CODEX ALIMENTARIUS COMMISSION

Food and Agriculture Organization of the United Nations

World Health Organization

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Agenda Item 6

CX/CF 23/16/6-Add.1
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ORIGINAL LANGUAGE ONLY

JOINT FAO/WHO FOOD STANDARDS PROGRAMME

CODEX COMMITTEE ON CONTAMINANTS IN FOODS

16th Session
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26 April 2023 (virtual report adoption)

CODE OF PRACTICE FOR PREVENTION AND REDUCTION OF MYCOTOXIN CONTAMINATION IN CASSAVA AND CASSAVA-BASED PRODUCTS (AT STEP 7)

Comments at Step 6 in reply to CL 2023/19-CF

submitted by

Argentina, Canada, Chile, Cuba, Egypt, Iraq, Kenya, New Zealand, Peru, Republic of Korea, United States of America (USA), International Commission for Uniform Methods of Sugar Analysis (ICUMSA) and Public Research and Regulation Initiative (PRRI)

Background

1. This document compiles comments received through the Codex Online Commenting System (OCS) in response to CL 2023/19-CF[1] issued in February 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 Annex

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=CCCF

Annex

GENERAL COMMENTS

COMMENT	MEMBER/ OBSERVER
Los ítems 4.2 Herramientas de transporte y 4.3 Condiciones de conservación, deberían estar incluidos en la sección 5. PRÁCTICAS RECOMENDADAS APLICABLES A ETAPAS POSCOSECHA.	**Argentina**
Canada supports the development of a CoP for the prevention and reduction of mycotoxin contamination in cassava and cassava-based products and participated in the eWG concerning this item. The format and organization of the CoP is consistent and logical. It covers a wide range of topics and appears reasonably comprehensive. Canada supports the CoP advancing to Step 8 for final adoption by CAC	**Canada**
Cuba considera que es un documento muy importante y completo, se manifiesta de acuerdo con el mismo y no presenta comentarios adicionales.	**Cuba**
Egypt appreciates the work and efforts done in the document and supports the code of practice.	**Egypt**
Agree with regards-	**Iraq**
Kenya appreciates the work done by the EWG chaired by Nigeria and co-chaired by Ghana and supports the advancement of the CoP to step 8 by CAC46.	**Kenya**
New Zealand acknowledges the work of the Chair, co-chair and EWG members for their extensive work on the Code of Practice for the prevention and reduction of mycotoxin contamination in cassava and cassava-based products. New Zealand supports the advancement to Step 8 of the Code of Practice for the prevention and reduction of mycotoxin contamination in cassava and cassava-based products as set out in Appendix I by CCCF16, and subsequent advancement for final adoption by CAC46 (2023).	**New Zealand**
El Perú desea agradecer a la Secretaría de la Comisión del Codex Alimentarius, Programa Conjunto FAO/OMS sobre Normas Alimentarias, respecto a la Solicitud de observaciones sobre el Código de prácticas para prevenir y reducir la contaminación por micotoxinas en la yuca (mandioca) y los productos a base de yuca (mandioca). En esta ocasión, el Perú agradece a Nigeria y Ghana por el excelente trabajo, sin embargo, nos gustaría que en el CDP se puede identificar de las practicas recomendadas a corto, mediano y largo plazo a fin de que estás se puedan aplicar de manera adecuada por los productores.	**Peru**
• The United States thanks Nigeria for their work on this agenda item. • The United States supports final adoption by CAC46 (2023). • The United States will provide minor comments to be addressed before adoption.	**USA**
The use of numbers for the paragraphs (e.g. 1, 2..7 are all below the heading "1. INTRODUCTION") is confusing, especially in conjunction with numbered headings and sub-headings. If this numbering is required, there isn't a need for the indent in the second line of the numbered paragraphs.	**ICUMSA**

