

# CODEx ALIMENTARIUS COMMISSION



Food and Agriculture  
Organization of the  
United Nations



World Health  
Organization

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Agenda item 16

CX/CF 24/17/16-Add.1

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ORIGINAL LANGUAGE ONLY

**JOINT FAO/WHO FOOD STANDARDS PROGRAMME**

**CODEx COMMITTEE ON CONTAMINANTS IN FOODS**

**17<sup>th</sup> Session**

**15-19 April 2024**

**Panama City, Panama**

**DEVELOPMENT OF A CODE OF PRACTICE FOR THE PREVENTION  
AND REDUCTION OF CADMIUM CONTAMINATION IN FOODS**

**Comments in reply to CL 2024/26-CF**

submitted by

Canada, Chile, Cuba, Ecuador, Egypt, Iraq, Jamaica, Japan,  
New Zealand, Panama, Peru, United Arab Emirates, USA and IFT

## **Background**

1. This document compiles comments received through the Codex Online Commenting System (OCS) in response to CL 2024/26-CF<sup>1</sup> issued in January 2024. Under the OCS, comments are compiled in the following order: general comments are listed first, followed by comments on specific sections.

## **Explanatory notes on the appendix**

2. The comments submitted through the OCS are hereby annexed and presented in tabulated format.

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<sup>1</sup> <https://www.fao.org/fao-who-codexalimentarius/resources/circular-letters/en/>  
<https://www.fao.org/fao-who-codexalimentarius/committees/committee/related-circular-letters/en/?committee=CCCF>

**ANNEX****GENERAL COMMENTS**

<b>COMMENT</b>	<b>MEMBER / OBSERVER</b>
<p>Chile revisó las recomendaciones de esta carta circular y el documento CX/CF 24/17/16. Al respecto, Chile quisiera emitir los siguientes comentarios:</p> <ul style="list-style-type: none"> <li>- Chile considera que existe suficiente información disponible sobre las fuentes de cadmio y las medidas de mitigación, sobre la base de la información proporcionada por el documento revisado y por lo tanto apoya la recomendación de elaboración de este Código de Prácticas.</li> <li>- Chile considera apropiado el desarrollo de anexos para este Código de Prácticas, y está de acuerdo en adaptar el actual Código de prácticas para prevenir y reducir la contaminación por cadmio en los granos de cacao, como anexo. Muchas gracias.</li> </ul>	<b>Chile</b>
<p>Con base en la información proporcionada en los apéndices I y III, se considera que es importante iniciar los trabajos para elaboración del Código de Prácticas (CdP), para prevenir y reducir la contaminación por cadmio en los alimentos; así mismo, en virtud de la biodisponibilidad del cadmio a lo largo de los diferentes procesos productivos, consideramos pertinente desarrollar información específica para cada producto (anexos), sin embargo, se debería considerar como prioritario la elaboración de este código de prácticas.</p>	<b>Ecuador</b>
<p>Egypt appreciates the work done Prepared by the United States of America to prepare this document. Egypt recommends not developing the Code of Practice due to insufficient data provided.</p>	<b>Egypt</b>
<ol style="list-style-type: none"> <li>1. Jamaica wishes to know if there are any other known measures to reduce/ prevent cadmium contaminants in foods outside of those provided in the 2022 approved CoP for the reduction / prevention of cadmium in cocoa beans.</li> <li>2. If there are no additional measures there is no need to develop a new CoP for prevention / reduction of Cadmium in foods.</li> <li>3. With regards to the proposed ML for Cadmium in Quinoa being much lower than the level in cocoa 0.6 mg/kg to 0.7 mg/kg. Why the difference in the commodities why ML levels differ?</li> </ol>	<b>Jamaica</b>
<p>Japan supports a new work on a Code of Practice for the Prevention and Reduction of Cadmium Contamination in Foods since there is sufficient information available on cadmium sources and mitigation measures in foods. In addition to the information in Appendices I to III of CX/CF 24/17/16, collecting further information on practical measures implemented in industry through a circulate letter will make the development of the Code of Practice more effective.</p> <p>The development and implementation of the Code of Practice at the international level by Codex will lead to a significant reduction in consumer exposure by reducing the concentration of cadmium in internationally traded foodstuffs.</p> <p>As for the need for development of annexes to a COP, Japan is of the opinion that commodity-specific annexes are not necessary at this stage. The Code of Practice for Prevention and Reduction of Mycotoxin Contamination in Cereals (CXC 51-2003) includes annexes by type of mycotoxins, but not by commodities. We suggest that the Code of Practice will be developed with the goal of a cross-commodity COP, like the Code of Practice for the Prevention and Reduction of Lead contamination in foods (CXC 56-2004), and that additional annexes can be considered, if necessary, when sufficient information for commodity-specific mitigation measures becomes available.</p>	<b>Japan</b>

