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FOOD AND AGRICULTURE  
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Agenda Item 12

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

Second Session

The Hague, the Netherlands, 31 March - 4 April 2008

### PROPOSED DRAFT CODE OF PRACTICE FOR THE PREVENTION AND REDUCTION OF AFLATOXIN CONTAMINATION IN DRIED FIGS (N10 – 2007)

*Comments submitted at Step 3 by Brazil and Morocco*

#### **BRAZIL**

*Page 3, Paragraph 7*

The expression “epidemic risk” is inappropriate; we suggest replacing it for “aflatoxin contamination”. The title of item a) “risk analysis” should be replaced by “regional risk information”

*Page 6, Paragraph 40*

We suggest deleting “Suitable ventilation and coverage should be used in the raining weather”; the sentence “During transportation, increase of moisture and temperature must be prevented” already covers the issue.

*Page 7*

We suggest changing the paragraph 50 as following:

The moisture content and water activity level of dried fig fruits must be below the critical level (moisture content can be set at 24% and water activity  $\leq 0.62$ ). Higher levels may trigger fungal growth and toxin formation, such as aflatoxin and ochratoxin A, in areas of high temperature storage at the processing plant or at retail level, especially in moisture tight packaging material.

*Page 9, Reference 13:*

Iamanaka, B.T.; Menezes, H.C.; Vicente, E.; Leite, R.S.F. & Taniwaki, M.H. 2007. Aflatoxigenic fungi and aflatoxins occurrence in sultanas and dried figs commercialized in Brazil. Food Control, 18 (5): 454-457.

#### **MOROCCO**

Morocco is pleased to offer the following comments and proposals:

(Proposed texts are underlined and deletions are struck out.)

#### INTRODUCTION

*Para 1*

1. ....It is important for producers to realize that Good Agricultural Practices (GAP) represent the primary line of defence against contamination of dried figs with aflatoxins, followed by the implementation of Good Manufacturing Practices (GMP) and Good Storage Practices (GSP) during the handling, processing, packaging, storage and distribution of dried figs for human consumption. Only by

effective control at all stages of production and processing, from the ripening on the tree through harvest, drying, processing, storage, transportation and distribution can the safety and quality of the final product be ensured. However, the complete prevention of mycotoxin contamination in ~~(UK)~~ commodities, including dried figs, has been very difficult to achieve [in some countries such as UK](#) (1, 12, 13, 15, 19).....

#### Para 6

6. The aflatoxin-producing *Aspergillus* species and consequently dietary aflatoxin, contamination is ubiquitous in areas of the world with hot humid climates. *A. flavus/A. parasiticus* cannot grow or produce aflatoxins at water activities less than 0,7; relative humidity below 70 % and temperatures below 10 °C ([figures should be coherent throughout text, see paras 6,35,38,43,46](#)).

#### Para 7

7. Application of the following preventive measures is recommended in dried fig producing regions in order to reduce epidemic risk by application of good practices:

##### a) Risk analysis

Ensure that regional/national authorities and grower organisations:

- Sample dried figs representatively for analysis to determine the level and frequency of aflatoxin contamination; [sampling should reflect differences in areas, time of the year and stage from production to consumption](#)
- Combine this information with regional risk factors including meteorological data, cultural
- practices and propose adapted [risk](#) management;
- Communicate this information to growers and other operators along the chain. [Use labelling to inform consumers and handlers on storage conditions](#)

##### b) Training of producers.

Ensure training of producers with regards to:

- Risk of mould and mycotoxins;
- Conditions favouring aflatoxigenic fungi and period of infection;
- Knowledge of preventive measures to be applied in fig orchards.
- [Pest control techniques](#)

##### c) Training of transporters, storage keepers and other operators of the production chain.

Ensure training regarding the practical measures and environmental factors that promote infection and growth of fungi in dried figs resulting in a possible secondary production of aflatoxins at post harvest handling and processing stages. Besides these, all applications should be documented.

##### [d\) Encourage research on resistant varieties of figs](#)

#### Para 35 (under 3.6 DRYING)

35. Drying area and time are important factors in aflatoxin formation. The moisture content of the partially dried and shriveled fig, fallen down from the tree, is approximately 30-50 % and these fruits are more susceptible to physical damage than the fully dried fig fruits that have approximately 20-22 % moisture content([figures should be coherent throughout text, see paras 6,35,38,43,46](#)). Good soil management that reduces particle size and smoothens the surface before harvest is therefore necessary to reduce the risk of damaging.

#### Para 38

38. Figs that are dried, possessing moisture  $\leq 24$  % and water activity  $\leq 0.62$ ([figures should be coherent throughout text, see paras 6,35,38,43,46](#)), should be picked from the trays. The fully dried fruits should be collected from the trays preferably in the morning before the temperature of the fruits increase and soften but after the dew goes away. The trays should be re-visited at short intervals to collect fully dried figs. Dried figs taken from drying trays must be treated ([give examples of treatment](#)) to prevent storage pests with a method allowed in the legislation of each country, for the intended use.

### 3.7 TRANSPORTATION

This whole section, paras 40 to 42, could be eliminated if we agree on having either processing at farm or drying at processor.

#### *Para 43(under 3.8 STORAGE)*

43. Figs must be properly cleaned, dried and labelled when placed in a storage facility equipped with temperature and moisture controls. The shelf life of dried figs can be prolonged, if they are dried to a water activity value at which molds, yeasts and bacteria cannot grow (water activity<0.65) (figures should be coherent throughout text, see paras 6,35,38,43,46). In case further hot spots are formed where temperature and moisture increases, secondary aflatoxin/ochratoxin A formation may occur. Because of this reason, any possible source enhancing humidity of the dried fruits or of the surrounding environment must be eliminated. Direct contact of dried fig containers with floors or walls need to be prevented by placing a palette or a similar separator.

#### *Para 46*

46. The optimum storage conditions for dried figs are at temperatures of 5-10 °C and relative humidity less than 65 %(figures should be coherent throughout text, see paras 6,35,38,43,46).Therefore a cold chain should be designed and enforced.

#### *Para 47 (under 3.9 PROCESSING)*

47. Dried figs are fumigated, stored, sized, washed, cleaned, sorted and packed in processing units. Among these processes, removal of aflatoxin-contaminated figs, storage and package material may exert the major impact on aflatoxin levels of the final products. Fungicides and preservatives could be used according to international standards.

#### *Para 50*

50. The moisture content and water activity level of dried fig fruits must be below the critical level (moisture content can be set at 24 %)(figures should be coherent throughout text, see paras 6,35,38,43). Higher levels may trigger fungal growth and toxin formation. Higher water activity levels (give figure) may trigger secondary aflatoxin/ochratoxin A formation in areas of high temperature storage at the processing plant or at retail level especially in moisture tight packaging material.

#### *Para 52*

52. Good storage practices must be applied at the processing plant and should be kept at this standard until the product reaches the consumer (see ~~article 45~~section 3.8).

### 4. A COMPLEMENTARY MANAGEMENT SYSTEM TO CONSIDER IN THE FUTURE

Morocco proposes that this whole section should be enforced or deleted.

#### *Para 57*

57. It is recommended that resources be directed to emphasizing the Good Agricultural Practices (GAPs) at the pre-harvest level and Good Manufacturing Practices (GMPs) and Good Storage Practices (GSPs) during drying, storage, processing and distribution of various products. ~~The ISO 22000 system should be built on sound GAPs, GMPs and GSPs~~Codex should not prefer one standard over another