CODEX ALIMENTARIUS COMMISSION

Food and Agriculture Organization of the United Nations

World Health Organization

Viale delle Terme di Caracalla, 00153 Rome, Italy - Tel: (+39) 06 57051 - E-mail: codex@fao.org - www.codexalimentarius.org

Agenda Item 12 **CX/PR 23/54/14-Add.1**

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON PESTICIDE RESIDUES

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MONITORING THE PURITY AND STABILITY OF CERTIFIED REFERENCE MATERIAL OF MULTICLASS PESTICIDES DURING PROLONGED STORAGE

Comments in reply to CL 2023/38-PR

Comments of Brazil, Canada, Chile, Cuba, Egypt, Ghana, Indonesia, Iraq, Japan, Kenya, Saudi Arabia, Singapore, Uruguay, United States of America (USA), International Commission for Uniform Methods of Sugar Analysis (ICUMSA)

Background

1. This document compiles comments received through the Codex Online Commenting System (OCS) in response to CL 2023/38-PR[1] issued in April 2023. 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.

[1] 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=CCPR

Annex

GENERAL COMMENTS

COMMENT	MEMBER/OBSERVER
Brazil supports the recommendations for the development of guidance on monitoring the stability of reference material purity of pesticides during prolonged storage.	**Brazil**
Canada supports the eWG recommendations to CCPR54 to: (i) consider the proposal for new work on monitoring the stability of reference material purity of pesticides during prolonged storage. (ii) review the outline of the proposed new work and provide general guidance for the further development of the document, if agreement is reached to proceed with the new work; and if so, (iii) establish an EWG to prepare guidance on monitoring the stability of reference material purity of pesticides during prolonged storage based on the outline provided for consideration by CCPR55 (2024). Canada will continue to support and participate in the development of the guidelines in the eWG, if the new work is approved.	**Canada**
Considerar si en el documento de debate del Apéndice I se proporcionan suficientes datos/información que respalden la elaboración de directrices para el seguimiento de la estabilidad de la pureza del material de referencia de los plaguicidas durante el almacenamiento prolongado; en caso negativo, proporcionar observaciones generales sobre puntos adicionales que deberían tenerse en cuenta en el documento de debate, nuevas mejoras de la información actual, etc. que podrían orientar la labor del Grupo de trabajo por medios electrónicos en caso de que el CCPR lo vuelva a establecer. Chile considera que se cumple con el objetivo de entregar las directrices generales para el desarrollo de un trabajo posterior.	**Chile**
Cuba agradece la oportunidad de responder a la carta circular CL 2023/38-PR y apoya el documento que esta a disposición de comentarios	**Cuba**
Egypt agrees on the proposed draft of the guidance on monitoring the stability of reference material purity of pesticides during prolonged storage and suggests the following: – Amending the definition of (CRM) to be as mentioned in ISO Guide No. 30/2015 (which was mentioned in references to the Codex document no. 38) to be as follows: Is Reference material (RM) characterized by a metrologically valid procedure for one or more specified properties, accompanied by an RM certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability – Determine the groups of pesticides to which this guide will be applied.	**Egypt**
Ghana supports the discussion paper in Appendix I and the proposal for a new work in Appendix II. We agree that it provides sufficient data/information that support the development of guidance on monitoring the stability of reference material purity of pesticides during prolonged storage. We hope this guidance will help to reduce the high recurring cost of procuring new RMs by the laboratories working in the field of multi-pesticide residue analysis and the disposal of the expired RMs which is also a major environmental challenge globally. Ghana agrees with the establishment of an EWG to prepare guidance on monitoring the stability of reference material purity of pesticides during prolonged storage based on the outline provided in Appendix III for consideration by CCPR55 (2024).	**Ghana**