<p>On the Code of Practice for the Prevention and Reduction of Cadmium Contamination in Cocoa Beans (CXC 81-2022), Japan suggests it should be maintained as a separate document for the time being as the COP has only recently been adopted and each producing country is in the process of implementing the COP. Some overlap between the COP for cocoa beans and the general COP proposed as a new work would not be a problem.</p> <p>Japan proposes some amendments to the project document for new work. See comments to Appendix II of CX/CF 24/17/16 for more information.</p>	
<p>New Zealand's comments on Appendix III;</p> <ul style="list-style-type: none"> <li>• para 14 p.9; "Because cadmium uptake in crops is influenced by soil properties, including pH, organic carbon and zinc content, cation exchange capacity, clay content, and oxides of Fe, Al, and Mn, it is important that soil testing be conducted to assess mitigation options if cadmium levels in crops, are a concern".</li> </ul> <p>New Zealand suggests inserting 'of these properties' after 'soil testing' .... or 'of these properties – particularly pH, organic carbon, zinc' to allow for a smaller suite of additional properties to be tested.</p> <ul style="list-style-type: none"> <li>• para 22 p.9; "When there is a deficiency of zinc in the soil, soil zinc levels should be increased. Cadmium competes with zinc for uptake by plant, and cadmium is more likely to enter crops and accumulate in plants when zinc soil concentration is low."</li> </ul> <p>New Zealand would like to note that there are studies which show reduced cadmium as a result of foliar zinc applications – they don't discuss mechanism but potentially it influences internal movement as well.</p> <p>New Zealand suggests para 22 should be rephrased as appropriate to say 'when there is a deficiency of zinc in plants, zinc levels should be increased via either soil or foliar application. Cadmium competes with zinc for uptake by plant, and cadmium is more likely to enter crops and accumulate in plants when zinc soil concentration is low. Studies on foliar application of zinc, also show reduced cadmium in plants. ...</p> <p>Some selected references can be found below:</p> <ul style="list-style-type: none"> <li>o Lu et al., 2024 - Cadmium (Cd) Minimization and Zinc (Zn) Biofortification in Wheat (Triticum aestivum L.) Grains by Spraying with the Foliar Zn Fertilizer in Cd-Contaminated Fields, <a href="https://www.mdpi.com/2073-4395/14/1/18">https://www.mdpi.com/2073-4395/14/1/18</a></li> <li>o Poblaciones et al., 2017 - Foliar zinc biofortification effects in Lolium rigidum and Trifolium subterraneum grown in cadmium-contaminated soil, <a href="https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0185395">https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0185395</a></li> <li>o Oliver et al., 1997 - Effect of soil and foliar applications of zinc on cadmium concentration in wheat grain, <a href="https://www.publish.csiro.au/an/EA97017">https://www.publish.csiro.au/an/EA97017</a></li> </ul>	<b>New Zealand</b>
<p>In general, New Zealand supports the development of annexes to a CoP for the prevention and reduction of cadmium in food prior to the revision of the cadmium MLs, as it might not be realistic to develop one CoP for all major crops. However New Zealand would like to note that it might not be feasible to develop annexes to a CoP for certain crops as there are no obvious mitigations for many crops, and data is lacking on what conditions will lead to cadmium concentrations in certain crops.</p> <p>The CoP needs to be mindful of regional and country variability. Furthermore, the CoP should not place significant burden and costs on food producers.</p>	<b>New Zealand</b>

