

# CODEX ALIMENTARIUS COMMISSION



Food and Agriculture  
Organization of the  
United Nations



World Health  
Organization

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Agenda Item 10

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ORIGINAL LANGUAGE ONLY

## JOINT FAO/WHO FOOD STANDARDS PROGRAMME CODEX COMMITTEE ON CONTAMINANTS IN FOODS

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### PROPOSED DRAFT CODE OF PRACTICE FOR THE PREVENTION AND REDUCTION OF MYCOTOXIN CONTAMINATION IN SPICES (AT STEP 4)

*Comments submitted at Step 3 (in response to CL 2017/28-CF) by Canada, Chile, Costa Rica, Cuba, Ecuador, EU, Japan, Kenya, New Zealand, Peru, Republic of Korea, USA and AU*

#### CANADA

Canada wishes to express its appreciation to Spain, India and the Netherlands for their leadership of the electronic Working Group (eWG) tasked to coordinate proposed revisions to the Draft Code of Practice (CoP) **for the Prevention and Reduction of Mycotoxin Contamination in Spices**. Canada would like to offer the following suggestions for the consideration of the Committee.

Comments and suggestions for CL 2017/28-CF, Appendix I:

Para. 8. "Spices may include the aril (e.g. the mace of nutmeg), bark (e.g. cinnamon), berries (e.g. black pepper), buds (e.g. clove), bulbs (e.g. garlic), ~~(e.g. saffron)~~ rhizomes (e.g. ginger, turmeric), seeds (e.g. mustard), flowers or stigmas (e.g. saffron), pods (e.g. vanilla), resins (e.g. asafoetida), fruits (e.g. chilli) and plant tops."

Para. 14. "Insect damage which enhances ~~to~~ fungal infection in the vicinity of the crop can be minimized by proper use of registered insecticides and other appropriate practices within an integrated pest management program."

Para. 15. "**When conditions require, R**recommended insecticides may be necessary to ~~use, when conditions require,~~ minimize damage to fruits, which may later favour entry and development of toxigenic fungi; for example, through open galleries made by caterpillars."

Para. 16. "Weeds around the crop should be controlled by use of mechanical methods or by use of registered herbicides or other safe and suitable weed eradication practices. **Avoiding the use of livestock manure as fertilizer can help control the proliferation of both weeds and mycotoxigenic fungi.** It may also be useful to establish an appropriate planting density ~~and prevent to further discourage~~ weed proliferation during plant development."

Para. 17. "The use of recommended soil fungicides in the process of farm soil preparation may be beneficial to reduce the inoculum load of toxigenic fungi. **The presence of debris in bare seed may also provide a vector for fungal infection.** At sowing, use disinfected seeds to prevent mould and insects and carefully choose the planting season so that the collection of fruits takes place in the driest season. This good practice is essential in areas with a warm and humid climate." *The large majority of instances of the word 'mould' in the document are spelled with the letter 'u' (e.g. paragraphs 12, 25-27, 32, 34...) rather than 'mold' as it is spelled in this and other (e.g.41) paragraphs.*

Para. 19. "It is recommended that untreated organic waste ~~should~~ not be applied to soil surrounding the crop in the field, as it could allow the proliferation of toxigenic fungi, human pathogens, food spoilage bacteria, and also weed seeds and other unwanted plants. **This is particularly important for spices that are swathed rather than straight cut, as rain splash is more likely to contaminate swathed spices. If untreated organic waste is used, it is recommended that it be applied far from harvest time, particularly for swathed crops. Therefore,** ~~the~~ use of properly treated organic waste (compost) is encouraged in order to improve soil fertility and increase competitive fungi."

Para. 22. "It is recommended ~~that to remove~~ diseased and injured plants or parts ~~thereof of the plants be removed~~ from the field in order to reduce ~~the~~ inoculum load of ~~the relevant~~ toxigenic fungi."

Para. 26. "The soil under the plant should be covered with a clean sheet of plastic during ~~picking harvest to avoid prevent~~ commodities from getting contaminated by dirt or mixed up with mouldy parts of the plant that have fallen prior to harvesting."

Para. 28. "Drying of crops should begin immediately after harvest and farmers should not hold the crop in piles or in bags for any period of time. ~~and w~~When necessary, plastic sheets should be used to cover the crop in the event of rain during the drying process."

Para. 31. *The spellings in this paragraph ("minimise") and paragraph 73 ("minimises") do not match the spelling used in paragraphs 3, 12, 14, 34, 44, 56 and 59 ("minimize").*

Para. 43. "Drying should be done on a concrete surface, preferably a raised platform. Whenever possible, avoid drying on plastic sheets or tarpaulins as the moisture remains in contact with the source plants during the drying process. In case those plastic sheets or tarpaulins are used, extra care should be taken for homogeneous drying by shifting the spices ~~on-at~~ regular intervals."

Para. 48. 1. e. "In the case of spices coming from fruits, for instance, the layer of drying fruits should not be more than 4 cm thick, the drying fruits must be regularly raked (5-10 times per day) and fruits should be protected during drying from rain, ~~and~~ night dew ~~and any other sources of moisture~~. Fruits ~~that have been dried~~ should not be allowed to get ~~re-wet again~~ during storage or ~~at~~ any other time."

