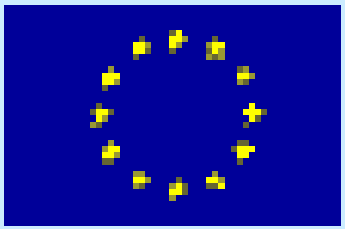
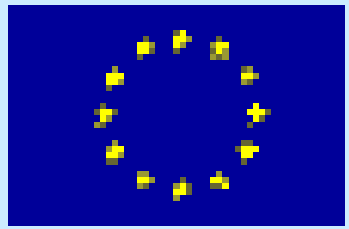
JIFSAN Workshop on Acrylamide, 13-15 April 2004

An EU Perspective on Acrylamide in Food



Dr Martin Slayne



European Commission

Directorate General Health & Consumer Protection

Chemical and physical risks; surveillance

OVERVIEW

- The Acrylamide issue
- EU Commission approach
- Activities
- Ways to lower levels of acrylamide in food
- State of progress
- What next?

THE ACRYLAMIDE ISSUE

- April 2002, highlighted by Sweden
- High levels in carbohydrate-rich foods cooked or processed at high temperatures e.g. potato and cereal products
- Toxic properties - industrial use, environmental/ occupational exposure
- Findings in food confirmed by other workers
- Investigations into presence in food and risk

EU COMMISSION APPROACH

- Scientific Committee on Food, 3 July 2002
  - genotoxic + carcinogenic properties
  - more data needed

  (reducing levels, formation, exposure, bioavailability, mode of carcinogenic action, intake/ toxicity, biomarkers, epidemiology)
  - clarify safety implications in food
  - reduce levels to ALARA, but how?

- Member States + stakeholders

ACTIVITIES

- Commission Stakeholder Meetings: Expert Group of the Standing Committee on the Food Chain & Animal Health
- European Parliament
- European Food Safety Authority
- Joint Research Centre
- Directorate General for Research

Stakeholders Meeting
Brussels,15-16 October 2002

- Food producers, processors, caterers, retailers, consumers, Member States
- EU co-ordination needs identified
- Future advice to consumers

European Parliament

- Investigate
- Might be unavoidable to some extent
- Reduce in foods where high levels found
- Reduce in foods for children

Summary of EU Research Activities (Information Base – EFSA)

- Website Feb 2003: 10 study areas, 98 studies
- Updated Jan 2004: 156 studies

1) Levels in food *31*
2) Dietary exposure *11*
3) Ways to reduce levels *31*
4) Mechanisms of formation *16*
5) Bioavailability *5*
6) Toxicology/ carcinogenicity *9*
7) Biomarkers *5*
8) Epidemiology *2*
9) Methods of analysis *28*
10) International *18*

http://europa.eu.int/comm/food/food/chemicalsafety/contaminants/acryl_database_en.htm

European Food Safety Authority (EFSA)

- EU research updates/ Information Base
- Workshop on research gaps, 28 March 2003
  Dutch Food Authority VWA
  - Report submitted to EFSA Advisory Forum
- Workshop on formation in food, 17 Nov 2003
  - Difficulties to influence formation and maintain quality
  - Areas for study: effects of water, ammonium bicarbonate, chemical or enzymatic interruption of formation, profiles of acrylamide precursors, optimisation of storage conditions
- Future opinion on approaches for genotoxic carcinogens
- Update to SCF opinion of 2002 on acrylamide?

www.efsa.eu.int

Joint Research Centre

- Method evaluation, validation, reference materials
- Analytical methods workshop 28-29 April 2003
- Proficiency testing: cookies + crispbread
  - variable inter-lab results
- Task group: extraction problems identified
- Review on analytical methods, published in Food Additives and Contaminants, Vol. 20, p. 885 (2003)
- Data collection on levels in foods, collaboration with CIAA
  - 1600 data, QA checked (e.g. potato fries 444, crisps 426, crispbread 211, breakfast cereals 75…)
  - no clear patterns of reduction since 2002

http://irmm.jrc.cec.eu.int/ffu/acrylamide.html

Directorate General for Research

- Framework 6 Research Programme
  Theme ‘Food Quality & Safety’:

  Health risks from heat-treated foods and food products ‘HEATOX’

  23 partners world-wide

  Timescale: 2003 - 2006

http://europa.eu.int/comm/research/fp6/index_en.html
http://www.slv.se/templatesHeatox/Heatox_default____8424.asp

Stakeholders Meeting
Brussels, 20-21 October 2003

- Food producers, processors, caterers, retailers, consumers, institutes, Member States

- Progress on ways to lower levels of acrylamide formed in food
  - Most findings on fried and baked potato and cereal products
  - Reducing sugars and asparagine, high temperature, low moisture
  - Acrylamide levels can be lowered in some foods

- Note on website

  http://europa.eu.int/comm/food/food/chemicalsafety/contaminants/acryl_guidance.pdf

WAYS TO LOWER LEVELS OF ACRYLAMIDE IN FOOD

- Factors for potato and cereal products: high reducing sugars (e.g. glucose, fructose) and asparagine, select raw materials, adjust heating/processing, storage…
- Examples:
  - Avoid excess browning/ overcooking (balance formation/ destruction in some cereal products)
  - Adjust processing/ cooking times (quality/ texture)
  - Adjust processing/ cooking temperatures e.g. cut potato products: fry <175°C,oven bake <200°C (accurate equipment?)
  - Pre-blanch/ soak potato before frying (drain) or baking
  - Lower pH e.g. 0.5 - 1 % citric acid 20 mins (souring problem?)

- Avoid storing potatoes < 8°C
  (anti-sprouting considerations?)
- Select raw materials with low reducing sugars/
  asparagine (retailers could label)
- Avoid e.g. glucose coatings for part-cooked potato products
  intended for home oven baking
- Ingredients
  e.g. alternative raising agents to ammonium carbonate
- Avoid use of ‘rework’ where known to increase acrylamide
  (effects of multiple baking not clear/ complex products)
- Interrupt asparagine interaction using enzymes
  e.g. asparaginase?

- Coffee?
  - Roasting procedures?

General Guidance Information

- Producers, processors, retailers, caterers:
  - be aware of ways shown to lower levels of acrylamide
  - review cooking practices/ instructions on packets, avoid high temperatures (N.B. flash frying at high temperatures can lower acrylamide e.g. potato crisps)
  - follow best practice to lower levels
- Consumers:
  - avoid excess browning of fried and baked potato and cereal products
  - aim for golden yellow rather than brown
- Researchers
  - laboratory scale reductions vs commercial practice

STATE OF PROGRESS

- EU co-ordination of activities
- Information exchanged worldwide
  - WHO/FAO Infonet (JIFSAN)
  - Codex Committee on Food Additives and Contaminants (Arusha, March 2003, Rotterdam, March 2004)
- Levels in some foods can be lowered
- Most progress on potato and cereal products, complex product ranges, other foods affected
- Acrylamide is a genotoxic carcinogen, safety implications in food remain unclear

WHAT NEXT?

- Ongoing studies/ collaboration in all areas
- Clarify safety implications
- Risk assessment in 2005 (data for JECFA)
- **Raise awareness** of producers, processors, caterers and retailers to ways shown to lower acrylamide levels
- Encourage investigations to reduce the formation in different product types
- **Where feasible lower the levels in products**

Risk Management Options?

- Guidance/ Codes of Practice?
  - producers, processors, caterers, retailers…
- Advice to consumers?
  - dietary, food preparation, cooking…
- Administrative/ Governmental measures?
  - target or signal levels/ minimisation strategy? (e.g. in Germany)
  - legal limits?

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Elke Anklam
Joint Research Centre, European Commission

Achim Boenke
Directorate General for Research
European Commission

Djien Liem
European Food Safety Authority

E-mail: martin.slayne@cec.eu.int

http://europa.eu.int/comm/food/food/chemicalsafety/contaminants/acrylamide_en.htm