SPECIFIC COMMENTS

COMMENT	MEMBER/ OBSERVER
Para 3. Storage duration may play a role in mycotoxin production, as it is ~~know~~ known that the risk of postharvest fungal infection and production of mycotoxins in stored grain increases with the storage duration as indicated in the *Code of practice for the prevention and reduction of mycotoxin contamination in cereals* (CXC 51-2003).	**Canada**
Para 7. This Code of Practice provides science-based information for all countries to contemplate in their efforts to prevent and reduce mycotoxin contamination in cassava and ~~cassava-based~~ cassava-based products.	
Para 8. This Code of Practice provides information on general principles for the reduction of various mycotoxins in cassava and ~~cassava-based~~ cassava-based products. In addition, it provides a basis for training and education of farmers, agricultural workers, processors, manufacturers, and distributors.	
Para 9. The farmer should avoid planting in valleys, to avoid pooling water and flooding. Water can transport fungal innoculums. Where possible, ensure proper planning for crop rotation in successive seasons. This will help in reducing innoculums in the farm which may be present from post-harvest waste that harbour toxigenic fungal spores. Particular crops (e.g. groundnuts, maize and sugarcane) have been found to be susceptible to certain species of toxigenic fungi and rotating planting with these crops should be monitored and evaluated. Crops that are said to be of low susceptibility to toxigenic fungi should be used in rotation to reduce the cross contamination from ~~the~~inoculum~~innoculums~~.	
Para 13. Avoid planting cassava on land where groundnut, maize, sugarcane or other highly susceptible crops were cultivated the previous year because such soils are likely contaminated with *Aspergillus flavus, Aspergillus* ~~*parasitic us*~~*parasitic-us* and related species.	
Para 18. Harvesting should involve adequate planning in order to maintain quality, and prevent crop wastage ~~andpossible~~ and possible rot. The amount of roots to be harvested should be determined based on market needs and demand.	
Para 22. Prior to the processing step and while being held for use, cassava roots should not be exposed to the sun, high temperatures, mechanical damage, or other conditions that could promote fungal contamination, since the roots still have a high water activity suitable for microbial development. Water activity (a_w), commonly defined in foods as the water that is not bound to food molecules that can support the growth of bacteria, yeasts, and fungi. A continuous progression from harvest to final product should be planned, in order that the roots will not be stored for a long period. The ideal time is 2 to 3 days without enhanced storage methods.	
Para 22. Prior to the processing step and while being held for use, cassava roots should not be exposed to the sun, high temperatures, mechanical damage, or other conditions that could promote fungal contamination, since the roots still have a high water activity suitable for microbial development. Water activity (a_w~~),~~) is commonly defined in foods as the water that is not bound to food molecules that can support the growth of bacteria, yeasts, and fungi. A continuous progression from harvest to final product should be planned, in order that the roots will not be stored for a long period. The ideal time is 2 to 3 days without enhanced storage methods	
Para 32. The fermentation of cassava roots is primarily used for further cyanide elimination, flavor development and product stability. The sack and the container in which the grated pulp and the peeled root will be kept for fermentation process, should remain clean at all times and especially before use, to ensure it does not become a natural source of innoculums. Fermentation typically takes ~~place,~~ place over 2 to 5 ~~days fermentation~~days.	

COMMENT	MEMBER/ OBSERVER
Para 36. The environment should be monitored to prevent cross contamination from dust. The dried flour should be stored in a clean moisture-proof container. The milling machine should be ~~cleaned and~~ cleaned, washed and dried after use.	
Para 22. Chile agradece la oportunidad de presentar observaciones al Código de prácticas para prevenir y reducir la contaminación por micotoxinas en la yuca (mandioca) y los productos a base de yuca (mandioca). Chile revisó las recomendaciones de esta carta circular y sus comentarios se exponen a continuación: - En el párrafo 22 del Código de Prácticas revisado, se indica "Water activity (aw), commonly defined in foods as the water that is not bound to food molecules that can support the growth of bacteria, yeasts, and fungi." Y una redacción más correcta seria "Water activity (aw), is commonly defined in foods as the water that is not bound to food molecules that can support the growth of bacteria, yeasts, and fungi." A modo general, Chile quisiera apoyar el avance de este Código de Prácticas para adopción final en trámite 8 por la CAC46.	**Chile**
Para 3. There are 2 words, 'innoculums and innocula', are used in this COP. The plural of innoculums is innocula, so it is recommended to use the word 'innocula'	**Republic of Korea**
Para 1. Mycotoxins are fungal toxins that have been reported in a wide variety of agricultural products. They can pose health and economic consequences. The most frequently occurring mycotoxins in cassava and cassava-based products are aflatoxins and ochratoxin A. The aflatoxins are mainly produced by *Aspergillus flavus*, *A. ~~parasitic us~~parasiticus*, *A. nomius and A. minisclerotigenes*; while Ochratoxin A is mainly produced by *Penicillium verrucosum and Aspergillus ochraceus* as well as *A. carbonarius* and *A. niger*. ~~The aflatoxins~~ Aflatoxins are among the most potent carcinogenic, teratogenic, and mutagenic compounds known. Depending on the host species, these mycotoxins can act as nephrotoxins, hepatotoxins, immunotoxins, neurotoxins, teratogens, or carcinogens, however, the liver is the primary target for toxicity. The major aflatoxins commonly found in agricultural commodities are aflatoxin B1, B2, G1, and G2, of which aflatoxin B1 is the most potent. Ochratoxin A may cause nephrotoxic, teratogenic, immunosuppressive and carcinogenic effects, depending on the species. It also causes porcine nephropathy and has been implicated in the etiology of Balkan endemic nephropathy (BEN) in humans. Ochratoxin A is one of the most potent renal carcinogens, inducing cancer in rats at very low doses. The International Agency for Research on Cancer (IARC) has classified the aflatoxins as carcinogenic to humans (Group 1) and Ochratoxin A as *possibly* carcinogenic to humans (Group 2B).	**PRRI**
Para 7. This Code of Practice provides science-based information for all countries to contemplate in their efforts to prevent and reduce mycotoxin contamination in cassava and ~~cassava-based~~ cassava-based products.	
Para 8. This Code of Practice provides information on general principles for the reduction of various mycotoxins in cassava and ~~cassava-based~~ cassava-based products. In addition, it provides a basis for training and education of farmers, agricultural workers, processors, manufacturers, and distributors.	
Para 9. The farmer should avoid planting in valleys, to avoid pooling water and flooding. Water can transport fungal innoculums. Where possible, ensure proper planning for crop rotation in successive seasons. This will help in reducing innoculums in the farm which may be present from post-harvest waste that ~~harbour~~ harbours toxigenic fungal spores. Particular crops (e.g. groundnuts, maize and sugarcane) have been found to be susceptible to certain species of toxigenic fungi and rotating planting with these crops should be monitored and evaluated. Crops that are said to be of low susceptibility to toxigenic fungi should be used in rotation to reduce the cross contamination from ~~the~~the innoculums.	

