

¹⁰ CL 2026/4-MAS; CX/MAS 26/45/8; CX/MAS 26/45/8-Add.1 (Comments of Australia, Canada, Chile, Colombia, Ecuador, Egypt, European Union, Indonesia, Iraq, Peru, Philippines, Rwanda, the United States of America (USA), and the International Commission for Uniform Methods of Sugar Analysis (ICUMSA))

consideration.

Honey: Sugars profile (glucose, fructose, sucrose)

86. In order to evaluate the validation of the testing method for this provision (i.e. AOAC 977.20), CCMAS45 agreed to refer this method to the re-established EWG for further consideration.

Honey: Sugars added: detection of C4 sugar

87. CCMAS45 discussed whether to address the applicability of AOAC 998.12 to Manuka honey through the immediate inclusion of a footnote in CXS 234-1999 or to defer this matter pending further review. Members expressed support for the inclusion of a footnote to clarify the applicability of the method to Manuka honey, noting that published scientific evidence was available and that such clarification would help avoid unintended impacts on trade.
88. Taking into account the views expressed above, as well as concerns regarding the validation data and the need for further review of AOAC 998.12, CCMAS45 agreed to:
- insert a footnote excluding Manuka honey; and
 - refer this method to the re-established EWG for further consideration.

Sugars (dextrose anhydrous and dextrose monohydrate): D-Glucose

89. Noting that the method for this provision (ISO 5377) was a Type I method and therefore could not be converted to numeric performance criteria (NPC), CCMAS45 agreed to refer this method to the EWG for further consideration.

Sugars (fructose, lactose): pH

90. CCMAS45 agreed to revise the typing of the testing method for this provision (ICUMSA GS 1-23) from Type I to Type II, to ensure consistency with other methods.

Sugars (fructose, powdered sugar, white sugar, plantation or mill white sugar): Conductivity ash; Sugars (plantation or mill white sugar, soft white sugar and soft brown sugar): Conductivity ash

91. A Member drew attention to the methods for conductivity ash, noting that title for Method ICUMSA GS 2-17 was “The Determination of Conductivity Ash in Refined Sugar Products and in Plantation White Sugar” and the title for ICUMSA GS 1-13 was “The Determination of Conductivity Ash in Raw Sugar, Brown Sugar, Juice, Syrup and Molasses”.
92. Another Member further noted a potential inconsistency in the table for plantation and mill white sugar, where two different method types appeared to be indicated for the same provision.
93. CCMAS45 agreed to refer these two methods back to the EWG for further consideration.

Sugars (soft white sugar and soft brown sugar): Invert sugar (as reducing sugars): ICUMSA GS 4-3 (applicable at levels >10% m/m); Sugars (soft white sugar and soft brown sugar): Invert sugar (as reducing sugars): ICUMSA GS 1-3 (applicable at levels <10% m/m)

94. CCMAS45 agreed to refer these two methods back to the EWG for further consideration.

Sugars (plantation and mill white sugar, soft white sugar, powdered sugar): Colour (ICUMSA Unit)

95. CCMAS45 agreed to correct the principle for the testing method for this method to visible spectrophotometry.

Sugars (powdered sugar): Colour

96. CCMAS45 agreed to revoke the method, as another Type I method already existed for this provision.

Sugars (plantation or mill white sugar): Polarization

97. CCMAS45 agreed to revoke the method, as it was already covered by another method.

Pending issues identified by the EWG Chair

98. Uruguay, speaking as the EWG Chair, indicated that several pending issues had not been addressed by the EWG. It was noted that testing methods for certain provisions in the *Standard for honey* (CXS 12-1981) (e.g. determination of sugars content and determination of electrical conductivity) had not been developed and that the standard did not include parameters for authenticity. It was further noted that some methods contained in the *Standard for sugars* (CXS 212-1999) were not covered by CXS 234-1999 and therefore lacked corresponding analytical methods (i.e. starch content), and that methods would need to be identified for these provisions. In addition, it was noted that a number of food additives, other than sulfites, were allowed for use in products conforming to CXS 212-1999 but were not listed in CXS 234-1999, and that consideration would

be needed as to whether analytical methods should be identified for these additives.

99. The EWG Chair indicated that these issues represented a summary of matters that would need to be addressed by the EWG in its future work.

