Recording of Fluid and Water Intake at Population Level in Europe

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Conflict of interest regarding this presentation:

I wish to declare a potential conflict of interest, and that I have received either direct or indirect industry support in relation to all or part of the results presented here.
Adequate Intakes (AI) have been defined derived from a combination of observed intakes in population groups with desirable osmolarity values of urine and desirable water volumes per energy unit consumed.

Intakes from population studies were key
What surveys did EFSA use?

• Not clear from report
• Water intake from some European countries (Table 2)
  • France, Germany, Italy, Sweden, The Netherlands, UK, Belgium
• SENECA (Table 4)
  • Portugal, Switzerland, Poland, Denmark, France, Italy, The Netherlands, UK, Belgium
## Methodologies

<table>
<thead>
<tr>
<th>Country</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary</td>
<td>3 x 24h recall</td>
</tr>
<tr>
<td>Norway</td>
<td>FFQ</td>
</tr>
<tr>
<td>Iceland</td>
<td>24 h recall</td>
</tr>
<tr>
<td>Ireland</td>
<td>7 d record</td>
</tr>
<tr>
<td>Belgium</td>
<td>2 x 24h recall + FFQ</td>
</tr>
<tr>
<td>UK</td>
<td>7 d record</td>
</tr>
<tr>
<td>Italy</td>
<td>7 d record</td>
</tr>
<tr>
<td>Germany</td>
<td>4 wk recall + FFQ</td>
</tr>
<tr>
<td>France</td>
<td>7 d record</td>
</tr>
</tbody>
</table>
Key issues

• Nutritional surveys are **FOOD** surveys
• Food diaries are designed to estimate energy and nutrients
• Fluid intake is recorded during food consumption times
• Most fluid intake outside meals – **NOT** recorded
• Food diaries **NOT** specifically designed to record fluid & water intake
FOOD INTAKE METHODOLOGY TASK FORCE EXPERT GROUP ON

‘ADEQUATE METHODOLOGIES FOR RECORDING FLUID AND WATER INTAKE AT POPULATION LEVEL’
Survey description

• Frequency
  • Variable, depends on funding, UK rolling programme

• SES
  • Representative, low income represented?

• Sample
  • Representative of country, weighting if necessary
<table>
<thead>
<tr>
<th>Category</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age groups</td>
<td>Variable</td>
</tr>
<tr>
<td>Seasonality</td>
<td>Most all seasons</td>
</tr>
<tr>
<td>Sample size</td>
<td>Variable 500 subjects – 19,329</td>
</tr>
<tr>
<td>Response rates</td>
<td>54 %</td>
</tr>
<tr>
<td>Sweden</td>
<td>36 % Food records; 43 % FFQ</td>
</tr>
</tbody>
</table>
## Methodologies

<table>
<thead>
<tr>
<th>Methodology</th>
<th>Number of countries</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeated (x2) 24h recall</td>
<td>3</td>
<td>1 – frequency questions 4 – 6 weeks apart</td>
</tr>
<tr>
<td>Estimated food diary</td>
<td>2</td>
<td>4 days – random start day 7 days</td>
</tr>
<tr>
<td>Weighed food diary</td>
<td>1</td>
<td>4 days</td>
</tr>
<tr>
<td>FFQ</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Mixed methodologies</td>
<td>3</td>
<td>Children – food diary; adults - 4 hour recall + FFQ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Adolescents - 3 day food diary; adults – repeated 24 hour recall + FFQ</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Diet history, 2x24 hour recall, 3 day food diary each applied separately to a subsample of the sample</td>
</tr>
</tbody>
</table>
Data quality

• Completeness checks
  • 7 Interviews or follow up phone calls
  • 1 Used energy intake
    • Black/Goldberg equations
  • 1 Questionnaire completed on blood sampling day
• Data cleaned - 3
• **NONE** adjust volume adjustment if reported volume is zero or very low
Drinking acts

• All described capturing all drinking acts
  • Specific questions in interviewer
  • In diary by time/location
  • Pre-coded record book

• All reported capturing drinking outside/between meals

• Only 1 country has no special instructions, does not capture drinks outside meals
Volume estimates