COMMENT	MEMBER/ OBSERVER
Para 11. Selection and use of healthy, ~~pest~~ pest- and ~~disease free~~ disease-free cassava stems are important for good planting. The ability to resist fungi and other plant pathogens should be considered when selecting cassava varieties. Cassava cuttings that are free of fungi should be planted.	
Para 12. To prevent fungal growth no ~~dead~~ infected (having rooting spots) stem should be planted. Planting practices that have been reported to prevent rot could be adopted including *vertical planting* which involves placing the cassava cuttings vertically to avoid rot, especially during the rainy season.	
Para 13. Avoid planting cassava on land where groundnut, maize, sugarcane or other highly susceptible crops were cultivated the previous year because such soils are likely contaminated with *Aspergillus flavus, Aspergillus* ~~*parasitic us*~~*parasiticus* and related species.	
Para 15. The use of post emergence herbicide could be recommended immediately once weeds are spotted on the field. In some cases, pre-emergence herbicides could be used before planting to minimize weed growth. Small-scale farms could use hoes and cutlasses to remove weeds, however, care should be taken to prevent mechanical injury of the ~~plant~~cassava plants. Note that land preparation needs to be done properly to control the weeds, at least for the first 3 months.	
Para 17. Where irrigation is used, ensure that it is applied evenly and that all plants in the field have an adequate supply of water. Irrigation is a valuable method of reducing plant stress in some growing situations. Excess precipitation during anthesis (flowering) makes conditions favourable for dissemination and infection by *Fusarium spp*.; thus sprinkle irrigation during anthesis and the maturation of the roots should be avoided.	
Para 18. Harvesting should involve adequate planning in order to maintain quality, and prevent crop wastage ~~andpossible~~ and possible rot. The amount of roots to be harvested should be determined based on market needs and demand.	
Para 22. Prior to the processing step and while being held for use, cassava roots should not be exposed to the sun, high temperatures, mechanical damage, or other conditions that could promote fungal contamination, since the roots still have a high water activity suitable for microbial development. Water activity (a_w~~),~~) is commonly defined in foods as the water that is not bound to food molecules and that can support the growth of bacteria, yeasts, and fungi. A continuous progression from harvest to final product should be planned, ~~in order~~ so that the roots will not be stored for a long period. The ideal time is 2 to 3 days without enhanced storage methods	
Para 24. Cassava roots can be processed into various fermented or ~~unfermented~~ non-fermented cassava-based products. These products, which may be specific to certain regions, have a wide range of applications including food for humans. The processing steps by which these various products are obtained ~~differs~~ differ and can be found in the *Code of practice for the reduction of HCN in cassava and cassava products* (CXC 73-2013). The approach here is to mention some of the various steps that may potentially influence fungal contamination but not for any specific product ~~type. For~~ type (for some product types see Figure ~~1~~1). Processing of cassava should be initiated within within 8-12 hours of receiving cassava roots as a raw material to avoid spoilage.	
Para 25. After harvest if cassava root is to be processed immediately it should be washed to remove the surface dirt and soil ~~acquired~~ thus reducing innoculums of toxigenic fungal species. The source of water is an important factor to be considered, also. Either potable water or water treated ~~such~~ in a way that ~~it~~ makes is fit for its intended purpose should be used for washing to avoid potential contamination. Proper washing is vital to ensure sand or mud is removed from all parts of the root, especially the contours.	
Para 27. For the processing of roots of sweet cassava varieties, it is recommended to boil the roots immediately after peeling and washing. This will expose any fungus to temperatures they cannot survive. If not used~~,~~ immediately, adequate care should be taken to prevent fungal re-contamination.	

COMMENT	MEMBER/ OBSERVER
Para 3. There are 2 words, 'innoculums and innocula', are used in this COP. The plural of innoculums is innocula, so it is recommended to use the word 'innocula'	**Republic of Korea**