Other matters

100. A Member reiterated an intervention made in the PWG concerning raw sugar that, while a definition for raw sugar existed in CXS 212-1999, no quality factors had been established for this product, despite the significant level of international trade in raw sugar. Concern was expressed that, in the absence of established quality factors, the continued inclusion of raw sugar might not be appropriate, and it was suggested that it be deleted. It was further noted that care should be taken to clearly distinguish raw sugar from refined (white) sugar, which was already covered by quality factors. In addition, it was noted that the provision on invert sugar might also require revision.
101. In response, the Codex Secretariat clarified that any revision of a commodity standard under a Codex committee that had adjourned *sine die* would require a formal proposal from a Member and a request to CAC, which would decide when and how to undertake the work. It was noted that, at this stage, CCMAS could only record that a potential gap had been identified and that a future revision of the standard might be necessary, without prejudice to any Member submitting a proposal through the Codex Secretariat.

Conclusion

102. CCMAS45 agreed to:
- i. submit the methods for adoption / revocation by CAC49 (Appendix II*, Part **);
 - ii. re-establish the EWG chaired by Uruguay and co-chaired by Brazil and China, working in English and Spanish, to:
 - a. continue reviewing the relevant methods in the sugars and honey workable package (Appendix IV, Part **), including the establishment of NPCs for some provisions;
 - b. consider, as appropriate, other issues identified by the EWG Chair (see paragraph **); and
 - c. prepare and submit the report of the EWG to the Codex Secretariat at least three months prior to CCMAS46.
103. CCMAS45 encouraged the active participation of Codex Members and Observers in the EWG discussions, as well as the involvement of relevant experts to assist the EWG in its discussions and decision-making.

Other matters

104. CCMAS45 considered review of additional workable packages and agreed to:
- i. start the review of methods in the sugars and honey workable package; and
 - ii. establish an EWG chaired by the USA, working in English, to:
 - a. review the milk and milk products workable package; and
 - b. prepare and submit the report of the EWG to the Codex Secretariat at least three months prior to CCMAS46.

METHODS OF ANALYSIS FOR PRECAUTIONARY ALLERGEN LABELLING (Agenda item 6)¹¹

105. The USA, as Chair of the EWG, speaking also on behalf of the co-chair, the United Kingdom (UK), introduced the item. The EWG Chair recalled that, in response to CCFL's request for advice on the availability of suitable analytical methods for determining allergenic protein in food, CCMAS had established, and subsequently re-established, the EWG to evaluate the relevant methods and to compile and format the information submitted by Members into a draft response to CCFL.
106. The draft document for submission to CCFL comprised three parts: (i) a draft response from CCMAS to the request from CCFL47; (ii) Table 1, listing methods of analysis in support of precautionary allergen labelling with published multi-laboratory validation studies or performance-tested methods; and (iii) Table 2, listing methods of analysis currently available in support of precautionary allergen labelling but lacking multi-laboratory validation studies.
107. The EWG Chair informed CCMAS45 that, based on comments received, the draft document had been revised to further emphasize that: (i) the methods listed in Tables 1 and 2 were provided solely to support CCFL's

¹¹ CX/MAS 26/45/9

deliberations on reference doses and should neither be forwarded to CCMAS for endorsement nor cited in CCFL texts; (ii) analytical methods were available to detect and quantify unintended allergen presence resulting from cross-contact, with limits of detection and quantification suitable for determining whether such presence exceeded or fell below the action levels established by the FAO/WHO Expert Consultation for priority allergens; and (iii) some corrections had been made to Tables 1 and 2.

