

codex alimentarius commission



FOOD AND AGRICULTURE
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Agenda Item 8

**CX/CF 08/2/8 Add.1
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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 REDUCTION OF ACRYLAMIDE IN FOOD (N06-2006)

Comments at Step 3 submitted by Brazil, Japan and CIAA

BRAZIL

Brazil thanks the Drafting Group for the document.

Brazil also would like to suggest including cassava flour as an ingredient that can replace potato and wheat flour. Products made with cassava flour presented the lowest concentrations of acrylamide according to the article "Determination of acrylamide levels in selected foods in Brazil" (Food Additives & Contaminants Volume 24, Issue 3 March 2007, pages 236 - 241).

JAPAN

Japan appreciates the effort of the electronic working group led by the United States of America and United Kingdom in preparing the draft of Code of Practice and is pleased to offer the following comments.

Para.4

1. A new section on scope should be set in lieu of para.4, where the target users should be clearly stated. We propose to delete the current paragraph 4 and add the following texts.

“SCOPE

4. This Code of Practice intends to provide national and local authorities, manufactures and other relevant bodies with guidance to prevent and reduce formation in potato products and cereal products. The guidance covers three strategies (where information is available) for reducing acrylamide formation in particular products:

- i. Raw materials;
- ii. Control / addition of other ingredients; and
- iii. Food processing and heating. ”

2. If no mitigation techniques are identified for coffee on a commercial basis before the final adoption of the Code, coffee should be deleted from the scope of the Code. We may be able to add coffee to the scope when such techniques become available.

The names of concerned foods

3. There should be a consistent way in describing the names of concerned foods in the text of the Code of Practice. The names of foods including potato products and cereal products should be preferably described in the text fully as different terms may be used for one commodity and/or one term may mean different things in different countries.

The following terms are used in the text.

Potato products,
French fries,
Potato crisps,
Crisps
Potato snacks,
Potato-based snacks,
Fried or roasted potatoes,
“Oven” French fry

Cereal based products,
Bread,
Crispbread,
Biscuits/bakery wares,
Biscuits/pastries,
Breakfast Cereals,
Baked product,
Wheatdough based products
Rolls/toasted bread

Para.21

4. Concerning the levels of “less than 0.3 %” for crisp and “less than 0.4 %” for French fries”, scientific explanation would help readers to understand how strictly these levels should be observed and the impact of reduced sugar content exceeding these levels on acrylamide content, although we agree that the reducing sugar content should be as low as technically possible.

Paras 49 and 50

5. The role in advising consumers is not only played by national and local authorities. Others such as industries, retailers and consumer organizations are also expected to play some important roles. These related parties should be involved in the practices mentioned in paragraph 49 and 50.

CIAA

CIAA, as a member of the electronic working group on the establishment of the proposed draft Code of Practice for Reduction of Acrylamide has actively contributed to the revision of the initial draft paper. We believe the revised text is very reasonable and reflects very well tools to try to mitigate acrylamide, without being however an overall prescriptive manual. It is obvious that individual mitigation measures are to be used in the necessary relevant combinations to mitigation formation - and are not mandatory measures which should all be applied, for all scenarios.

We offer a few remaining suggestion to further improve the text as regards:

Please add the following new paragraph (as para.18) to the “Element Considered” section in page 2 of CX/CF 08/2/8:

18. In view of the important contribution to acrylamide from foods produced in domestic kitchens and restaurants it is recommended that the best practices, developed by the food industry, should be used to develop guidelines for the reduction of acrylamide in the home and restaurant situations.

Suggested changes to the Proposed Draft Code are as follows (additional texts are underlined and deletions are in strikeout.):

Introduction:

Paragraphs 1 and 3

1. Recent concern over the presence of acrylamide in food dates from 2002. Swedish scientists⁵ reported that up to “mg/kg” quantities of acrylamide could be formed in carbohydrate-rich foods during high temperature cooking, e.g., during frying, baking, roasting, toasting and grilling. These findings were rapidly confirmed by other researchers;⁶ subsequently, major international efforts have been mounted to investigate the principal sources of dietary exposure, assess the associated health risks and develop risk management strategies.^{7,8,9,10,11,12} Details of these global research initiatives are provided on the WHO/FAO Acrylamide Information Network (<http://www.acrylamide-food.org/>) and the "Acrylamide Information Base"⁸ http://ec.europa.eu/food/food/chemicalsafety/contaminants/acryl_database_en.htm.

3. The Joint FAO/WHO Expert Committee on Food Additives (JECFA)¹¹ has undertaken a comprehensive analysis of acrylamide occurrence data from 24 countries, the majority tested originating from Europe and North America. It was concluded that the major contributing food groups were French fries^b, potato crisps^c, coffee, biscuits^d/pastries, bread and rolls/toasted bread. The full extent of acrylamide present throughout the diet remains unclear.