COMMENT	MEMBER/OBSERVER
Participation in the proficiency testing (PT) programme for pesticides in defined sample matrices diminishes the importance of the validation of the purity of expired CRMs. It should be specific. The variability of the test results will be greater due to the inhomogeneity of the sample matrix, sample preparation, analytical methods, and so on, rather than the variability related to the purity of the standard itself. According to de Kok et al.(2019), it is recommended that stability experiments be conducted under conditions of repeatability and that validation be conducted intra-laboratory in order to reduce the variability of test results.	**Indonesia**
Agree with no comments	**Iraq**
Consider whether the discussion paper in Appendix I provides sufficient data/information that support the development of guidance on monitoring the stability of reference material purity of pesticides during prolonged storage, if not, provide general comments on additional points that should be considered in the discussion paper, further improvements to current information, etc. that could guide the work of the Electronic Working Group if re-established by CCPR. Regarding "KNOWLEDGE GAPS AND CHALLENGES" in appendix 1, add a new paragraph after para 12. (para 12bis) If the use of expired RMs is considered as a part of quality assurance for laboratories, the matter should be referred to CCMAS, whose ToR includes to define procedures, protocols, guidelines or related texts for the assessment of food laboratory proficiency, as well as quality assurance systems for laboratories. (Reason) CCPR may work on the stability of RM for pesticide residues as clarified by Codex secretariat, but matters related to the quality assurance for laboratories should be considered by an appropriate committee, CCMAS, with the abovementioned ToR (g). Note that ToR(g) of CCMAS does not have exception.	**Japan**
Comment: Kenya is in agreement with the recommendations of the EWG and agrees with the establishment of the EWG to prepare guidance on monitoring the stability of reference material (RM) purity of pesticides during prolonged storage. Justification: This will address the challenges and the gaps that were raised by the EWG.	**Kenya**
Saudi Arabia support the recommendations for the development of guidance on monitoring the stability of reference material purity of pesticides during prolonged storage.	**Saudi Arabia**
In general, Singapore supports the proposal for a new work on the development of guidance on monitoring the stability of reference material purity of pesticides during prolonged storage, in consideration that the information provided in the discussion paper (Appendix I) contains sufficient scientific justification on the need for a harmonised approach for monitoring the stability of pesticide reference materials (RMs) for purpose of extending the use of RMs beyond the expiry dates recommended by their suppliers. Singapore is of the view that, to be consistent with the TORs of the e-WG laid down at the 52nd CCPR, the scope of the proposed new work should be expanded beyond the pesticide reference materials, to also cover the related stock solutions and working solutions, since it is the latter that would be used for constructing calibration curves, hence having direct impact on the accuracy of pesticide residues test results. Having good way of monitoring the stability of pesticide RMs but falling short in monitoring the stability of pesticide stock solutions and working solutions would still risk in reporting inaccurate pesticide residues analytical results. Singapore's specific comments on the Appendices are provided as below.	**Singapore**

COMMENT	MEMBER/OBSERVER
Consider whether the discussion paper in Appendix I provides sufficient data/information that support the development of guidance on monitoring the stability of reference material purity of pesticides during prolonged storage, if not, provide general comments on additional points that should be considered in the discussion paper, further improvements to current information, etc. that could guide the work of the Electronic Working Group if re-established by CCPR. Singapore's Comments on Appendix I 1. To capture the existing guidance for possibility of extending the expiry date of pesticide reference standards beyond the suppliers' expiry date, we propose to insert a new paragraph between the existing paragraph 2 and 3, i.e., to add a new paragraph 3 which reads as follow (note: with the addition of the new paragraph 3, the last sentence of paragraph 9 about the SANTE/11312/2021 may be deleted): Similarly, under SANTE/11312/2021 'Analytical Quality Control and Method Validation Procedures for Pesticide Residues Analysis in Food and Feed', it is stated that pesticide standards should be stored at low temperature, preferably in a freezer, with light and moisture excluded. Under such conditions, the supplier's expiry date, which is often based on less stringent storage conditions, may be replaced, as appropriate for each standard, by a date allowing for storage up to 10 years. This way the reference standard may be retained, and a new expiry date may be allocated, providing that it is checked by the appropriate date and its purity is shown to remain acceptable. 2. Existing paragraph 4, line 4: suggest to add the full name of RMPs 'reference material providers' in front of RMPs to be clearer. 3. Existing paragraph 10, line 2: suggest to add 'by RMPs' after 'The date of expiry recommended'. 4. Existing paragraph 10, line 4: suggest to replace 'expired RMs' with 'RMs passing the expiry date recommended by RMPs' 5. Existing paragraph 11, line 3: suggest to add 'date recommended by RMPs' after 'beyond their expiry' 6. Existing paragraph 12: in view of paragraph 2 and the new paragraph 3 to be added, the sentence can be modified as 'Very few international agencies or inter-governmental bodies or country have provided any guidance on the use of RMs beyond the expiry date recommended by RMPs'. 7. Existing paragraph 13, line 2: Suggest to replace 'expiry' with 'the expiry date recommended by RMPs'. 8. Existing paragraph 13, line 4: Suggest to add 'as recommended by RMPs' after 'their expiry date' 9. Existing paragraph 14: it is suggested the beginning part of the 2nd sentence be revised as 'The extension of expiry dates beyond the expiry dates recommended by RMPs with verified purity in the measurement systems will not only ensure continuity of their use in the laboratories but also have economic impact by saving the purchasing cost of fresh RMs and overcome the challenges of the disposal of the expired RMs in the environment'. 10. Existing paragraph 15: Suggest to refine the subpoints as follows: (i). consider the proposal for new work on the development of guidance on monitoring the stability of reference materials and stock solutions of pesticides during prolonged storage (Appendix II) based on the information provided in the discussion paper (Appendix I); (ii). review the outline of the proposed new work (Appendix III) to provide general guidance for the further development of the document in the Electronic Working Group should there be agreement to proceed with the new work; and if so, (iii). establish an EWG to prepare guidance on monitoring the stability of reference materials and stock solutions of pesticides during prolonged storage based on the outline provided in Appendix III for consideration by CCPR55 (2024).	
Indicate your agreement to establish an EWG to prepare guidance on monitoring the stability of reference material purity of pesticides during prolonged storage based on the outline provided in Appendix III for consideration by CCPR55 (2024). Singapore will join the e-WG to contribute to the development of the said CCPR guidance document.	