Discussion

108. CCMAS45 considered the revised document.
109. The FAO representative recalled that, during the joint FAO/WHO Expert Consultation on Food Allergens, experts had reached consensus that the reference doses recommended by FAO/WHO and currently under discussion by CCFL could be implemented and monitored using existing analytical capabilities. It was further noted that the current recommendations of the EWG were inclusive and aligned with the conclusions of the Expert Consultation, which confirmed that analytical methods were available to detect and quantify unintended allergen presence (UAP) in foods.
110. An Observer noted that, although the development of Codex method performance criteria had been considered potentially duplicative in light of existing AOAC and European frameworks, these frameworks were not fully aligned in practice. It was observed that fixed numerical criteria established in certain standards differed structurally from AOAC standard performance requirements, such that compliance with one framework would not necessarily ensure compliance with another. The Observer further noted that numerical performance criteria were generally not applicable to immunoassay- or PCR-based methods and indicated that clarification was needed as to whether harmonized fitness-for-purpose or performance expectations could be described for such methods. It was suggested that describing broader performance expectations, rather than fully harmonizing validation frameworks, could support more consistent fitness-for-purpose assessments and facilitate international trade.
111. In response, the EWG Chair clarified that differences existed between numerical performance guidelines and AOAC standard performance requirements. While it was acknowledged that Codex could potentially develop general performance criteria to address such differences, it was emphasized that this would constitute new work and was outside the scope of the current activity.
112. In response to comments that a gap remained in clearly identifying methods suitable for quantifying UAP across food intakes of 10–1000 g for CCFL use, CCMAS45 noted that existing methods were capable of detecting and quantifying UAP for priority allergens within this intake range and that this was captured in the draft response to CCFL.
113. Noting that no single analytical method performed optimally across all food matrices and processing conditions, and that PCR methods for gluten, while potentially supporting a risk-based approach, were indirect methods, CCMAS45 agreed to remove PCR for gluten from Table 2.
114. With regard to clarification on casein and total milk protein, CCMAS45 noted some ELISA kits report results in units different from those in the [Risk Assessment of Food Allergens Part 2: Review and Establish Threshold Levels in Foods for the Priority Allergens](#), and in these cases a conversion factor is provided by the manufacturer to convert to 'mg total protein from the allergenic food / kg food.' For example, some kits detect both casein and whey proteins and report total milk protein, while others quantify only one protein fraction and the result is then converted to total milk protein. Accordingly, result reporting units in tables 1 and 2 were corrected where possible.
115. Regarding the three entries for walnut in Table 1, the EWG Chair explained that the methods had been submitted as multi-laboratory validated by a Member; however, no supporting citations had been provided. CCMAS45 agreed to move these three entries from Table 1 to Table 2.
116. CCMAS45 agreed to insert and delete certain entries in Tables 1 and 2 and made corresponding editorial revisions (e.g. corrections of the reporting unit).

Conclusion

117. CCMAS45 agreed to forward the reply, together with the two tables as presented in Appendix V, to CCFL.

SAMPLING PLANS: DISCUSSION PAPERS (Agenda item 7)

REVIEW OF SAMPLING PLANS IN CXS 234-1999 (Agenda item 7.1)¹²

¹² CL 2026/5-MAS; CX/MAS 26/45/10; CX/MAS 26/45/10-Add.1 (Comments of Australia, Brazil, Ecuador, Egypt, European Union, Indonesia, Iraq, Japan, Peru, Rwanda, United States of America (USA) and the International Commission for Uniform Methods of Sugar Analysis (ICUMSA))

118. New Zealand, as Chair of the EWG, speaking also on behalf of the co-Chair, Germany, introduced the item and explained the background to the work, previous discussions in CCMAS and the EWG, its conclusions and recommendations.
119. The EWG Chair explained that four options were identified for the inclusion of sampling plan information in the Codex system and there was strong support for option 1 (Include information on sampling plans in CXS 234-1999), with sampling plan information maintained alongside methods of analysis in CXS 234-1999, preferably within a database. This was in line with previous decisions of CCMAS36(2015)¹³ and CAC39(2016)¹⁴ for CXS 234-1999 to be a single reference for methods of analysis and sampling.
120. In addition, there was also support for option 4, to have a standard for each commodity group. This was seen as a practical approach to advance sampling plans. Unless there was a specific need for a more stringent plan for a particular application, the same sampling plan could be applied across provisions, taking into account any other relevant considerations.
121. A review of sampling information in Part B of CXS 234-1999 showed that entries largely described physical sampling procedures only, with limited reference to inspection sampling plans. Only the milk and milk products group referred to inspection standards, and none identified specific sampling plans (e.g. Acceptance Quality Limit (AQL), Critical Quality Level (CQL), or Producer's risk (PR)) for individual provisions. Overall, the information in CXS 234-1999 was found to be insufficient to ensure fully harmonized and enforceable standards.
122. A broader review of Codex standards confirmed a general lack of sampling plan information across the Codex system. As a result, Codex standards cannot be considered fully harmonized. While the *Codex Procedural Manual* indicates that CCMAS may have a role in developing sampling plans, concerns were noted regarding the suitability of CCMAS setting plans for diverse commodity groups, particularly given limited product-specific expertise and challenges in engaging committees that had been adjourned *sine die*.
123. The EWG Chair proposed that CCMAS45 consider the recommendations in paragraph 13 of CX/MAS 26/45/10 including the re-establishment of an EWG to further explore the type and format of information in CXS 234-1999 and the features of the database.