Para. 54. "~~Specific conditions to be utilized include the use of~~ ~~It is recommended that~~ local ventilation systems ~~that force the production of~~ ~~be employed to produce~~ currents of cold, dry air to assure good ventilation, ~~s~~Storage in a clean, dry place, and protection from dust, debris, insects and rodents ~~are also recommended~~. Product should be stored in well maintained warehouses that do not allow the ingress of water ~~whether~~ through ~~leaks in the roof or walls, or under doors, through open windows, etc. open windows, gaps beneath doors, or leaks in the storage enclosure.~~"

Para. 55. "Spices should not be stored with other food commodities (such as fruits, vegetables, fish) ~~and or~~ non-food products (such as kerosene, lubricating oils) that may affect the moisture content (~~e.g., increase in moisture for leading to the~~ growth of mycotoxin-producing fungi), ~~as well as or alter the~~ flavour or colour of the spice."

Para. 56. *This paragraph appears redundant; contact with water is already mentioned in paragraphs 48, 54 and 57.*

Para. 60. "The effectiveness of ~~the use-~~chemical compounds ~~used~~ to prevent fungal growth and mycotoxin production has to be demonstrated. ~~If allowed,~~ ~~t~~Treatments with approved chemicals including sodium bisulfite, ozone, or acids and bases represent an opportunity to control fungal growth and mycotoxin biosynthesis in stored spices. The use of bases ~~like such as~~ ammonia ~~that~~ can affect the aroma of spices. ~~Hence it should not be~~ ~~is not~~ recommended."

Sub-heading before Para. 63: "2.3.4.1 Preventing moisture ~~content~~ **accumulation**"

Para. 69. "Bags should preferably be placed on a layer of pallets to avoid contact with the floor where condensation from the ceiling and walls may gather. If available, fully ventilated containers are preferable for spices in bags, especially if shipped from a high humidity ~~origin region~~."

Para. 73. "~~It is important to maintain~~ ~~A ample~~ ~~top~~ space between bags and the roof ~~of the truck is important to be maintained~~. Use ~~of~~ the saddle stow method, which ~~minimizes~~ side contact and ~~maximizes~~ airflow between the bags, ~~is recommended~~."

Para. 74. " Because dried spices are hygroscopic, they must be packaged quickly after processing using a material that serves as a barrier to moisture. The use of packaging technologies that ~~ensure the maintenance prevent the inflow~~ of moisture, such as vacuum or modified atmosphere, with the use of the appropriate packaging material is an option of use."

## CHILE

Chile agradece la oportunidad de presentar observaciones sobre el anteproyecto de Código de prácticas para prevenir y reducir la contaminación de las especias por micotoxinas.

Chile revisó el resumen proporcionado por el GTe en el apéndice II de esta carta circular y sus comentarios se exponen a continuación:

PARRAFO N°	RECOMENDACIONES	Observaciones
3,1	Proponer al Comité examinar el anteproyecto de código de prácticas para prevenir y reducir las micotoxinas en las especias para adelantarlo en el procedimiento de los trámites.	<i>El documento revisado está muy completo y claro por lo que Chile apoya proponer adelantar este anteproyecto en el procedimiento de trámites.</i>
3,2	Proponer al Comité sobre Higiene de los Alimentos examinar la posibilidad de incluir algunas prácticas generales para las especias sobre higiene (Sección 2.3.4.2) y embalaje (Sección 2.3.5), mencionadas en el párrafo 2 (puntos V y VI) en el Código de prácticas de higiene para alimentos con bajo contenido de humedad, Anexo III sobre especias y hierbas aromáticas desecadas (CAC/RCP 75-2015).	<i>Chile está de acuerdo con proponer al comité de higiene incluir las prácticas indicadas sobre higiene y embalaje en el párrafo 2, en el Código de prácticas de higiene para los alimentos con bajo contenido de humedad.</i>
3,3	Proponer al Comité sobre Etiquetado de los Alimentos apoyar la parte de este CP con respecto al etiquetado y distribución e información a los consumidores (Sección 2.3.6), ya mencionado en el párrafo 2 (punto VII).	<i>Chile considera necesario especificar las condiciones requeridas para mantener el producto con una baja cantidad de humedad por parte del consumidor por lo que apoya lo sugerido.</i>
7,0	No hay bases para elaborar anexos específicos para las disposiciones generales (texto) del CP, ya que no hay información nueva sobre prácticas de gestión específicas para prevenir y reducir la contaminación de las especias por micotoxinas. Por lo tanto, el GTe propone que el Comité deje de trabajar en los anexos en esta etapa, hasta que haya más información sobre prácticas de gestión específicas.	<i>Chile considera que el Código de Prácticas, siendo general, abarca lo necesario para lograr su objetivo, por lo que está de acuerdo con dejar de trabajar en los anexos en esta etapa.</i>

#### COSTA RICA

Costa Rica felicita a la India y Países Bajos por el trabajo realizado y, agradece la oportunidad de emitir comentarios. En ese sentido, desea externar el apoyo a la elaboración del código y, las recomendaciones propuesta por el grupo de trabajo electrónico.

Asimismo; Costa Rica apoya la recomendación del GTe al Comité, respecto a suspender los trabajos correspondientes a los anexos en esta etapa, hasta que haya más información sobre prácticas de gestión específicas.