COMMENT	MEMBER/OBSERVER
Considerar si en el documento de debate del Apéndice I se proporcionan suficientes datos/información que respalden la elaboración de directrices para el seguimiento de la estabilidad de la pureza del material de referencia de los plaguicidas durante el almacenamiento prolongado; en caso negativo, proporcionar observaciones generales sobre puntos adicionales que deberían tenerse en cuenta en el documento de debate, nuevas mejoras de la información actual, etc. que podrían orientar la labor del Grupo de trabajo por medios electrónicos en caso de que el CCPR lo vuelva a establecer. Apéndice I: Comentario general: Párrafos 1 al 14: Se considera que la información incluida en el apéndice I es suficiente para respaldar la necesidad de elaborar una directriz que de orientación a los laboratorios sobre el uso del de los MR después de su caducidad.	**Uruguay**
Estudiar la propuesta relativa al nuevo trabajo del Apéndice II y aportar observaciones generales o específicas para mejorar el documento de proyecto, según proceda. Apéndice II: Comentario general: Puntos 1 al 9: Se considera que El apéndice II especifica en forma clara cuál es el objetivo y campo de aplicación del trabajo propuesto. El documento es adecuado y concreto en los diversos aspectos relacionados con la prioridad del mismo, la pertinencia para los objetivos estratégicos del Codex, entre otros.	
Examinar el esbozo de las directrices propuestas en el Apéndice III y proporcionar observaciones generales sobre el formato/estructura y observaciones específicas sobre las consideraciones en materia de gestión de riesgos que deberían mejorarse o incluirse en el esbozo para orientar el trabajo posterior sobre el documento. Apendice III, comentarios generales: Párrafos 6 al 9: Con respecto al esbozo incluido en el apéndice III, al elaborar la directriz se considera que se deberían evaluar diversos factores económicos como las horas de trabajo, el uso de los equipamiento, los reactivos empleados, la cantidad de MRC a emplear en las sucesivas pruebas para determinar la estabilidad de la pureza de forma que sea factible de ser realizado por los diversos laboratorios a nivel global. Si el costo resulta excesivamente elevado puede resultar un obstáculo para la aplicación de esta directriz por parte de los laboratorios de análisis de residuos.	
The United States would like to offer the following specific comments on the discussion paper in Appendix I: • The Background and References sections state that “most” pesticides are stable in the various studies presented. Pesticides are a diverse group of compounds and each compound will need to be assessed independently. It would be more helpful to know which ones were not stable, in the case where generalizations could be made about chemical structure or class of compounds likely to degrade. Some examples may include Dichlorodiphenyltrichloroethanes (DDTs), carbamates, and organophosphates. In addition, pesticides that may be stable individually may not be stable for long periods of time in the presence of other pesticides. • The “Knowledge gaps and challenges” section is intended to identify potential roadblocks to the implementation of the future guidelines. We suggest that knowledge gaps could include: o a lack of information on behavior/degradation of pesticides when present in a mixture vs. as a single component o a lack of information on the appropriate solvent to be used when maintaining an RM for prolonged storage o a lack of information on expected stability of pesticides based on chemical structure o a lack of information on the impact of freeze-thaw cycles on the stability of reference materials o Reference material producers may not support Certified Reference Materials (CRMs) if they are past their expiration date	**USA**
The United States thanks the chairs of the Electronic Working Group (EWG) for their hard work and considers that the data and information provided are sufficient to begin development of guidance for monitoring the purity and stability of reference material (RM) of multi-class pesticides during prolonged storage. The United States supports proceeding with new work on this topic.	
The general principles outlined in the document are sound. The work of the EWG is crucial to ensuring the validity and robustness of the assessment.	**ICUMSA**