Discussion

Inclusion of sampling plans information in CXS 234-1999 / database

124. There was general support for option 1, i.e. to house all sampling plans in CXS 234-1999 and in the form of a searchable database, as this was the most user-friendly approach, which would facilitate the identification of the appropriate combination of sampling and analytical methods required for testing. This approach was in line with the decision of CCMAS36 (2015) and CAC39 (2016) that CXS 234-1999 should serve as the single reference for methods of analysis and sampling.
125. There was also support to avoid duplicating the number of sampling plans to the extent possible by forming commodity groups for certain provisions.
126. CCMAS45 noted that sampling plans should not co-exist in commodity or other relevant standards to avoid any inconsistencies between CXS 234-1999 and the associated Codex standards.
127. With respect to the database, CCMAS45 welcomed the work currently underway by the Codex Secretariat and noted that further discussions through an EWG on the features and design for the database would help to support the ongoing work.
128. While it was noted that the construction of the database was underway, CCMAS noted that a paper version of CXS 234-1999 in its current format was still required and, in this respect, further work was needed on the format and type of information to be integrated into CXS 234-1999.

Review of sampling plans for inclusion in CXS 234-1999

129. CCMAS45 considered questions with regard to the review of the sampling plans for integration into CXS 234-1999 and noted that there were a number of standards that lacked sampling plans. It was also noted that the responsibility was with respective commodity committees or other relevant committees to assess parameters that determined the selection of appropriate sampling plans for a given commodity provision combination.
130. The Codex Secretariat reiterated that the development of sampling plans laid with the respective commodity or other relevant committees and that while CCMAS could assist with advising on and/or the development of sampling plans, the identification of values for provisions such as consumer risk (CR) or producer risk (PR)

¹³ REP15/MAS paragraph 110

¹⁴ REP16/CAC Appendix II

was with the commodity committee or other relevant committee. The Codex Secretariat further explained that while it was preferable for Codex standards to have sampling plans for completeness, committees were under no obligation to develop such plans. If CCMAS were to consider developing sampling plans, it should consider whether it had sufficient resources to undertake such work.

131. The Codex Secretariat therefore suggested a pragmatic, step-wise approach for integrating sampling plans into CXS 234-1999 and/or the database. The Codex Secretariat recommended that CCMAS focuses on reviewing existing sampling plans rather than developing new ones. The review should primarily target updating existing sampling plans in commodity standards where there is an active committee to facilitate coordination. Meanwhile, the review of sampling plans in commodity standards developed by committees that have been adjourned sine die should be addressed in a second phase.
132. This approach received general support as it took into consideration the resources available in both CCMAS and other relevant Codex committees.
133. To a question on whether measurement uncertainty data were considered necessary to support the development and application of sampling plans, the EWG Chair explained that such data were required to determine whether the measurement uncertainty was non-negligible. However, this assessment depended on the relationship between measurement uncertainty and analytical variability, which may vary by producer, country, or product. As a result, a single, blanket approach might not be appropriate.

Communication with relevant committees

134. CCMAS45 agreed that, at this stage, relevant Codex committees should be informed and encouraged to review their existing sampling plans. Any subsequent requests for support from CCMAS could be considered as they arise.
135. CCMAS45 also agreed that existing sampling plans would be retained in and/or transferred to CXS 234-1999 in their current form. The EWG would review these sampling plans with a view that they could be included in a database in the future. All comments received from relevant Codex committees would be taken into account in future work.

Conclusion

136. CCMAS45 agreed to:
 - i. re-establish the EWG, chaired by New Zealand and co-chaired by Germany, working in English to:
 - a. review sampling plans and sampling procedures in commodity standards and in CXS 234-1999 for alignment with the *General guidelines on sampling* (CXG 50-2004) and against statistical principles in general;
 - b. consider how sampling plans and sampling procedures could be included in CXS 234-1999, noting the current use of CXS 234-1999 in a paper format and future use of CXS 234-1999 in the form of a database; and
 - c. prepare a report for submission to the Codex Secretariat at least three months prior to CCMAS46.
 - ii. inform all relevant Codex committees of the decision that CXS 234-1999 should be the single reference for methods of analysis and sampling plans and of the ongoing CCMAS work in this regard; and
 - iii. reiterate its previous recommendation to Codex committees that sampling plans should be developed as necessary, and if a committee considered it appropriate to develop sampling plans, they should do so in compliance with CXG 50-2004 and not by reference to CXG 50-2004.