#### CUBA

En respuesta al documento CL 2017/28-CF petición de observaciones en el trámite 3 sobre el anteproyecto de código de prácticas para prevenir y reducir la contaminación de las especias por micotoxinas Cuba está de acuerdo con el documento.

#### ECUADOR

Ecuador, felicita la laborar de España, India y Países Bajos, respecto a la elaboración del Anteproyecto de Código de Prácticas para prevenir y reducir la contaminación de las especias por micotoxinas, al respecto a Ecuador le gustaría mencionar lo siguiente:

**(i) Comentarios Específicos:**

En la sección correspondiente a "OBJETIVOS", se sugiere que los párrafos 3 y 4 sean redactados en base a un objetivo.

~~3. Este código de prácticas se ocupa de buenas prácticas agrícolas (BPA) específicas, buenas prácticas de fabricación (BPF) y buenas prácticas de almacenamiento (BPAL) que ayudarían a reducir al mínimo la contaminación por micotoxinas en todas las etapas de la producción de las especias, desde la producción primaria hasta el consumo.~~

~~4. Las buenas prácticas agrícolas (BPA), BPF y BPAL se aplican en la etapa precosecha, y durante la elaboración y el almacenamiento, respectivamente.~~

**Reemplazar por:**

2. Establecer un código de prácticas general para prevenir y reducir la presencia de micotoxinas en las especias, a fin de alcanzar el nivel más bajo que pueda lograrse de estas toxinas mediante la aplicación de buenas prácticas agrícolas (BPA) específicas, buenas prácticas de fabricación (BPF) y buenas prácticas de almacenamiento (BPAL) en toda la cadena alimentaria, y reducir de esta manera la exposición de los consumidores a través de medidas preventivas.

**Justificación:**

- Los objetivos del documento deben ser claros y especificar puntualmente para que se desarrolla el documento.

Respecto al Párrafo 4 (en la misma sección), se sugiere que se utilice los términos cosecha y Poscosecha, en vista de que no solamente se habla de prácticas recomendadas sobre la base de las Buenas Prácticas Agrícolas; sino también de "Condiciones agrícolas después de la recolección" (que se referiría a procesos Poscosecha), entre ello se habla de: recolección, transporte, almacenamiento (planta de origen).

**(i) Comentarios Generales:**

Respecto a la petición de observaciones en el Apéndice II, específicamente de los párrafos 3 y 7, Ecuador menciona lo siguiente:

<b><u>Párrafo 3</u></b>	
<b>Recomendación</b>	<b>Decisión</b>
Proponer al Comité sobre Higiene de los Alimentos examinar la posibilidad de incluir algunas prácticas generales para las especias sobre higiene (Sección 2.3.4.2) y embalaje (Sección 2.3.5), mencionadas en el párrafo 2 (puntos V y VI) en el Código de prácticas de higiene para alimentos con bajo contenido de humedad, Anexo III sobre especias y hierbas aromáticas desecadas (CAC/RCP 75-2015).	Apoyar que se realice esta solicitud al Comité sobre Higiene de los Alimentos, especificando netamente que es el tema de especias.
Proponer al Comité sobre Etiquetado de los Alimentos apoyar la parte de este CP con respecto al etiquetado y distribución e información a los consumidores (Sección 2.3.6), ya mencionado en el párrafo 2 (punto VII).	Apoyar que se realice esta solicitud al Comité de Etiquetado de los Alimentos, solicitamos que se haga hincapié en la distribución e información a los consumidores.
<b><u>Párrafo 7</u></b>	
No hay bases para elaborar anexos específicos para las disposiciones generales (texto) del CP, ya que no hay información nueva sobre prácticas de gestión específicas para prevenir y reducir la contaminación de las especias por micotoxinas.  Por lo tanto, el GTe propone que el Comité deje de trabajar en los anexos en esta etapa, hasta que haya más información sobre prácticas de gestión específicas.	Apoya el hecho contar con mayor información para que en un futuro el Comité desarrolle trabajos relacionadas al anexos para este CDP.

Ecuador apoya la continuación de este trabajo.

## EU

The European Union and its Member States (EUMS) welcome and appreciate the work done on the proposed draft Code of Practice for the prevention and reduction of mycotoxin contamination in spices by the electronic working group (eWG) chaired by Spain and co-chaired by India and The Netherlands.

The EUMS wish to make following specific comments to the proposed draft Code of Practice for the Prevention and Reduction of Mycotoxins in Spices:

**§4 and §10:** for reasons of consistency with the use of the acronyms “GMPs” and “GSPs” in §4, to mention only the acronym “GAPs” and delete “good agricultural practices”

**§ 10:** Even if § 10 is related to pre-harvest agricultural conditions, given that the main risk for contamination by aflatoxins and ochratoxin A is during drying and storage it is appropriate to make reference to it in the paragraph and to reword the paragraph 10 as follows: “10. Spices are susceptible to contamination by toxigenic fungi in the field, during drying and storage. The use of appropriate ~~good agricultural practices (GAP)~~ to reduce the toxigenic fungi growth and dissemination is recommended.”