SPECIFIC COMMENTS

APPENDIX II: PROPOSAL FOR NEW WORK (PROJECT DOCUMENT)

COMMENT	MEMBER/OBSERVER
4.2.1 Scope of work and establishment of priorities between the various sections of the work The CCPR recognizes the significance of RMs in the analysis of pesticide residues in food commodities and in the soil and aquatic environment. However, the lack of data on purity of RMs during prolonged storage, and absence of SOPs for their analysis prevent their use beyond the expiry period. Scope of the work shall therefore be prioritized stepwise ~~as (i) developing SOP~~ in order to develop SOPs for monitoring the purity of the ~~RMs and~~RMs: i) recommend a list or category of pesticides (such as the Codex pesticide list or commonly used pesticides) that are monitored for the stability and purity of the reference materials (RMs) during prolonged storage. Study results are available to member countries or public, ~~(ii) determining their~~ ii) identify the appropriate methods and techniques that are used to monitor the stability and purity ~~at different time intervals within~~ of the ~~expiry period~~RMs, iii) create a set of procedures along with storage conditions that are used for determining the stability and ~~beyond~~ purity of the ~~expiry period~~RMs, ~~(iii) ascertaining~~ iv) establish criteria that are used to determine whether the purity of the RMs is acceptable for ~~its~~ their use ~~beyond the expiry~~even after their expiry date, ~~and (iv) developing~~ v) develop guidelines for ~~use of~~ laboratories when using RMs ~~beyond their expiry date by laboratories~~that have expired during prolonged storage. Canada recommends revising the wording in “Scope of work and establishment of priorities between the various sections of the work”, to better elaborate the SOPs.	**Canada**
Chile no tiene observaciones respecto a esta sección.	**Chile**
2) Relevance and timeliness of the work At present no guidelines on extending the validity of RMs beyond the expiry period are provided by regulatory agencies of different countries. The advice from CCMAS may also be necessary. Regarding para 8 in appendix 2, add the following text at the end of this para. “The advice from CCMAS may also be necessary.” (Reason) See comments on para 12bis	**Japan**
Review the proposal for new work in Appendix II and provide general/specific comments to improve the project document as appropriate; Review the proposal for new work in Appendix II and provide general/specific comments to improve the project document as appropriate; Singapore’s Comments on Appendix II 1. We propose to refine the title of Appendix II as PROPOSAL FOR NEW WORK ON THE DEVELOPMENT OF GUIDANCE FOR MONITORING THE STABILITY OF REFERENCE MATERIALS AND STOCK SOLUTIONS OF PESTICIDES DURING PROLONGED STORAGE. 2. Section 1) Purpose and scope of new work, paragraph 1: Suggest to modify the second sentence as ‘Analyses of multi-class pesticides in the food chain with reliable measurement and accuracy require RMs of known chemical purity as well as reliable stock solutions and working solutions to produce accurate pesticide residues analytical results to check MRL compliance to ensure safe food and environment’. 3. Section 1) Purpose and scope of new work, paragraph 2: Suggest to refine the second sentence as ‘However, limited shelf life and short expiry date typically recommended by Reference Material Producers (RMPs), hence high recurring cost of RMs act as major impediments for pesticide residue analysis’. 4. Section 1) Purpose and scope of new work, paragraph 3: Suggest to add ‘by the RMPs’ after ‘recommended’.	**Singapore**

