WEB-BASED TOOL ON CURRENT MICRONUTRIENT RECOMMENDATIONS: IMPORTANCE AND USE

Mirjana Gurinović, Adriënne Cavelaars, Agnes Kadvan, Marija Glibetić, Esme L. Doets, Romana Novaković, Rosalie Dhonukshe-Rutten, Pieter van’t Veer, Lisette de Groot

TREĆI KONGRES O DIJETETSKIM SUPLEMENTIMA
EURRECA
EUReoan RECommendations Aligned
Harmonising micronutrient recommendations across Europe with special focus on vulnerable groups and consumer understanding

A Network of Excellence
EC-funded FP6 (2007-2011)

34 Partners, 17 Countries
Overview of recommendations for:
37 European countries, organisations +
   USA/Canada, Mexico, Brazil, Japan, China, South-Korea, South East Asia and Australia/New-Zealand
Vitamin A, C, D, E, Thiamin, Riboflavin, Niacin, Pyridoxine,
   Cobalamin, Folic acid, Sodium, Potassium, Calcium, Magnesium, Iron, Zinc, Copper,
   Phosphorus, Selenium, Iodine

Collate – Compare - Critically Review
Purpose

1. The main objective was to collect and develop a common data base/data source -user-friendly tool, **Nutri-RecQuest** with all recommendations in Europe in order to make them available to different users.

2. The main functions needed to be harmonized and developed in one simple nutritional tool are: monitoring and assessment of dietary intake, assessment of micronutrient inadequacies, and comparison of recommendations for different populations. These all functions are very important to be used in micronutrient supplement development.

3. To develop a common data base/data source to be used in the other nutritional software tools (e.g. for menu planning)
Current micronutrient recommendations for:
- 37 European & 8 non-European countries/organizations/regions
- 29 Micronutrients
In total, over 20,000 recommendations concerning micronutrients

The following measures and concepts are included:

1. Recommended intake levels:
   - *Individual Nutrient Levels (INL97.5)* also known as *Recommended Daily Allowances, Population Reference Intakes and Reference Intakes,*
   - *Adequate Intakes (AIs)* also known as *Acceptable Intake and Safe Intake,*
   - *Adequate ranges also known as Acceptable Range and Safe intake range*

2. Average Nutrient Requirements (ANRs)*

3. Upper limits (ULs).*

* For selection of countries/organisations only: i.e. USA, Canada, the Netherlands, Nordics, Dach, EC, WHO/FAO, France, UK;
Database fields

The following information about the micronutrient recommendations is available:

✓ **Country** (/Region/Organization)
✓ **Region** (Asia, Australia, Europe, North America, South America, World)
✓ **Reference**: author, title, year of publication, year of setting, web link for reference
✓ **Body responsible for setting recommendations**
✓ **Source of origin** (own report, shared reported, adopted values)
✓ **Age group** (lower age limit, upper age limit, age description)
✓ **Population group** (infants, children, adolescent, adults, elderly, pregnancy, lactation)
✓ **Gender**
✓ **Micronutrient**
✓ **Micronutrient unit** (e.g. mg, μg)
✓ **Value micronutrient recommendation** (value, or range)
✓ **Additional value** (for pregnancy and lactation)
✓ **Special condition** (free text: field containing assumptions regarding bioavailability, trimester pregnancy, activity level, etc mentioned by the authors when multiple values are set for one population group)
✓ **Condition** (fixed categories retrieved from free text field Special condition: e.g. bioavailability, physical activity, feeding, life stage, sunlight exposure)
Database fields

✓ **Type of recommendation** (e.g. recommended intake level, average nutrient requirement, upper limit of safe intake)

✓ **Type of Measure, concept** (e.g. Population Reference Intake, Safe intake range)

✓ **Standardized concepts** (as terminology varies between countries, the countries/organizations own terminology was included as well as the standardized terminology proposed by King and colleagues: i.e. the propose to use the term 'INLx' rather than the 'RDA'. Choose Info from the menu for more background information on this topic.

✓ **Health indicator used**: for selection of reports and micronutrients only (e.g. infants/calcium: the average intake from breast milk; adults/calcium: max retention; based on bone mass and fracture incidence)

✓ **Type of evidence** (i.e. balance studies, randomized controlled trials etc. This data field is meant for future use. This is indicated by “-”.

✓ **Remark** (additional information given by authors that do not fit into the above mentioned variables).