**Heading 2:** This is a main heading, it is therefore appropriate to mention the full wording beside the acronym. However, as points 2.2.4 and 2.3.3 refer explicitly to good storage practices, the heading should also refer to Good Storage Practices (GSPs).

**§ 8:** the definition of spices refers to “dried components” and “dried plants”. It might be appropriate in order to avoid confusion and to ensure completeness to clarify that this include also spices harvested as dried (and that it does not only relate to spices which are dried after harvesting)

It is also appropriate to further clarify the relation of the second part of §8 with the information provided in Appendix II, § 2, point i. with specific reference to the Classification of Food and Feed (CAC/MISC 4-1989) and in particular to the revised group of spices (Type 005 – Group 028) as proposed for adoption by CAC in REP 11/PR, Appendix VI.

- In REP11/PR, Appendix VI, 8 subgroups (028A to 028H) are proposed. However in the second part of §8 no reference is made to the subgroup 028H, Citrus peel.

- On the other hand, the second part of §8 refers to

\* “bulbs” and “plant tops” not mentioned in the group of spices (Type 005 – Group 028). Also the example garlic is not included in the group 028. The example saffron after “bulbs” has to be deleted as it is an example of “stigmas”

\* “pods” which are in the group of spices (Type 005 – Group 028) included into the subgroup 0028B “fruit or berry”

\* “resins” which are in the group of spices (Type 005 – Group 028) referred to by note 2 to Asafoetida grouped under subgroup 028D “root or rhizome”

\* “mustard” as example of seeds while in the group of spices (Type 005 – Group 028) mustard seed is not included in the subgroup 028A “seeds” and is even not included into the group of spices (Group 028).

\* “chilli” as example of “fruits” while in the group of spices (Type 005 – Group 028) chilli (*Capsicum sp.*) is not included in the subgroup 028B “fruit or berry” and is even not included into the group of spices (Group 028).

**§ 12:** In addition to crop rotation (which is not feasible for all spices), it is also appropriate to avoid vicinity of crops which are known to be host plants for *Aspergillus flavus*, such as maize.

**§ 14 and § 15:** as they (partly) overlap it is proposed to combine the two paragraphs into one paragraph.

**§ 18:** Mycotoxin biosynthesis might be increased due to suboptimal application of fungicides due to fungicide stress. Furthermore no fungicide has been adopted for the practical control of *Aspergillus flavus/A. parasiticus* infection. It would be appropriate to add these elements to § 18 which would then read as follows:

“The use of fungicides is a very effective practice to prevent fungal growth. However, no fungicide, or combinations of fungicides, or other chemical treatments appear to have been adopted for the practical control of *Aspergillus flavus/A. parasiticus* infection and subsequent aflatoxin contamination of spices pre-harvest. Furthermore fungicides must be applied with special care since some of them could lead to the reduction of certain non-toxigenic fungal flora and stimulation of other toxigenic fungi growth and suboptimal application of fungicides can have a counteractive effect as mycotoxin biosynthesis might be increased due to fungicide stress”

**§ 24:** it is proposed to reword the paragraph as follows: “Mechanical damage of the plant material, which may occur during the post-harvest manipulation of crops, increases the possibility of fungal contamination and should be avoided.”

§ 25: it is proposed to reword the second sentence as follows: “Alternatively, the source plant that has fallen to the ground can be collected separately and can be included in the main lot after it has been washed, cleaned, dried and evaluated for contamination”.

§ 26: it should be specified in which cases the recommended practice of covering the soil under the plant with a clean sheet of plastic during picking seems to be relevant, as it is not feasible or even useful for the harvest of certain spices (e.g in the case of large fields of chillies).

§ 27: besides mentioning the risks related to harvesting overripe crops, it might be appropriate to highlight also the risks related to harvesting unripe crops (more time needed to dry than ripe crops)

§ 28: Aflatoxins and ochratoxin A are the main mycotoxins in spices. These toxins are produced during the steps following harvest, if the crop is not dried quickly enough to safe levels, that is below  $a_w$  0,7. The Code of Practice should give more advice and examples to farmers on good drying practices in line with what has been provided under point 4.6 § 30 to §39 in the Code of Practice for the prevention and reduction of ochratoxin A contamination in coffee (CAC/RCP 69-2009).

Detailed information on drying is provided in the section “2.3 Industrial processing conditions”. The information provided in that section on good practices on drying (§ 42 to §48) are also relevant for farmers to be applied when drying is performed on the farm and therefore should be explicitly mentioned or referred to in the section of post-harvest agricultural conditions). By mentioning it only under industrial processing techniques, this might be perceived as these good practices are not applicable when the drying is performed on the farm.

Good practices as provided for the Code of Practice for the prevention and reduction of ochratoxin A contamination in coffee (CAC/RCP 69-2009) are provided as annex to these comments and the elements which are eventually not sufficiently covered in §42 and 48 in CL 2017/28-CF are highlighted in bold and italic. Reference is made to the paragraph in CL 2017/28-CF with similar or comparable practices.

§ 31: It is stated that harvested commodities that have not been dried to a safe storage moisture level should not be stored or transported in closed bins, however they should not be stored at all. If drying is not possible at farm level, the harvest should be transported to a processing plant to be dried without delay.

§ 55: it is mentioned that spices should not be stored with non-food products. The examples given “such as kerosene, lubricating oils might indeed affect the flavour of the spice but the largest risk is an unacceptable contamination of the spice with these non-food products. This should be explicitly mentioned.