SAMPLING PLANS FOR BULK MATERIALS / HETEROGENOUS LOTS INCLUDING MYCOTOXINS (Agenda item 7.2)¹⁵

137. Germany, as co-chair of the EWG, speaking also on behalf of the Chair, New Zealand, introduced the item and explained that background to the work, the discussions in the EWG, its conclusions and recommendations. The EWG co-Chair further explained that the discussions of CCMAS44 had been communicated to CCCF in line with the decision of CCMAS that any work on sampling plans for bulk materials / heterogenous lots including mycotoxins should be in consultation with CCCF who had the responsibility to develop sampling

¹⁵ CL 2026/6-MAS; CX/MAS 26/45/11; CX/MAS 26/45/11-Add.1 (Comments of Australia, Brazil, Chile, Ecuador, Egypt, European Union, Indonesia, Iraq, Japan, Peru, Türkiye, United Arab Emirates and the International Commission for Uniform Methods of Sugar Analysis (ICUMSA))

plans for relevant provisions for contaminants in foods.

138. The EWG co-Chair explained that the current sampling plans for mycotoxins in bulk commodities in CXS 193-1995 were based on statistical parameters derived from non-randomly selected, contaminated lots. As a result, these parameters might not be appropriate for partially contaminated or inhomogeneous lots, and information on CR and PR were limited. Available tools might underestimate these risks.
139. The EWG co-Chair emphasized that the discussion paper did not challenge the validity of existing sampling plans and did not propose new ones. Instead, it reviewed the theoretical foundations of the current plans, particularly those developed by Whittaker, and examined their relationship to the broader scientific literature, statistical parameters, and the FAO mycotoxins sampling tool. It also outlined possible methods for evaluating existing plans, including utility-based approaches that consider both risks and costs.
140. The EWG had completed its work and developed the discussion paper which concluded that new work was needed to develop guidance, potentially as an annex to CXG 50-2004.
141. CCMAS45 was invited to consider initiating new work to develop general guidance on sampling plans for inhomogeneous bulk materials, with a particular focus on mycotoxins, taking into account the discussion paper.

Discussion

142. CCMAS45 noted that there was general support for the development of general guidance on sampling plans for bulk materials / heterogeneous lots, that this guidance might include practical example(s) addressing mycotoxins, and that the guidance might possibly be included as an annex to CXG 50-2004. However, CCMAS45 agreed that it was premature to initiate new work through the formal Codex process at this stage.
143. The Vice-Chairperson explained that it was not necessary to decide whether to initiate new work on the inclusion of the guidance as an annex to CXG 50-2004 at this stage, as this would not delay the continued development of the discussion paper. A decision could be taken at the next session on the new work and placement of the guidance.
144. A Member emphasized that mycotoxins represented a significant food safety concern, particularly for commodities such as maize, peanuts, and sorghum. In this context, clear, practical, and scientifically sound Codex guidance would strengthen national food control systems and facilitate fair trade. Furthermore, noting that current approaches referred to CXS 193-1995 had limitations in addressing inhomogeneous contamination, The Member expressed its preference that such guidance, if developed, could be included as an annex to CXG 50-2004.
145. CCMAS45 also agreed to continue liaising with CCCF and noted that an option for such communication could be through a side event at CCCF19. It was clarified that the work of CCMAS would remain limited to statistical and theoretical guidance and would not affect the remit of CCCF in developing the actual sampling plan.
146. Members noted that further work was needed to explore the available data in order to better characterize the inhomogeneity of bulk lots, evaluate existing sampling plans in CXS 193-1995 with respect to CR and PR, and identify aspects that might require amendments / revisions to achieve an appropriate balance of these risks. It was noted that the data presented in the discussion paper might not be suitable for this purpose.
147. A Member further indicated that it did not support the use of a utility-based approach for enforcement sampling, as illustrated in the example provided in the discussion paper. Such an approach required prior information on the proportion of contaminated incremental units within a lot and on the variability of aflatoxin concentrations among those units, and this information was typically not available in the context of regulatory enforcement actions.
148. CCMAS45 noted that the EWG would work on gathering more data to inform the further development of the model.

Conclusion

149. CCMAS45 agreed to:
 - i. re-establish the EWG, chaired by New Zealand and co-chaired by Germany, working in English to:
 - a. continue work on a draft guidance on sampling plans for bulk materials / heterogeneous lots including practical examples applicable to mycotoxins, taking into account the discussions in CCMAS45 and any feedback from CCCF; and
 - b. prepare a discussion paper, and if appropriate a project document, for submission to the Codex Secretariat at least three months prior to CCMAS46.
 - ii. inform CCCF of the ongoing discussions in CCMAS and to request feedback on the need for such

guidance and the scope of the work.