Toxicology Section

Paragraph 11, point iv

iv. it would be useful to have occurrence data on acrylamide in foods as consumed across a broad range of diet types and in developing countries

Paragraph 16:

16. JECFA evaluated the safety of the enzyme asparaginase from *Aspergillus oryzae* expressed in *Aspergillus oryzae* for use as a food additive at its 68th meeting in June 2007.⁴³ Asparaginase has potential use in depleting levels of the acrylamide precursor asparagine in food. JECFA found that asparaginase had an Acceptable Daily Intake (ADI) that was “not specified” when used in the applications specified and in accordance with good manufacturing practice. The category of ADI ‘not specified’ is used to refer to a food substance of very low toxicity. This is generated on the basis of the available data (chemical, biochemical, toxicological and other) and the total dietary intake of the substance arising from its use at the levels necessary to achieve the desired effects and from its acceptable background levels in food, does not, in the opinion of JECFA, represent a hazard to health⁴³.

GENERAL CONSIDERATIONS AND CONSTRAINTS IN DEVELOPING PREVENTATIVE MEASURES.

Paragraph 17, point i

i. When preventative measures for acrylamide are considered, thought should be given to ensuring that they will not result in an increase in other process contaminants. These include Nnitrosamines,⁴⁴ polycyclic aromatic hydrocarbons,⁴⁵ chloropropanols,⁴⁶ ethyl carbamate,⁴⁷ furan,⁴⁸ heterocyclic aromatic amines and amino acid pyrolysates.⁴⁹

RECOMMENDED PRACTICES TO INDUSTRY FOR THE MANUFACTURE OF POTATO PRODUCTS (FRENCH FRIES, POTATO CRISPS, POTATO SNACKS).

THE MITIGATION MEASURES DISCUSSED IN THE FOLLOWING SECTIONS ARE NOT LISTED IN ORDER OF PRIORITY. IT IS RECOMMENDED THAT ALL REDUCTION MEASURES ARE TESTED TO IDENTIFY THE MOST SUCCESSFUL FOR YOUR OWN PRODUCT.

We propose a number of amendments/additions, as follows, to the wording of the Summary chart:

Summary

Control/addition of other ingredients

Box 1

In the case of potato-based snacks produced from doughs, where possible, replace some of the potato with other ingredients with lower reducing sugar/asparagine content e.g. rice flour Avoid or minimise the addition of reducing sugars (e.g., as browning agent, spice carrier or coating).

Raw material

Paragraph 21 points ii and iv

ii. Cultivar⁵⁸ - Select cultivars with reducing sugar contents of less than 0.3 % for crisps, 0.4% for French fries on a wet weight basis for high temperature cooking processes such as frying and baking.⁴ The selection of suitable cultivars varies considerably country by country.

iv. Reconditioning temperature and time^{59,62} - Potatoes that have been stored at low temperatures should be reconditioned as required over a period of a few weeks at higher temperatures (e.g., 12 –15 °C).^{59,62} The decision to recondition stored potatoes should be made on the basis of the results of fry testing.

Control/addition of Other Ingredients

Paragraph 24

For reconstituted or formed potato-based snacks produced from potato doughs, ~~where possible include~~ other ingredients with lower reducing sugar/asparagine content can sometimes be used in some products to partially replace the potato⁶² e.g., rice flour.

Food Processing and Heating

Paragraph 28

Decrease the surface area can be employed; for example in French fries, by cutting potatoes into thicker slices; 14x14mm strips have been shown to have lower acrylamide levels than fine cut strips (8x8mm) or removal of fines (fine pieces of potato) before or after frying to reduce levels of acrylamide in fried or roasted potatoes.^{62,71,72}

Paragraph 29

Washing, blanching or par-boiling treatments can be employed to leach the asparagine/reducing sugar reactants from the surface of the potato before the cooking step.^{73,74} Various reagents can also be added during the latter stages of blanching to further reduce levels of acrylamide, these include, treatment of French fries with sodium acid pyrophosphate,^{4,62} treatment with calcium salts,⁶² and the salts of a number of other di- and trivalent cations (this method has been shown to reduce acrylamide formation in French fries made from potato dough⁷⁵) and blanching in sodium chloride solution⁷⁶ (though this method may increase dietary exposure to ~~salt~~ sodium).

Paragraph 34

This paragraph should be deleted as it is a repeat of paragraph 27

RECOMMENDED PRACTICES TO INDUSTRY FOR THE MANUFACTURE OF CEREAL BASED PRODUCTS (BREAD, CRISPBREAD, BISCUITS/BAKERY WARES, BREAKFAST CEREALS).

THE MITIGATION MEASURES DISCUSSED IN THE FOLLOWING SECTIONS ARE NOT LISTED IN ORDER OF PRIORITY. IT IS RECOMMENDED THAT ALL REDUCTION MEASURES ARE TESTED TO IDENTIFY THE MOST SUCCESSFUL FOR YOUR OWN PRODUCT.

Summary

Control/addition of other ingredients

Box 3 – Bread:

Avoid or minimise ~~using~~ the use of reducing sugars in the recipe.

The addition of calcium salts, e.g. calcium carbonate may reduce the formation of acrylamide.

Box 4 – Breakfast Cereals:

Minimise reducing sugars in the cook phase.

Consider the contribution of other inclusions e.g. roasted nuts, dried fruits and whether they are necessary if they are in a form that potentially can add a significant level of acrylamide.