• 7 Household measures
• 7 Photobook
• 1 Weighed
• 1 Both

• 1 Standard glass (200 ml)/cup (150 ml)
• 1 16 different glasses/cups/bowls
  80 – 250 ml
Volume drunk or served

• 4 Volume drunk

• 5 Volume served
Food

• Liquid foods (e.g. soup)
  • Inconsistent recording
  • Type, recipe
• Additions recorded
  • Milk, sugar
• Water content of food
  • 4 countries calculate
  • RoI 33% (EFSA 20 – 30%)
Cordials, concentrates, powders

- Dilution factors
  - 2 As consumed
  - 4 Water, product separate or disaggregates
  - UK – if not given set dilution factors depending on age and ‘strength’ if known used

- 3 Record as product + water
- 3 Record as prepared drink
- 1 Age dependent
Food composition analysis database

- 7 Country specific
- 1 Neighbouring country
  - RoI use UK database
- 9 Code for water
- 9 Water categorised e.g. still, tap, sparkling
# Categorisation

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>10</td>
</tr>
<tr>
<td>Type of water</td>
<td>9</td>
</tr>
<tr>
<td>Flavoured water</td>
<td>5</td>
</tr>
<tr>
<td>Milk &amp; milk products</td>
<td>10</td>
</tr>
<tr>
<td>Hot beverages</td>
<td>8</td>
</tr>
<tr>
<td>Still soft drinks</td>
<td></td>
</tr>
<tr>
<td>- Regular</td>
<td>8</td>
</tr>
<tr>
<td>- Diet/low calorie</td>
<td>8</td>
</tr>
<tr>
<td>Carbonated</td>
<td></td>
</tr>
<tr>
<td>- Regular</td>
<td>8</td>
</tr>
<tr>
<td>- Diet/low calorie</td>
<td>8</td>
</tr>
<tr>
<td>Functional drinks</td>
<td>4</td>
</tr>
<tr>
<td>Alcohol</td>
<td>9</td>
</tr>
</tbody>
</table>

NB Definitions variable
Biometric data

- 9 Weight, height – BMI
- 3 Waist, hip circumferences
- 3 Physical activity
  - 1 Accelerometry
  - 1 Diary
- 1 Body fat (?method)
- 1 Blood sample - unspecified
- 1 BP, blood & urine samples
  - Vitamins, minerals, lipids, CRP

NB None use hydration markers
RECOMMENDATIONS
Development of **validated** methodology

- Record volume consumed rather than volume served
- Additional ‘meal’ category *during the day*
- Clear instructions on estimating/measuring volume
- Training for instructors and participants
- *Significant scientific gap in nutrition*
Publication of results

• Publication and dissemination of methodologies and validation studies
• Preferably in peer-reviewed journals

• Currently 3 published in journals, 1 book
Standardisation of liquid food recording

- Soups to be treated as composite food
- Recipe (homemade), brand name (ready to use)
- Quantity consumed should be recorded

- If not possible
  - FoodEx2 categories for soup should be used
Water content of food

- Recorded dietary data should be analysed for water content
- Use of food composition software that includes information on the water content of foods
  - Ideally linked to a standard categorisation system e.g. EFSA’s FoodEx2
- Overall percentage of water from foods reported
- More accurate estimate to be incorporated in future EU recommendations
Standardisation of diluted drink recording

- Consistency in recording is needed for diluted drinks intakes
- Volume or weight concentrate, the volume of water for each drink and the volume drank (i.e. excluding waste) recorded
- If such data is not recorded
  - Use existing/develop new standard dilution tables e.g. UK tables
Categorisation and definition of beverages

- Data on type & brand of beverage consumed, e.g. sugar-sweetened or artificially sweetened beverages
- Need to develop clear & consistent definitions of each category
- Use of EFSA’s FoodEx2 categories & descriptors is recommended
  - Facilitate more accurate estimation of energy & nutrient intakes
  - Enable comparison between countries
What now?

• Start European wide debate
• Recommendations ratified and adopted
• Encourage validation of methodologies for water & beverages

• Biomarkers for hydration
  • Ethical permission
Why do we need robust data?

- Facilitate comparisons between countries
- Establish health risks/benefits links with water, beverage types
- Dose responses
- Inform future recommendations
- Facilitate the development and monitoring of public health policies
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