Dietary exposure assessment to hazardous substances: achievements made so far and future challenges

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GUIDEA Launch Meeting
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Dietary exposure assessment

Chemical Occurrence

Exposure Assessment

Food Terminology

Food consumption

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Outline of the presentation

• EFSA Comprehensive European Food Consumption Database
• Food classification for exposure assessment
• Chemical occurrence data in EU risk assessments
• Dietary exposure assessment methodology
EFSA Comprehensive European Food Consumption Database
EFSA Comprehensive European Food Consumption Database

- Individual food consumption data provided to EFSA:
  - the most recent data within the country;
  - at the finest level of detail;
  - for different age classes (from infants to elderly);
  - representative at national or regional level;

- Summary statistics of the Comprehensive Database published on the EFSA website together with a guidance document.
## Magnitude of the database

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary surveys</td>
<td>32</td>
</tr>
<tr>
<td>Member States</td>
<td>22</td>
</tr>
<tr>
<td>Number of subjects</td>
<td>66,492</td>
</tr>
<tr>
<td>Number of different foods</td>
<td>63,495</td>
</tr>
<tr>
<td>Number of different FoodEx codes</td>
<td>1,504</td>
</tr>
<tr>
<td>Number of consumption records</td>
<td>6,309,489</td>
</tr>
</tbody>
</table>

The Comprehensive Database will be updated in 2013-14 with the addition of 10 new surveys.

European Food Safety Authority (2011) Use of the EFSA Comprehensive European Food Consumption Database in Exposure Assessment. EFSA Journal 9(3):2097. [34 pp.]
Methods used in dietary surveys included in the Comprehensive DB

Different consumption patterns between countries can simply be induced by the survey methodology.

Examples of differences in survey methodology:

• 24 h dietary recall vs. food record
• broad survey period, from 1997 (Estonia) to 2009 (Spain)
• from 1 to 7 days per subject
• individual vs. household sample unit
• from 28% to 98% response rate
• week end days not evenly represented in 6 surveys
• seasonality not fully covered in 10 surveys (only one season represented in 4 surveys)
• body weight and height measured or estimated
• food classification
Towards the EU Menu era: harmonised food consumption data collection

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What’s on the menu in Europe?

Aims to collect food consumption data at EU level:

- in different age classes (from infants to elderly)
- in all Member States (minimum 80,000 subjects in total)
- using methods allowing the comparison of the results from different Member States
- using the EPIC soft, or comparable software
- including anthropometric measurements
Countries involved in the EU Menu activities

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Evolution: consumption data

**CONCISE**
Broad categories, not covering children, not harmonised, no FFQ

**COMPREHENSIVE**
Detailed categories, partly covering children, not harmonised, no FFQ

**EU Menu**
Detailed categories, covering children, harmonised including FPQ

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Food classification for exposure assessment
FoodEx

Food list: ~1,700 end-points (food names, generic food names)
Hierarchical structure, up to 4 levels, not equal branching
- 20 main food groups
- 2nd level composed by ~160 items

Structured on child-parent relation

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Food as consumed vs. RACs

Raw Agricultural Commodity (RACs)

Conversion factors

Individual ingredient

List of ingredients and proportions

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to ensuring that Europe’s food is safe
Evolution food terminology

**CONCISE**
15 broad categories and 13 sub-categories
Ad hoc EC requests

**FOODEX 1**
Hierarchical system with four levels
Addressing legislation

**FOODEX 2**
Harmonised hierarchical system with facets linked to core food list

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Chemical occurrence data in EU risk assessments

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Data providers

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From chaos .... to order

Standardisation e harmonization

Coordinated approaches
Standard protocols
Compatible systems

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Total Diet Studies

Creating a basket of foods representative of food consumption

Analysing for a range of beneficial or harmful chemicals

Stratified sampling covering regions and seasons

Preparing food for consumption and pooling of samples

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Evolution chemicals data

**AD HOC**
- Ad hoc requests
- Different coding
- Irregular submissions

**SYSTEMATIC**
- Set substance list
- Standardised coding
- Annual submissions

**TOTAL DIET STUDY**
- Needs driven approach
- Coordinated testing
- Harmonised framework

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Dietary exposure assessment methodology
Methodological improvements (1)

Methods to estimate usual intake RIVM and Wageningen Univ. (2012) Scientific reports from the European Tool Usual Intake (ETUI) project. EFSA website.

Harmonization in exposure assessment methodologies
EFSA (2011). Overview of the procedures currently used at EFSA for the assessment of dietary exposure to different chemical substances. In EFSA Journal, 33 pp.

Probabilistic exposure assessment
Evolution exposure

ASSUMPTIONS
Model diets
Proxy for occurrence
Fine for screening

DETERMINISTIC
Consumption distribution
Mean occurrence
All or consumers only

PROBABILISTIC
Consumption and
occurrence distribution
Uncertainty evaluation
Habitual intake

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Thank you!

Questions:
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