**Title of point 2.3.4.1:** It is proposed to change the title to “Preventing the increase of moisture content” instead of “preventing moisture content”.

§ 41: it is mentioned “before washing with potable water”. However it is appropriate to mention that if washing is not needed it should not be carried out as washing might spread the contamination of certain hot spots to the rest of the harvest.”

§ 44: Fungi that are able to produce aflatoxins and ochratoxin A do not grow below  $a_w$  0,7, therefore the recommendation to dry to achieve a water activity as low as  $a_w$  0,6 as recommended in this paragraph might not be necessary.

§ 51: Gamma irradiation might be effective to reduce fungal growth. However, it is appropriate to clearly state that gamma irradiation does not reduce the level of mycotoxins formed earlier in the chain.

**The EUMS wish to make the following comments as regards the recommendations from the eWG to the CCCF mentioned in § 3 and § 7 of appendix II of CL 2017/28-CF:**

- Following the consideration of the above comments, the EUMS would agree to advance the proposed draft Code of practice for the prevention and reduction of mycotoxins in spices in the step procedure.
- The EUMS agree with the proposed recommendations to be made to the Committee on Food Hygiene and the Committee on Food Labelling.
- The EUMS agree to discontinue the work on the development of specific annexes to the Code of Practice, at this stage, until more information on specific management practices becomes available.

## ANNEX

**Good practices as provided for in section 4.6, §30 - §38 in the Code of Practice for the prevention and reduction of ochratoxin A contamination in coffee (CAC/RCP 69-2009)**

**The §30 - §38 in the Code of Practice for the prevention and reduction of ochratoxin A contamination in coffee (CAC/RCP 69-2009) are hereafter renumbered from §1 to § 8 (§31 being not relevant for spices)**

The elements which are eventually not sufficiently covered in §42 and 48 in CL 2017/28-CF are highlighted in bold and italic. Reference is made to the paragraph in CL 2017/28-CF with similar or comparable practices.

1. The main purpose of the drying operation is to efficiently decrease the high water content of the just harvested spices to a safe level in order to get a stable, safe and good quality product.

2. In the sun drying process, the product is spread on surfaces such as cement or brick terraces, tarpaulin, plastic canvas, bamboo and sisal mats, raised tables covered in wire mesh or fish farm netting. **(covered by § 43 and § 48 1a)**

**3. The drying process can be divided into three stages. In each stage, aflatoxin and OTA producing fungi will have varying opportunities for growth.**

**4. At the first stage, there is a slight decrease in moisture content. The high moisture content ( $a_w > 0.95$ ) provides unsuitable conditions for aflatoxin and OTA producing fungi to grow. However, other microorganisms, such as other fungi (yeasts) and bacteria, may spoil the product if it is kept too long at  $a_w > 0.95$  after harvest.**

**5. The second stage is the one of maximum loss in moisture content. During this stage ( $a_w$  lower than 0.95 but higher than 0.80), there are favourable conditions for aflatoxin and OTA producing fungi to grow and therefore it is necessary to implement precautionary measures as recommended in paragraph 8.**

**6. At the third stage ( $a_w < 0.80$ ), is much drier compared to the previous two stages. There is a slower slight decrease in the remaining moisture content. Conditions at this stage do not favour the growth of aflatoxin and OTA producing fungi.**

7. The aflatoxin and OTA-producing fungi require favourable conditions during a certain period of time to grow and produce the toxin. The level of available water is the most important factor to be considered. At high water activity ( $a_w > 0.95$ ) OTA-producing fungi will not likely grow, as fast-growing hydrophilic fungi and yeasts grow first. At lower water activity ( $a_w < 0.80$ ) the aflatoxin and OTA-producing fungi can be present but not produce the toxin, and at  $a_w$  below 0.78–0.76 they cannot grow. **Therefore the most important point is to control the period of time in which the spices remain in the drying yard, in the range of water activity where aflatoxin and OTA-producing fungi can grow ( $a_w 0.8–0.95$ ).** According to experimental results, 5 days or less in the drying yard is enough and effective to prevent aflatoxin and OTA accumulation. In general, a maximum  $a_w$  of 0.67 to 0.70 and moisture content  $< 12.5\%$  (wet basis) is sufficient for protecting spices from damage by fungi.

**(the non-highlighted part is a repetition of the information provided in §3- §6 above)**

8. Recommended measures to dry spices efficiently are:

**a) The drying yard should be located away from contaminant sources such as dusty areas and should receive maximum sun exposure and air circulation, during most of the day, to speed up the drying of the spices. Shady and low areas should be avoided.**

**b) The surface for the drying yard should be chosen according to the climate of the region, cost and quality of the dried product, as any type of surface has advantages and disadvantages. Bare soil is not appropriate for rainy areas. Plastic canvas gets humid under the spice layer, promoting fungal growth. In rainy or wet regions spices must be covered and re-spread, once the surface has dried.**

c) The pace and total time of the harvest should be based on the available area of the drying yard and the average time necessary for drying, considering both good and bad weather.