<p>El Perú agradece al grupo de trabajo electrónico, presidido por Estados Unidos, por el esfuerzo emprendido a la fecha y al trabajo realizado electrónicamente que se encuentran plasmados en el Apéndice I, II y III del documento CX/CF 24/17/16 que figura en la página web de la 17.<sup>a</sup> reunión del Comité del Codex sobre Contaminantes de los Alimentos (CCCF), y en atención y respuesta al documento CL 2024/26-CF Perú expresa su apoyo para recomendar la elaboración de un Código de prácticas (CdP) para prevenir y reducir la contaminación por cadmio en los alimentos y como anexo se podrían contener recomendaciones específicas para cada producto como son el caso del Código de prácticas para prevenir y reducir la contaminación de los cereales por micotoxinas (CXC 51-2003), así como el Código de prácticas para la prevención y reducción de la contaminación por cadmio en granos de cacao (CXC 81-2022).</p>	Peru
<p>Regarding the request for submit comments on the recommendations for the development of a Code of practice for the prevention and reduction of Cadmium contamination of food CX/CF 24/17/16 Appendix 1 paragraph 7-10, United Arab Emirates, suggests issuing a circular letter (CL) to further develop the Cop by an electronic working group, to be established by CCCF17 if there is agreement to develop the Cop for consideration by CCCF18 2025</p>	United Arab Emirates
<p>The IFT welcomes science-based standards for chemical contaminants in food, that protect health from dietary exposure based on scientific risk assessment, and that are reasonably achievable globally, based on occurrence data, new data on the impact on human health of such contaminants, development of new technologies to mitigate their occurrence, and following established and realistic best production practices.</p>	IFT