HARMONIZATION OF NAMES AND FORMAT FOR PRINCIPLES IDENTIFIED IN CXS 234 (Agenda item 8)¹⁶

150. Brazil, as Chair of the EWG, and speaking also on behalf of the co-Chair, Chile, introduced the item. The EWG Chair recalled that CCMAS44 had considered a discussion paper on the harmonization of names and formats for principles and provisions in CXS 234-1999 and had agreed to re-establish an EWG to continue the work. Given the complexity of the subject, CCMAS44 also agreed to address the harmonization of provisions separately.
151. The EWG reviewed and proposed revisions to the harmonization of names for principles of methods of analysis in CXS 234-1999, focusing on clarifying definitions, aligning terminology with internationally recognized references, and improving the consistency and clarity of analytical principles, acronyms and standard method references. In addition, the EWG examined possible approaches for the harmonization of provisions and identified discrepancies between CXS 234-1999 and relevant commodity standards.
152. The EWG Chair proposed that CCMAS45 review the proposed consolidated structure and text contained in Appendix I and Annexes A, B and C of CX/MAS 26/45/12, with particular attention to the proposed wording and definitions, and consider the retention, inclusion or removal of method principles not currently reflected in CXS 234-1999. The EWG Chair further proposed that Appendix I and its Annexes (Annexes A, B and C) be published as an information document to support the work of CCMAS and other Codex committees submitting methods of analysis, noting that the information document would be a living document subject to update as needed.
153. With respect to the harmonization of provisions, the EWG Chair proposed to consider the approach set out in Annex D of Appendix I as a basis for guiding the continuation of the work.

Discussion

154. Members expressed appreciation for the work undertaken by the EWG. CCMAS45 made the following comments and decisions.

Appendix I: Discussion paper on harmonization of names and format for principles in CXS 234-1999

Section 2 Definitions

155. In response to a question regarding the origin of the definitions included in the document, the EWG Chair explained that definitions accompanied by references had been derived from existing literature or standards, while other definitions had been developed by the EWG where no suitable references could be identified.
156. Noting the existence of a publicly available ISO database containing definitions of analytical terms which were identified in section 2 definitions, CCMAS45 agreed to make a general reference to the relevant ISO definitions by including a link to the ISO Online Browsing Platform (OBP) (<https://www.iso.org/obp/ui/en/>) and in addition, agreed to retain definitions that were not included in the OBP and had been developed by other standards-setting organizations or by the EWG, as follows:
 - Biological assay and titrimetry;
 - Chromatography: the definition quoted from IUPAC;
 - Volumetry: the newly proposed definition, "A technique that determines the volume that a test item occupies".

Section 3.1. Assays whose results are method dependent: bullet point A

157. CCMAS45 agreed with the proposed new text, as follows:

Description in the principle of the predominant method parameters (but not all the method parameters) that makes the result(s) method dependent, if necessary, for example: temperature, conversion factor.

Annex A: Principles of methods of analysis

158. CCMAS45 discussed whether the list of method principles should be limited to those currently included in CXS 234-1999 or expanded to cover a broader range of analytical techniques that could be relevant in the future. Some Members expressed the view that the list should be limited to principles already included in CXS 234-1999, with additions introduced only when new principles were proposed for endorsement, in order to maintain a concise and manageable scope. Other Members considered that a broader list could facilitate harmonization by providing guidance to commodity committees when proposing new methods. CCMAS45 noted that methods

¹⁶ CX/MAS 26/45/12

already included in CXS 234-1999 should be prioritized and agreed to discuss the principles line by line.