d) The following practical measures should be incorporated into the drying process:

d.1) Dry spices only in thin layers, 3 to 5 cm in depth. In some cases (e.g. low air humidity, good air circulation and sun intensity, or in usually dry regions), thicker layers can be used. **(covered by §48 1e)**

d.2) Turn over the spice layer constantly during the day time to allow faster drying, to reduce the risk of fungi growing and help to produce a better quality product. **(covered by §48 1e)**

d.3) Allow for the appropriate ventilation of the wet spice during the night in order to avoid condensation. **(covered by § 44 and §48 1e)**

**d.4) Do not mix different types of spices nor spices from different days of harvest. Use a specific identification for each one of them to identify each type of spice and day of harvest.**

d.5) Protect the drying yard area from animals, which can be a source of biological contamination for the drying spice **(covered by §45, 46 and §48 1c)**

**d.6) In order to avoid insect damage during drying, check for the presence of insects and if necessary use integrated pest management in drying yard for the control thereof.**

**d.7) Monitor the drying process regularly. Start taking samples from different points of each lot, two or three days before it is expected to be fully dry and continue re-evaluating it daily until it reaches the desired moisture content. Instrumental measurements should be adopted at field level.**

d.8) Avoid rewetting the spices because it favours rapid fungal growth and the possibility of aflatoxin and OTA production. **(covered by §48 1e)**

**e) Provide a clear and practical training for drying yard workers, including adequate use of moisture measuring equipment.**

**f) Repair, clean, protect and keep equipments in a clean storage area until the next season. Moisture measuring equipment should be regularly cross checked and calibrated once a year before harvest.**

## JAPAN

Japan appreciates the efforts of the electronic working group on the code of practice for the prevention and reduction of mycotoxin contamination in spices chaired by Spain, India and The Netherlands. Japan would like to submit the following comments in response to the request for comments at step 3.

### General Comments

Japan supports the following recommendations of the EWG:

To propose that CCFH consider the possibility of including some general practices for spices within the Code of Hygienic Practice for Low Moisture Foods, Annex III on spices and dried aromatic herbs (CAC/RCP 75-2015).

To propose that CCFL endorse the part of this COP dealing with Labeling and distribution /information to consumers.

To stop working on the annexes at this stage until more information on specific management practices becomes available.

Japan also supports the advancement of the proposed draft Code to Step 5 if the following comments are incorporated into the Code.

### Specific Comments

#### **Paragraph 2**

Japan proposes that “the lowest achievable level” in the second line be changed to “as low as reasonably achievable level” in line with the text of general principles regarding contaminants in the GSCTFF (CODEX STAN 193-1995).

GSCTFF

#### 1.3 PRINCIPLES REGARDING CONTAMINANTS IN FOOD AND FEED

##### 1.3.1 General

Contaminant levels in food and feed shall be as low as reasonably achievable through best practice such as Good Agricultural Practice (GAP) and Good Manufacturing Practice (GMP) following an appropriate risk assessment.

#### **Paragraph 6**

This Code refers various food processing techniques such as smoke drying or gamma ray irradiation, which follow the existing Codex Codes of Practice. Therefore, Japan proposes to change the sentence to read:

This Code should be used in conjunction with the Code of Hygienic Practice for Low Moisture Foods (CAC/RCP 75-2015) and its annex on spice and culinary herbs, and other relevant Codex Codes of Practice.

#### **Paragraph 7**

The recommended practices in this Code do not only address the production but also other stages. Japan proposes to add all relevant players to ensure the safety of spices in the sentence as follows.

This Code is a recommendation to which producers, transporters, processors and manufacturers in different countries should adhere as far as possible taking into account the local conditions and difficulties in implementation of all the measures specified therein while ensuring the safety of their products in all circumstances. Flexibility in the application of certain requirements of the primary production of spices can be exercised, where necessary, provided that the product will be subjected to control measures sufficient to obtain a safe product.

### Paragraph 8

An example of plant tops should be included to make it consistent with other parts, for instance, “plant tops (dried chives)”, referring to the ANNEX ON SPICES AND DRIED AROMATIC HERBS of the Code of Hygienic Practice for Low-Moisture Foods (CAC/RCP 75-2015).

Japan proposes to change the second sentence as follows:

Spices may include the aril (e.g. the mace of nutmeg), bark (e.g. cinnamon), berries (e.g. black pepper), buds (e.g. clove), bulbs (e.g. garlic), (e.g. saffron) rhizomes (e.g. ginger, turmeric), seeds (e.g. mustard), flowers or stigmas (e.g. saffron), pods (e.g. vanilla), resins (e.g. asafoetida), fruits (e.g. chilli) and plant tops (e.g. dried chives).

### Paragraph 11

The main target of this Code of Practice is the producer (as well as transporters, processors and manufacturers) of spices according to paragraph 7. Japan feels it unnecessary to include recommendation on research studies in this Code.

### Paragraph 33

Paragraph 33 of the proposed draft code reads “Gunny bags should be stored off the floor (on pallets) and away from the walls (at least 30 cm)”. While we agree with this concept, there should be scientific explanations about the value of “30 cm”.

### Paragraph 50

The term of “source material” should be changed to “source plant” in order to keep a consistency with other parts of the Code, such as paragraph 9.