#### SPECIFIC COMMENTS

<p><b>Codex Members and Observers are invited to submit comments on the recommendations as described in CX/CF 24/17/16, Appendix I, paragraphs 7-11, which are described below for convenience:</b></p> <ul style="list-style-type: none"> <li>• <b>to consider if there is sufficient information available on cadmium sources and mitigation measures, based on the information provided in Appendices I and III, to recommend development of a Code of Practice for the Prevention and Reduction of Cadmium Contamination in Foods.</b></li> <li>• <b>If agreeable to develop the CoP, to consider the need for development of annexes to a CoP that could contain commodity-specific recommendations, similar to the Code of Practice for the Prevention and Reduction of Mycotoxin Contamination in Cereals (CXC 51-2003).</b></li> <li>• <b>If use of annexes is supported:</b></li> <li>• <b>to advise on whether the recently completed Code of Practice for the Prevention and Reduction of Cadmium Contamination in Cocoa Beans should be maintained as a separate document or adapted as an annex.</b></li> <li>• <b>to indicate if there is any adjustment that would be needed to the approach outlined in Appendix III, in order to support the use of commodity-specific annexes.</b></li> </ul> <p><b>Based on these recommendations, proceed to:</b></p> <ul style="list-style-type: none"> <li>• <b>review the project document accordingly as presented in CX/CF 24/17/16, Appendix II; and</b></li> <li>• <b>advise on the opportunity to issue a circular letter (CL), following CCCF17, to further develop the CoP by an electronic working group, to be established by CCCF17 if there is agreement to develop the CoP, for consideration by CCCF18 (2025).</b></li> </ul>
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<p>The United States considers that there is sufficient information available on cadmium sources and mitigation measures to recommend development of a Code of Practice for the Prevention and Reduction of Cadmium Contamination in Foods based on the information presented.</p> <p>The United States supports the issuance of a Circular Letter to further develop a CoP for consideration by CCCF18 (2025).</p> <p>The United States supports development of annexes that could contain commodity-specific recommendations. The responses to the Circular Letter and information from an EWG for CCCF18 would help identify potential annexes and inform whether the CoP for the Prevention and Reduction of Cadmium Contamination in Cocoa Beans should remain a separate document or be adapted as an annex.</p>	<b>USA</b>
<p>Bullet 1: Canada supports recommending the development of a CoP. The proposed information in the discussion paper covers a wide range of food commodities that could be contaminated by cadmium, as well as practical mitigation measures.</p> <p>Cadmium management is relevant to the following foods from Canada that are known to have the potential to accumulate cadmium: oysters and other shellfish from the Pacific northwest, seaweed, flax/linseed, durum wheat and soybeans.</p> <p>Bullet 2: Canada supports including commodity-specific annexes in a new CoP on cadmium in foods. A single CoP would eliminate redundancy of some background information (e.g. sources of cadmium, cadmium toxicity) in multiple CoPs.</p> <p>As the commodities vary greatly in how they are grown and/or produced (e.g. agricultural commodities versus seafoods), commodity-specific annexes seem reasonable and would be comparable to the mycotoxin-specific annexes in CXC 51-2003.</p> <p>In order to make apparent what information is included in the annexes, the title of a new CoP could list the food commodities for which annexes exist.</p> <p>Bullet 4: Canada supports merging the existing CoP on cocoa beans (CXC 81-2022) into a new overall cadmium CoP.</p> <p>Bullet 5: If CCCF17 supports the development of a CoP as new work, then Canada would support that an EWG be established. As part of the EWG, information can be solicited to help guide the organization of the CoP in order to include commodity-specific annexes. Information in annexes should aim to minimize redundancy with information in the body of the document.</p> <p>Ideas for incorporating annexes into a CoP should be gleaned from Codex CoP CXC 51-2003 (mycotoxins in cereals), which includes mycotoxin-specific annexes.</p> <p>Bullet 6: The project document is complete, comprehensive and of appropriate scope.</p> <p>Bullet 7: Canada supports issuing a circular letter to support the development of the CoP by an EWG in advance of CCCF18.</p>	<b>Canada</b>
<p>Cuba agradece la oportunidad de responder a la carta circular CL2024/26-CF y en principio considera que sería muy importante que el Codex elabore este documento que sirva como Buena Práctica a seguir por los productores de los diferentes países, además consideramos que pudiera valorarse la posibilidad de que el código posea los anexos recomendados.</p>	<b>Cuba</b>