COMMENT		MEMBER/OBSERVER
5.	Section 1) Purpose and scope of new work, paragraph 4: Suggest to add 'RMPs' recommended' after 'close to their', for the second last sentence to read as 'Many RMs stay stable even after the date of expiry recommended by the RMPs as mentioned in the CoA and continue to retain their valid purity as per CoA', and for the last sentence to read as 'RMs are therefore entitled for continuous use in the laboratories even after RMPs' indicated expiry dates as valid RMs as long as proper laboratory checks are in place to demonstrate that they continue meeting the purity requirements'.	
6.	Section 1) Purpose and scope of new work, paragraph 5: Suggest to modify the first sentence as 'The proposed guidelines on monitoring the stability of RMs and the related stock solutions will provide guidance to the pesticide residues analysis laboratories for extended use of RMs with acceptable purity beyond their expiry dates as well as for maintaining the concentration accuracy of pesticide stock solutions and working solutions used as calibration standard mixtures to ensure the reliability of pesticide residues test results'.	
7.	Section 2) Relevance and timeliness of the work, paragraph 2, suggest to add 'as recommended by the RMPs' after 'expiry period'	
8.	Section 2) Relevance and timeliness of the work, paragraph 3: suggest to modify the sentence as 'At present very few guidelines on extending the validity of RMs beyond the expiry period are provided by regulatory agencies of different countries.' In view of the new para 2 and 3 to be added under Appendix I.	
9.	Section 2) Relevance and timeliness of the work, paragraph 4: suggest to modify the sentence as 'The proposed work on guidance for monitoring the stability of RM purity of multi-class pesticides before and after RMPs' indicated expiry dates for extended use of RMs and for monitoring the stability of concentration of related stock solutions and work solutions is thus relevant and timely for consideration by the Codex Committee on Pesticide Residues (CCPR)'.	
10.	Section 3) Main aspects to be covered, suggest to refine the sentence as 'The central objective is to extend the use of RMs beyond RMPs' indicated expiry dates for pesticide residue analysis in food and environment samples. The main aspect to be covered is to develop comprehensive harmonized guidelines which enable the laboratories to: 1). monitor the stability of RM purity of pesticides during prolonged storage (before and after RMPs' indicated expiry dates). If the purity of the RMs is found acceptable, their use as RMs after expiry may be continued to be allowed. 2). monitor the stability of stock solutions and working solutions used for multiple pesticide residues analysis to ensure the concentrations of individual pesticides remain accurate within the expiry dates specified by pesticide residues laboratories to ensure their continuing validity as calibration standard mixtures to ensure levels of pesticide residues detected are accurate and reliable'.	
11.	Section 4.1 General criterion: Suggest to add 'The proposed new work is also to monitor the stability of stock solutions and working solutions used for multiple pesticide residue analysis to ensure that the concentrations of individual pesticides continue to be accurate within the indicated expiry date, so that the solutions continue to be valid for the accurate and reliable determination of pesticide residue levels.'	
12.	Section 4.2.1 Scope of work and establishment of priorities between the various sections of the work: For the second sentence, suggest to add 'as recommended by RMPs' after 'expiry period', and for (iii), to add 'date recommended by the RMP' after 'expiry', for (iv), to amend to read as 'developing guidelines for use of RMs by laboratories beyond their RMPs' indicated expiry date' and suggest to add subpoint v): developing guidelines for monitoring the stability of stock solutions and working solutions used for multiple pesticide residues analysis to ensure the concentration accuracy of the individual pesticides remain valid within the expiry dates specified by pesticide residues laboratories.	
13.	Section 4.2.3 Consideration of the global magnitude of the problem or issue: For line 2, suggest to add 'date as indicated by the RMPs' after 'expiry', and for line 5, suggest to amend to read as 'No impediment to international trade is foreseen by having an international agreed guidance on the use of RMs passing the RMPs' indicated expiry date in pesticide residue analysis in exportable food commodities, as long as they have been verified.	

COMMENT	MEMBER/OBSERVER
14. Section 5 The relevance to the Codex Strategic Objectives: For line 5, suggest to add 'and the monitoring of stability of stock solutions and working solutions used for multiple pesticide residue analysis' after 'during prolonged storage'. 15. Section 6 Information on the relation between the proposal and other existing Codex documents as well as other ongoing work: Suggest to add 'and the monitoring of stability of stock solutions and working solutions used for multiple pesticide residue analysis' after 'during prolonged storage'.	
General comment: The United States would like to offer the following comments on the Proposal for New Work/Project Document in Appendix II: • Section 1 (Purpose and scope of new work) addresses the "purity" of an RM but not its concentration. We understand "purity" to refer to the quantifiable presence of other compounds in a reference standard. "Concentration" is an independent characteristic which could change over time, in prolonged storage, and affect the quality of analytical measurements. Purity may be more important for a solid RM, but once in solution both purity and concentration criteria will be important and should be included in future guidelines. • The United States supports the scope of work outlined in Section 4.2.1 and believes that the sections i-iv as written will provide a good foundation to the proposed guidelines. • To understand if the proposed guidelines are likely to be completed by 2024 , the United States suggests that the EWG provide a more clear description of the milestones needed to complete the work.	**USA**