### Paragraph 51

This paragraph refers to gamma ray irradiation as one of sterilization processes. It should be noted that use of food irradiation is restricted by the existing Codex documents such as GENERAL STANDARD FOR IRRADIATED FOODS (CODEX STAN 106-1983) and CODE OF PRACTICE FOR RADIATION PROCESSING OF FOOD (CAC/RCP 19-1979).

The General Standard stipulates “The irradiation of food is justified only when it fulfills a technological requirement and/or is beneficial for the protection of consumer health. It should not be used as a substitute for good hygienic and good manufacturing practices or good agricultural practices.”

Thus, the proposed Code should include these General Standard and Code of Practice as reference in the same manner as paragraph 48 or 49, or cite the above general requirement to avoid inappropriate use of irradiation.

Moreover, “gamma irradiation” in paragraph 51 should be changed to “gamma ray irradiation”.

### Paragraph 70

Paragraph 70 of the proposed draft code states, “Ventilation holes in the container are to be kept clear. Do not cover with tape.” In actual import conditions, some containers can be completely sealed to avoid moisture increase during the transportation by ship. Therefore, paragraph 70 should be deleted.

## KENYA

### REQUEST FOR COMMENTS

9. Codex members and observers are kindly invited to provide comments on the proposed draft Code of Practice for the Prevention and Reduction of Mycotoxin Contamination in Spices as contained in Appendix I.

10. In submitting comments, Codex members and observers are kindly invited to take into account the summary provided by the EWG in Appendix II in particular the recommendations in paragraphs 3 and 7.

### COMMENT

To propose the Committee to consider the proposed draft code of practice for the prevention and reduction of mycotoxins in spices for advancement in the step procedure. **Justification:** *We concur because the proposed draft provides guidance on practices for prevention and reduction of mycotoxin contamination in spices.*

To propose the Committee on Food Hygiene to consider the possibility of including some general practices for spices on hygiene (Section 2.3.4.2) and packaging (Section 2.3.5) mentioned in paragraph 2 (points V and VI) within the Code of Hygienic Practice for Low Moisture Foods, Annex III on spices and dried aromatic herbs (CAC/RCP 75-2015).

**Justification: *It will mitigate the circumstances that leads contamination of spices with Mycotoxin along the food chain***

To propose the Committee on Food Labelling to endorse the part of this COP dealing with Labelling and distribution/information to consumers (Section 2.3.6), already mentioned in paragraph 2 (point VII).

**COMMENT: *We concur with the proposal***

**NEW ZEALAND**

In response to the circular letter CL 2017/28-CF, New Zealand thanks the delegations from Spain, India and The Netherlands for the proposed draft Code of Practice for the Prevention and Reduction of Mycotoxin Contamination in Spices, and acknowledges the work done to date. New Zealand comments on the draft Code of Practice as follows.

Page 3, para 12 – firstly, for better language, we suggest that this para should start “An appropriate crop rotation....” rather than “A proper crop rotation..” Secondly, it would be helpful if the reason for this mitigation step was stated (for example, is this advice given to ensure it is less likely that the second crop is not a host for the fungi? Or the reduction n of inoculum load be stated to be achieved by the use of soil mitigation such as the use of appropriate fungicides?)

Page 4, para 16 – not only should the herbicides be registered, but they also must not adversely affect the crop plants, so suggest adding the word appropriate so the phrase reads “...or by the use of *appropriate* registered *selective* herbicides...”

Para 18 – suggest adding the word subsequent so that the phrase reads “...fungal flora and *subsequent* stimulation of other...”

Para 23 – suggest changing the end of this paragraph to read “longer time to dry *and increase the likelihood of fungus growth and mycotoxin formation.*”

Page 8, para 64 – to improve the language, the words “avoid re-entering” should read “*avoid re-entry*”.

Para 73 – it would also improve the language for the first sentence to read “*It is important to maintain ample top space between bags and the roof.*”

Para 74 – as worded, the second sentence might imply that water levels should be kept high. We suggest rewording part of the sentence to read “...*maintenance of low levels of moisture,*...” or perhaps “...*maintenance of as low level of moisture as possible,*...”

New Zealand further comments that we agree with the recommendations in paragraphs 3 and 7 of Annex II as worded.

**PERU**

**OBSERVACIONES GENERALES:**

El manejo técnico del cultivo de paprika es vital para obtener frutos de calidad, principalmente en la etapa de cosecha y poscosecha hasta su comercialización para evitar problemas de micotoxinas y por lo tanto rechazo del producto, lo cual afectaría el posicionamiento del país como exportador en el mercado internacional.

Si los frutos sufren daños por plagas o enfermedades o se cosechan frutos turgentes, demoran en el secado produciéndose pudriciones que ocasionan la presencia de micotoxinas que afectan la calidad del fruto, no siendo aptos para su comercialización.

Se recomienda que cuando los frutos han alcanzado el secado natural optimo se recojan y se almacenen bajo sombra; asimismo, que se volteen y reseleccionen constantemente para evitar la presencia de contaminantes.

**OBSERVACIONES ESPECÍFICAS:**

Estamos de acuerdo en que las hierbas aromáticas no sean incluidas en el ámbito de aplicación del presente Anteproyecto.