<p>-Considering the recommendations outlined in CX/CF 24/17/16 and reviewing the proposals in the Discussion Paper, IFT would make the following comments:</p> <p>IFT believes there is sufficient information available on cadmium sources and mitigation measures and recommends CCCF 17 begin work to develop a Code of Practice (COP) for the prevention and reduction of cadmium contamination in foods.</p> <ul style="list-style-type: none"> <li>· Based on the various technologies that could be used for mitigation that are related to the food product in question, IFT would recommend annexes be developed that are commodity specific beneath an over-arching COP.</li> <li>· IFT would support the inclusion of the COP recently developed for cadmium mitigation in Cocoa Beans as an annex to the COP that would be developed for the prevention and reduction of cadmium contamination in foods.</li> <li>· IFT believes that there are adjustments needed in the approach outlined in Appendix III. Specifically, IFT would highlight the following proposed modifications by paragraph in Appendix III. <ul style="list-style-type: none"> <li>o 1. IFT would recommend the inclusion of neurological effects to the list of human health issues based on recent scientific studies (See References 1,2 below). Additionally, IFT would recommend the inclusion of a statement in this section regarding the heightened health impacts for those most vulnerable to the effects of cadmium consumption (pregnant and lactating women, infants and young children, those with certain nutritional deficiencies such as for iron and zinc) as recent scientific research indicates that those vulnerable populations are at heightened risk.</li> <li>o 6. IFT believes this paragraph should be expanded and include mention of these additional commodities and processed foods as being of concern based on a recent review of the US FDA Total Dietary Survey (TDS) data, the drive for increasingly plant-based diets, and frequency of consumption for various food types: leafy vegetables, wheat, root and tuber vegetables.</li> <li>o 11. IFT would highlight that it is not just the absolute level of cadmium in a food that is of concern, but also frequency of consumption, particularly for the most vulnerable populations.</li> <li>o 15. IFT would add to this point that planting of crops with high population consumption rates and even moderate uptake is also of concern.</li> <li>o 21. IFT would highlight that while soil pH adjustment can be a helpful mitigation strategy for cadmium uptake, it can also impact the development of certain, valuable nutritional components of a plant (e.g., various phytochemicals) and that it is useful to understand the impact of such adjustments to nutritional profiles of various crops.</li> <li>o 23. IFT would suggest further elaborating on the importance of the soil microbiome in helping plants mitigate heavy metal uptake when stressed. (Rai P.K., Lee S.S., Zhang M., Tsang Y.F., Kim K. Heavy metals in food crops: Health risks, fate, mechanisms, and management. Environ. Int. 2019; 125:3365–3385. o 45. While IFT agrees with this point, we believe that Codex should revisit the existing standards for cadmium in foods established in the 2001-2006 timeframe in light of the substantial scientific research on the impacts on human health of cadmium intake conducted since that time, particularly for the most vulnerable populations (pregnant women, infants and children). Additionally, the impact of nutritional deficiencies on enhanced cadmium uptake for those vulnerable populations further warrants these standards to be revisited by CCCF and JECFA.</li> <li>o 48/49. While IFT agrees with these points, we believe that most children begin transitioning to foods consumed by the general population between 1-3 years of age, so the consideration of sourcing of food not strictly targeted to children is also a substantial concern, particularly considering nutritional deficiencies that can enhance cadmium uptake by them substantially above the studies done on adult populations that were the basis for the current Codex standards.</li> </ul> </li> </ul>	<p><b>IFT</b></p>
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<p>o 52. While IFT agrees with the inclusion of this mitigation strategy on milling, we caution that it runs counter to the promotion and benefits of whole grain fiber in the diet. Therefore, while we agree this point should be highlighted, we encourage additional elaboration about the nutritional trade-offs in the human diet and advocate for strategies that do not involve reduction in important nutrients where possible. Additionally, IFT would suggest highlighting new milling technologies that can assist processors with sorting out high cadmium and other heavy metal containing raw materials (e.g., grains, seeds and legumes) to target more intense milling of outer (bran) layers for removal in those raw materials higher in cadmium or other heavy metals.</p> <p>ADDITIONAL COMMENTS</p> <p>IFT would like to highlight three important additional considerations regarding the proposal.</p> <p>o There is no detailed discussion on the importance of leveraging crop genetic technologies to help develop varieties that would have lower levels of uptake. We would highlight that traditional plant breeding techniques as well as gene-editing tools (e.g., CRISPR technology) could be very helpful in developing crop varieties that resist the uptake of cadmium.o Food processing steps can both help mitigate (e.g., washing, cooking &amp; leaching out components in the cook water) or enhance (baking, drying, otherwise concentrating) cadmium content in foods. We believe this point should be made under that section and elaborated upon.</p> <p>o There is no mention in the food processing section of the use of separations technology in liquid food systems (e.g., fruit juices) for removal of cadmium (or other heavy metals) from a food product. We believe that reference should be added to the document regarding this.</p> <p>References</p> <ol style="list-style-type: none"> <li>1. Gustin K, Tofail F, Vahter M, Kippler M. Cadmium exposure and cognitive abilities and behavior at 10 years of age: A prospective cohort study. Environ Int. 2018; 113:259–268.</li> <li>2. Chandravanshi L, Shiv K, Kumar S. Developmental toxicity of cadmium in infants and children: a review. Environ Anal Health Toxicol. 2021 Mar;36(1)</li> </ol>	
<b>PROJECT DOCUMENT</b>	
<p>Agree</p>	<b>Iraq</b>
<p>Panama appreciates the work carried out and agrees with the document presented and its content, we consider it important to advance this work to its next stage.</p> <p>Panamá agradece el trabajo realizado y está de acuerdo con el documento presentado y del contenido del mismo, consideramos importante el avance de este trabajo a su siguiente etapa.</p>	<b>Panama</b>
<p>The purpose of the proposed new work is to develop a code of practice (CoP) to prevent or reduce cadmium contamination in foods. The scope of the work encompasses <u>prevention and reduction measures</u> of cadmium contamination during agricultural and aquacultural production and food processing, preparation, packaging, and transport.</p> <p>Between 2018 and 2022, CCCF adopted maximum levels (MLs) for cadmium in chocolate containing or declaring &lt;30%, ≥ 30% to <del>≤50%</del>&lt;50%, ≥ 50% to &lt; 70%, and ≥ 70% total cocoa solids, and 100% cocoa powder, as well as the <i>Code of Practice for the Prevention and Reduction of Cadmium Contamination in Cocoa Beans</i>.</p>	<b>Japan</b>