APPENDIX III: GUIDELINES (OUTLINE)

COMMENT	MEMBER/OBSERVER
General comment: If new work is approved, details need to be added to the proposed guidelines based on the scope of work prioritized in APPENDIX II.	**Canada**
Considerando que es relevante que el Codex avance en la elaboración de Directrices para el seguimiento de la estabilidad de la pureza del material de referencia de los plaguicidas durante el almacenamiento prolongado, Chile apoya la elaboración de esta directriz y en el establecimiento de un grupo de trabajo electrónico para realizar esta actividad.	**Chile**
As already stated earlier, Singapore is of the view that the scope of the proposed new work by the e-WG should cover monitoring of not only the stability of pesticide RMs, but also the stock solutions and working solutions made from the pesticide RMs. In this regard, it would be beneficial to pesticide residues laboratories if the draft guidance document can add sections pertaining to storage conditions for stock solutions and working solutions as well as harmonised analytical protocol for the regular monitoring of stability of stock solutions and working solutions for purpose of setting validity period/expiry dates of pesticide stock solutions and working solutions.	**Singapore**
The United States would like to offer the following specific comments on the Proposed draft guidelines in Appendix III: • The proposed draft guidelines should be redrafted to follow the format of other Codex—Introduction and Purpose, Scope, Definitions, etc.	**USA**
OBJECTIVE	
Paragraph 1. La finalidad de estas Directrices es proporcionar un marco ~~que podría ayudar~~ de ayuda a los laboratorios a controlar la estabilidad de la pureza del material de referencia (MR) de los plaguicidas durante el almacenamiento prolongado e identificar el MR caducado con pureza persistente. Permitirá a los laboratorios que participan en el análisis de residuos de plaguicidas en los productos alimenticios y en las muestras ambientales superar las deficiencias asociadas con el MR y utilizarlo después de su fecha de caducidad mencionada en el certificado de análisis (CdA). Chile observa que podría hacerse una mejora en el lenguaje al inicio del objetivo, dado que se genera ambigüedad al desarrollo de la directriz	**Chile**
Paragraph 2. This guidance document is only applicable to pesticides with pure solid/liquid RMs of pesticides with purity specified in the CoA issued by a reference material producer (RMP) conforming to ISO 17034. It covers the storage conditions that should be maintained, and quantitative measurements that should be performed to monitor the purity of RMs before and beyond their expiration period. Rationale: This guidance document is only applicable to pesticides with pure solid/liquid RMs. Consequently, the stock solution's stability should be noted as another consideration.	**Indonesia**
Paragraph 4. If a laboratory maintains the RMs at storage conditions at or better than those recommended ~~by the RMPs~~ in a Certificate of Analysis (COA) (i.e., temperature lower than recommended without exposure to light and moisture), the rate of degradation of the RMs is significantly minimized. Under such conditions, the expiry date as recommended by the RMPs may be extended as appropriate for a RM by a date allowing for storage up to 10 years or as long as the certified property values mentioned in the certificate of analysis (CoA) hold good (≤ ±10%) (SANTE[1], 2022). Another study revealed the stability of pesticide reference standard up to 15 years, and in stock solution up to 10 years (de Kok et al. PO006pdf, 2019). The United States suggests that the sentence be rephrased to read “maintained at or better than recommended in a Certificate of Authenticity (COA),” as it may be difficult to store something at ‘better than’ a condition like -80 C, and given that the purity/level/concentration must be experimentally validated.	**USA**