159. CCMAS45 made editorial corrections and amendments aimed at ensuring accuracy, including the inclusion of relevant principles following the term “Detector” and the separation of “Flotation” as an individual principle. CCMAS45 also considered the insertion or deletion of certain principles based on those currently included in CXS 234-1999 and their applicability at the laboratory level, including the insertion of Cavity Ring-Down Spectroscopy (CRDS) under Spectroscopy, the deletion of Colorimetry, and the insertion of Argentometry and Alkalimetry under Titrimetry.
160. With regard to the terminology used for thermal decomposition procedures, CCMAS45 noted differing views on the use of the terms “ashing,” “incineration,” and “mineralization,” as well as the temperature ranges associated with these procedures. It was observed that analytical methods specify particular temperatures, which may vary and partially overlap, and that higher temperatures were often referred to as incineration, while lower temperatures were commonly associated with ashing. Members questioned the need to distinguish between multiple terms or to create separate lists, noting that the end product of these procedures was generally ash and that the processes were conceptually similar. It was further noted that, while terms such as “mineralization” could be broader in scope, the need for clarity, simplicity, and consistency in terminology was emphasized, taking into account established usage by international bodies and the practical application of methods. CCMAS45 therefore agreed to use the terminology “incineration” instead of “ashing” or “mineralization”.
161. Regarding whether centrifugation should be considered a method principle or a sample preparation technique, CCMAS45 noted that, while centrifugation had been included in CXS 234-1999, it was primarily used for sample preparation or separation and did not in itself constitute a determination technique for quantifying a component. It was further noted that, although some techniques classified as principles may involve elements of sample preparation, centrifugation was generally applied in combination with other analytical techniques. CCMAS45 agreed that centrifugation should be deleted from the document and that the matter should be further reviewed, with a view to making corresponding corrections to CXS 234-1999.

Annex B: acronyms and abbreviations of principles of methods of analysis

162. CCMAS45 agreed to make corresponding revisions in light of the outcomes of Annex A.

Annex D: Proposed approach for harmonizing provisions in CXS 234-1999

163. Members discussed the harmonization of provisions in the context of the development of a database. It was noted that many existing provisions had been developed by experts over the past ten years for valid technical reasons, and that renaming or revising provisions without clear justification could constitute an overreach and create implementation difficulties.
164. Members expressed support for the establishment of a database and noted that it would be necessary to facilitate the identification and management of similar or related provisions. It was further noted that the development of such a database could be complex, given the large number of existing and new provisions, including provisions expressed using different terminology.
165. The Chairperson noted that the draft text prepared by the EWG addressed the harmonization of pH-related provisions, and that related provisions were considered to refer to the same analytical concept, unless expert advice indicated otherwise. It was further noted that, given the large number of provisions in CXS 234-1999, additional harmonization work would be required, supported by illustrative examples.
166. The Codex Secretariat clarified that issues related to consistency and harmonization of provisions could be addressed at different levels, noting that some matters were of a straightforward editorial nature and could be addressed without amending commodity standards, while other issues would require consultation and, where appropriate, amendments to relevant texts.
167. CCMAS45 noted that the work should continue through an EWG, under clear terms of reference.

Conclusion

168. CCMAS45 agreed to:
 - i. publish, as an information document, the document entitled *Harmonization of names and format for principles in CXS 234-1999, with Principles of methods of analysis, Acronyms and abbreviations of principles of methods of analysis, and List of acronyms for standard method references* included as three appendices to the information document (Appendix VI);
 - ii. include the documents *Acronyms and abbreviations of principles of methods of analysis* and *List of acronyms for standard method references* in CXS 234-1999; and
 - iii. inform the commodity committees and the Regional Coordinating Committees (RCCs) of the

availability of the information document and to request that it be used when submitting methods for endorsement.

169. CCMAS45 further agreed to establish an EWG chaired by Chile, co-chaired by Brazil, working in English, to:
- i. propose a harmonization of the provisions along CXS 234-1999 following the steps:
 - a. identify the provisions where amendments are not necessary, or just editorial modification.
 - b. identify information that is placed in the name of the provision, but is not necessary or is related with the name of the commodity or additional information related to the method, and suggest where to place the information, if it is necessary.
 - c. compare the name of the provision in CXS 234-1999 with the name in the commodities standards and in case of inconsistency, suggest how to address it, considering if it is an active or an inactive committee.
 - d. group the provisions according to their characteristics and assess if it is possible harmonize them; and
 - e. identify the Committees that should be consulted and inform them of the inconsistency and request for their opinions, if necessary.
 - ii. revise CXS 234-1999 using the harmonized names and formats of the principles and present a revised version to CCMAS46 for consideration; and
 - iii. to submit its report to the Codex Secretariat at least three months prior to CCMAS46.