<p>The new work aims to reduce exposures that may cause exceedance of the PTMI, through the development <u>and implementation</u> of a CoP that covers cadmium contamination in a range of foods in addition to cocoa beans.</p>	
<p>This work will address measures, supported by scientific data, that prevent or reduce cadmium contamination. Measures to be addressed may include agricultural techniques (e.g. fertilization, irrigation), source-directed measures (reduction of cadmium in soil and water), and food processing modifications (e.g. use of filtration aids in juices and washing techniques for seaweed). <u>This work will also address consumer advice.</u></p> <p>Japan supports including a consumer advice as already incorporated in Appendix III of CX/CF 24/17/16.</p>	
<p>This work will address measures, supported by scientific data, that prevent or reduce cadmium contamination. Measures to be addressed may include agricultural techniques (e.g. fertilization, irrigation), source-directed measures (reduction of cadmium in <u>agricultural</u> soil and water), and food processing modifications (e.g. use of filtration aids in juices and washing techniques for seaweed).</p>	
<p>This work will address <u>practical</u> measures, supported by scientific data, that prevent or reduce cadmium contamination. Measures to be addressed may include agricultural techniques (e.g. fertilization, irrigation), source-directed measures (reduction of cadmium in soil and water), and food processing modifications (e.g. use of filtration aids in juices and washing techniques for seaweed).</p>	
<p>Development of a CoP is needed to ensure that information on recommended practices for preventing and reducing cadmium exposures is available to all member countries. It also will provide the means to enable exporters to ensure reduced cadmium levels and to assist in compliance with any current <u>Codex</u> MLs and those that may be established in the future.</p>	
<p>The CoP will provide measures to reduce cadmium in food, as it will address all aspects of food production from <del>agricultural</del> <u>agricultural/aquacultural</u> production to processing to packaging and <del>transport</del> <u>transport and consumption</u>.</p>	
<p>Health-based guidance that address cadmium exposures have been developed for workplaces, for drinking water (e.g. WHO), <del>and for agriculture (e.g. United Kingdom's Code of Agricultural Practice for Farmers, Growers, and Land Managers).</del></p> <p>Japan proposes the last example to be deleted because it is not a work of international organizations.</p>	
<p>Health-based guidance that address cadmium exposures have been developed for <del>workplaces,</del> <u>workplaces and</u> for drinking water (e.g. WHO), and for agriculture (e.g. United Kingdom's Code of Agricultural Practice for Farmers, Growers, and Land Managers).</p>	
<p>Cadmium MLs have been established for a variety of foods in the GSCTFF (CXS193-1995) (e.g. chocolate and cocoa products, vegetables, grains, seafood, salt) without a CoP being available. <u>Code of Practice Concerning Source Directed Measures to Reduce Contamination of Foods with Chemicals (CXC 49-2001)</u> is also encompassing measures relating to cadmium.</p> <p>The existing CoP for source direct measures is also an important related document to the proposed CoP.</p>	