COMMENT	MEMBER/OBSERVER
Also, the discussion paper has sufficiently presented the evidence for a storage expectancy of 10-15 years; it is not needed to include that information again in paragraph 4. In addition, since this timeframe will be specific for each pesticide being considered, as determined empirically by laboratory analysts, it is somewhat irrelevant.	
Paragraph 5. To avoid the degradation of RMs, the vials must be placed in airtight capped tube/sealed pouch and immediately stored in the refrigerator at ≤-25°C (Sharma et al. 2020). It is stated that the vials must be placed in an airtight capped tube/sealed pouch and immediately stored in the refrigerator at ≤ –25°C. We propose storage conditions kept in the refrigerator at a temperature of -18°C based on other references, i.e., de Kok et al. (2019) or at -20°C based on Dorweiler (2016) and Avramides (2005).	**Indonesia**
Paragraph 5. To avoid the degradation of RMs, the vials must be placed in airtight capped tube/sealed pouch and immediately stored in the ~~refrigerator~~ freezer at ≤-25°C (Sharma et al. 2020).	**USA**
ANALYTICAL PROTOCOL FOR DETERMINING THE PURITY OF REFERENCE MATERIALS	
General comment: The United States would like clarity on the guidance in paragraphs 6-9. Is the guidance suggesting that the analysts prepare a solution and aliquot upon receipt and assess purity when those aliquots are used? Or to weigh solid material for solution preparation every time the RM is needed? It is not recommended to subject solutions to repeated freeze-thaw cycles without understanding stability implications. In addition, re-opening a CRM multiple times during prolonged storage, either solid or liquid, will introduce light and atmosphere that may affect the stability. In addition, the United States suggests that separate paragraphs be written to address how to assess RMs that are single analyte solutions vs. mixtures. The analytical protocol should include determination of the identity of any impurities that may impact other components in a multi-analyte mixture. For example, dimethoate degrades to omethoate. The United States suggests that the analytical protocol more clearly explain how the presence of impurities and the concentration of the RM analyte will both be determined.	**USA**
Paragraph 6. In para. 6, the United States notes that while all of the methods listed are acceptable, they have inherently different levels of uncertainty and precision. Future guidelines should address comparison of results for users of CRMs that may not have access to the level of characterization as the reference material providers.	**USA**
Párrafo 6. Chile sugiere especificar cómo se realizará el proceso de verificación de la pureza utilizando el porcentaje del área del pico cromatográfico, es decir, si se comparará la respuesta instrumental obtenida en el laboratorio que desea verificar la pureza, con la mostrada en el certificado de análisis, o con una medición en el laboratorio de cuando el MR estaba vigente con la respuesta obtenida posteriormente, cuando el MR esté fuera de la fecha de vigencia. Si corresponden ambas o inclusive si existiera otra comparación posible.	**Chile**
Párrafo 7. Se solicita establecer el periodo máximo de tiempo en que esta actividad se debe realizar (verificación de la pureza).	
Paragraph 8. We would like to clarify the deviation for stability evaluation within 5% in Para 8. Based on the reference of de Kok (2019), we believe that the variation of stability evaluation is still acceptable at 10%.	**Indonesia**
Paragraph 8. In para. 8, the United States suggests that the purity tolerance may be dependent on which type of instrumentation is used (and its inherent uncertainty) for a particular pesticide and that +/- 5% may not be suitable or applicable in all cases.	**USA**

COMMENT	MEMBER/OBSERVER
Párrafo 8. Chile considera que no se condice con la cita en el párrafo 4, donde indica que: “En tales condiciones, la fecha de caducidad recomendada por los PMR puede prolongarse según corresponda para un MR hasta una fecha que permita el almacenamiento hasta 10 años o mientras los valores certificados de las propiedades mencionados en el certificado de análisis (CdA) se mantengan bien (≤ ±10%) (SANTE, 2022)”.	**Chile**
Paragraph 9. We propose that the gravimetric records that should be kept for RMs during storage require further clarification. The minimum requirements for analytical equilibrium should be stated specifically. Before weighing the vial, should it be at ambient temperature?	**Indonesia**
Párrafo 9. En cuanto a los registros gravimétricos, se solicita especificar para qué tipo de material de referencia son adecuados.	**Chile**
ANNEX	
Certified Reference Material (CRM) (CRM) Is Reference material (RM) characterized by a metrologically valid procedure for one or more specified properties, accompanied by an RM certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability reference: ISO Guide No. 30/2015	**Egypt**
Stability The term “stability” and its definition are not aligned. The United States suggests that the term be renamed “stability testing” or that the definition be revised to “The tendency of a material to resist change or decomposition in its environment.”	**USA**