Por otro lado, se debe incluir en el código de prácticas, las medidas probadas y aprobadas en la Guía de Buenas Prácticas para prevenir la contaminación de Micotoxinas en *Capsicum* aprobada mediante Resolución Directoral N° 073-2010-AG-SENASA-DIAIA del 10 de junio 2010, como es el secado en túnel: Método en el cual, los frutos están protegidos por túneles de polietileno y se controla la temperatura a través del movimiento de aire. El diseño de los túneles elimina el riesgo de condensación que cae sobre el cultivo a secar: Los parámetros de procedimiento recomendable son: (i) Temperatura de aire de 71°C con velocidad constante de 2 metros/segundo y (ii) Seis (06) horas es el tiempo promedio requerido para obtener un producto final con una humedad alrededor de 5 a 6%.

## REPUBLIC OF KOREA

The Republic of Korea suggests the following minor corrections:

- #25: Delete either “washed” or “cleaned” since they both imply the same process.
- #27, 80, 82: “mycotoxins” should be corrected to “mycotoxin”
- #28: Revise “after harvest and farmers...time and when” to “after harvest, and washing if necessary, and farmers...time. When” since harvested spices can be washed before storage.
- #48-2.-1.: Revise “reduced” to “reduce”
- #51: Include a period at the end of the sentence
- #54: Delete “whether”
- #55: Revise “mycotoxin producing” to “toxigenic”
- #59: Revise “facilitates” to “can facilitate”
- #76: Revise “growth of spores” to “growth of **funga**l spores”(addition of “funga

The Republic of Korea proposes to move paragraph #11. to “Introduction” section for the consistency with Code of Practice for the Prevention and Reduction of Mycotoxin Contamination in Cereals(CAC/RCP 51-2003) in which recommendations related to scientific researches are included in the “Introduction” section.

Also, we suggest the inclusion of additional explanations on the scientific basis for the storage temperature of 5~8 degrees Celsius (para #37) and relative humidity of storage of less than 75% (para #38).

## USA

### General Comments:

The U.S. appreciates the work that Spain, India, and The Netherlands have done in preparing this draft Code of Practice and considers this Code of Practice important as it would help governments, farmers, industry and consumers in reducing mycotoxin levels in spices.

### Specific Comments:

- The U.S. agrees with the conclusions in APPENDIX II, paragraphs 2.i. to 2.vii. In particular, paragraph 2.i that states “The scope of the COP (Part B of the Introduction) has been narrowed to “Spices” (as opposed to “dried aromatic herbs or culinary herbs”) by deleting “leaf/leaves or herbs” in accordance with the discussion held at CCCF10 and the Classification of Food and Feed (CAC/MISC 4-1989).”
- The U.S. agrees with the following recommendation in APPENDIX II, paragraph 3: To propose the Committee to consider the proposed draft code of practice for the prevention and reduction of mycotoxins in spices for advancement in the step procedure (Step 5 or Step 5/8).
- The U.S. does not agree with the following recommendation in APPENDIX II, paragraph 3: To propose the Committee on Food Hygiene to consider the possibility of including some general practices for spices on hygienic practices during transportation (Section 2.3.4.2) and packaging (Section 2.3.5) mentioned in paragraph 2 (points v. and vi.) within the Code of Hygienic Practice for Low Moisture Foods, Annex III on spices and dried aromatic herbs (CAC/RCP 75-2015).
  - The Code of Hygienic Practice for Low Moisture Foods, Annex III on spices and dried aromatic herbs already includes some general (non-mycotoxin related) practices for spices related to transportation (Section VIII – TRANSPORTATION) and packaging (Section 5.4 Packaging).
  - The U.S. believes the hygienic practices specifically related to mycotoxins mentioned in paragraph 2 (points v. and vi.) are appropriate for this Code of Practice, but are not needed in Annex III of the Code of Hygienic Practice for Low Moisture Foods, which addresses contamination by pathogenic microorganisms.
- The U.S. does not object to the following recommendation in APPENDIX II, paragraph 3: “To propose the Committee on Food Labeling to endorse the part of this Code of Practice dealing with Labeling and distribution/information to consumers (Section 2.3.6), already mentioned in paragraph 2 (point vii.)”
- The U.S. agrees with the following recommendation in APPENDIX II, paragraph 7: To stop working on specific Annexes to the General Code of Practice at this stage until more information on specific management practices become available.

**AU**

**Position:** AU supports having a code of practice for the prevention and reduction of mycotoxin contamination in spices and recommends that the current revised CoP which has included smoke drying, a common African practice, to be considered for advancement to step 4. We also support the other recommendations made by the EWG.

**Rationale:** Based on previous discussions and information submitted to CCCF, CCCF9 agreed that there was enough information to proceed with the development of a CoP to prevent and reduce mycotoxin contamination in the prioritized spices (chili, paprika, nutmeg, ginger, turmeric, pepper, clove, garlic, sesame seed and mustard seed), with focus on aflatoxin and ochratoxin A as the toxins to target.

The current revised draft CoP covers GAP, GMP and GSP, and has integrated the comments and recommendations of CCCF10 by including packaging technologies and smoke drying practices (which is a common African practice). The guidance provided in the CoP are necessary for managing food safety risks associated with mycotoxin contamination in spices. Implementation of the CoP will therefore contribute to protect consumer health and enhance international trade. We therefore support the advancement of the CoP in the step procedure.