REPORT OF AN INTER-AGENCY MEETING ON METHODS OF ANALYSIS (Agenda item 9)

170. The Observer from the MoniQA Association (MoniQA), speaking as Chair of the inter-agency meeting (IAM), introduced the report of IAM-36 described in CRD04. The Observer highlighted several topics from CRD04 of relevance to the work of CCMAS that were discussed in the IAM:
- Review of methods submitted by CCSCH and CCFO;
 - Retyping of the ISO 1871 method for protein determination in quinoa;
 - Methods of analysis for precautionary allergen labelling; and
 - Harmonization of names and format for principles identified in CXS 234-1999.
171. The Observer also stressed that the IAM had requested that SDOs should notify Codex when methods are changed/updated in accordance with the Information Document: Guidance on Process for Submission, Consideration and Endorsement of Methods, noting that due to differing cycles between SDOs in updating methods, methods that were initially technically identical may become out of sync over time. The Observer noted that SDOs could be contacted during the preparation of standards for both methodological and statistical advice.
172. CCMAS45 noted that several of the issues raised in CRD04 were considered under relevant agenda items.

Conclusion

173. CCMAS45 thanked the members of IAM for their valuable contribution to the work of CCMAS and Codex.

OTHER BUSINESS AND FUTURE WORK (Agenda item 10)

Activities of the Joint FAO/IAEA Centre relevant to the work of CCMAS

174. The Representative of the Joint Centre informed CCMAS that the Food Safety and Control Section (FSCS) of the Joint FAO/IAEA Centre contributes to strengthening global food safety and authenticity by promoting the use of nuclear and related analytical techniques. Its activities support Member States in improving food control systems, facilitating fair trade, and enhancing laboratory capacities through targeted capacity building and technology transfer. The FSCS applies a complementary analytical approach that integrates rapid screening methods with high-precision confirmatory techniques. These are used to detect contaminants and residues, verify geographical origin, and identify food fraud. The approaches include spectroscopic techniques, chromatography coupled with mass spectrometry, isotope ratio analysis, gas chromatography–ion mobility spectrometry, and immunosensor-based methods. Recent research and method development focus on areas such as the authentication of fish and olive oil, the detection of adulteration in honey and fruit juices, the analysis of mycotoxins, and studies on veterinary drug depletion using radiolabelled compounds. The FSCS also ensures that research outputs are translated into practical applications through coordinated research projects, technical cooperation activities, training initiatives, and scientific publications.

175. The Representative noted that these efforts directly supported CCMAS priorities by advancing analytical method development, promoting harmonization and standardization, strengthening interlaboratory comparisons, and providing scientific input relevant to the food safety risk assessment and Codex standard-setting processes.

Conclusion

176. CCMAS45 noted the information provided and expressed its appreciation to the Joint FAO/IAEA Centre for their interest in and support of the work of CCMAS.

Development of methods of analysis for microplastics in food-grade salt

177. The Republic of Korea, referring to CRD05, informed CCMAS that microplastics have emerged as contaminants of global concern, particularly in sea salt, which was produced directly from marine environments. Several studies had reported the presence of microplastics in commercial food-grade salts; however, analytical approaches varied considerably, limiting the comparability of results. Key analytical challenges included differences in sample preparation procedures, particle size thresholds, and analytical techniques. It was also noted that analytical methods for microplastics in drinking water were currently under discussion within ISO.
178. The Member recalled that reliable and comparable analytical data would therefore be important for any future consideration of microplastics in food, and harmonization of analytical approaches might be beneficial. CCMAS45 was invited to note this emerging analytical issue and to recognize the potential value of collaborative work on analytical method development in this area.
179. There was general agreement that microplastics (and nanoparticles) in foods, including drinking water, represented an emerging issue of concern and posed significant analytical challenges.
180. Attention was drawn to:
- the recent guidance published by the UK National Measurement Laboratory (CRD**).
 - ISO standards for microplastics in drinking water and the environment, and that possible ISO standards for microplastics in food were under discussion; and
 - the offer from AOAC to assist with standardization efforts in this area.
181. CCMAS45 noted that no Codex standards currently existed and that CCMAS was therefore not able to consider methods of analysis at this time. CCMAS further noted the ongoing work of SDOs and other bodies and agreed that developments could be followed through the IAM. CCMAS45 agreed that once relevant Codex standards are developed, CCMAS would be ready to assist in the identification of appropriate methods of analysis.

Conclusion

182. CCMAS45 thanked the Republic of Korea for bringing this emerging issue to the attention of CCMAS and noted the ongoing work by SDOs in this area.

DATE AND PLACE OF THE NEXT SESSION (Agenda item 11)

183. CCMAS45 was informed that its 46th Session was tentatively scheduled to take place from 10-14 May 2027 in Budapest, Hungary, with the final arrangements subject to confirmation by the Host Country in consultation with the Codex Secretariat.