The web based tool shows the latest entered recommendations of a country/organization, in database old recommendations are archived.
Web application with underlying Standard Query Language (SQL) database

Functionality: Search & Compare; Display & Print & Export

Before use read help and info!
Search Functionality

1. **Simple search**
   Allows users to select recommendations on the bases of **1 criteria**, i.e. body responsible, (special) condition i.e. bioavailability, country, gender, micronutrient, population group, reference year, region and type of recommendation

2. **Advanced search**
   Allows users to use **multiple criteria** and includes additional search criteria such as year of setting, age limits
Example 1 -
Advanced search, Calcium, United States / Canada, recommended intake values, all population groups
Example 1 – Advanced search criteria recommended intake values, calcium, United States/Canada, all population groups
**Example – details and reference –**

**Calcium, United states, Males 14-18 year**

<table>
<thead>
<tr>
<th>ID</th>
<th>Country</th>
<th>Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>0000014557</td>
<td>United States / Canada</td>
<td>North America</td>
</tr>
</tbody>
</table>

**Reference**

Otten JJ, Hellwieg JP, and Meyers LD: Institute of Medicine (IOM) of the National Academies

**Year of setting**

1997

**Micronutrient**

Calcium

**Age**

14-18y  Age lower: 14.00 year  -  Age upper: 18.00 year

**Gender**

Male

**Nutrient lower**

<table>
<thead>
<tr>
<th>Nutrient lower</th>
<th>Nutrient upper</th>
<th>Additional amount</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1300</td>
<td></td>
<td>0.000000</td>
<td>mg</td>
</tr>
</tbody>
</table>

**Type of recommendation**

Recommended Intake level

**Type of measure / concept**

Adequate Intake (AI)

**Standardized type of measure / concept**

AI

**Health indicator**

Factorial approach, calcium retention to meet peak bone mineral accretion, and clinical trials in which bone mineral content was measured in response to variable calcium intakes—provide

**Reference ID**

<table>
<thead>
<tr>
<th>Reference ID</th>
<th>Reference Year</th>
<th>Year of setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>79</td>
<td>2001</td>
<td>1997</td>
</tr>
</tbody>
</table>

**Reference Author**

Otten JJ, Hellwieg JP, and Meyers LD: Institute of Medicine (IOM) of the National Academies

**Reference Title**


**Reference Link**

http://www.iom.edu/CMR/3708.aspx

**Body Responsible**

Institute of Medicine of the National Academies, Food and Nutrition Board, USA

**Source of Origin**

Own/Shared
**Example 2 - Advanced search**

**Iron**

**The Netherlands**

**Average nutrient requirement**

**Pregnant women**
### Example 2 – Result Advanced search - Iron, The Netherlands, Average nutrient requirement, Pregnant women

<table>
<thead>
<tr>
<th>Country</th>
<th>Micronutrient</th>
<th>Age (years)</th>
<th>Population group</th>
<th>Gender</th>
<th>Special condition</th>
<th>Type of recommendation</th>
<th>Value (Lower)</th>
<th>Unit</th>
<th>Additional amount recommended</th>
<th>Year of setting</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Netherlands</td>
<td>Iron</td>
<td>Pregnancy</td>
<td>Female</td>
<td></td>
<td>Third trimester</td>
<td>Average nutrient</td>
<td>18</td>
<td>mg</td>
<td>More</td>
<td>1989</td>
<td>Details</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Iron</td>
<td>Pregnancy</td>
<td>Female</td>
<td></td>
<td>Second trimester</td>
<td>Average nutrient</td>
<td>14</td>
<td>mg</td>
<td>More</td>
<td>1989</td>
<td>Details</td>
</tr>
<tr>
<td>Netherlands</td>
<td>Iron</td>
<td>Pregnancy</td>
<td>Female</td>
<td></td>
<td>First trimester</td>
<td>Average nutrient</td>
<td>9</td>
<td>mg</td>
<td>More</td>
<td>1989</td>
<td>Details</td>
</tr>
</tbody>
</table>

* This column shows the recommended intake value or the average requirement. In case a range is indicated, it shows the lower value of the range.
Compare functionality

- Allows users to compare recommended intake values or average nutrient requirements of micronutrients among countries or reports
- For males or females for specific ages or for pregnant or lactating women
- Using assumption in case of ranges, multiple values for 1 population group (e.g. for different activity levels), recommendations formulated as additional amounts
Example 3 - Compare - Average nutrient requirement
Calcium for different ages for men among all countries

<table>
<thead>
<tr>
<th>MICRONUTRIENT:</th>
<th>TYPE OF RECOMMENDATION:</th>
<th>AGES:</th>
<th>GENDER:</th>
</tr>
</thead>
<tbody>
<tr>
<td>calcium</td>
<td>Average nutrient requirement</td>
<td>2 m</td>
<td>Male</td>
</tr>
<tr>
<td></td>
<td>Recommended intake level</td>
<td>5 y</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 y</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 y</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>40 y</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>65 y</td>
<td></td>
</tr>
<tr>
<td>chlorine</td>
<td></td>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>choline</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

POPULATION GROUP:
Pregnant women
Lactating women

COMPARE BY: Country
REGION: All
DISPLAY
RESET SELECTION
Example 3 – Result Compare – Average nutrient requirement
Calcium for different ages for men among all countries

<table>
<thead>
<tr>
<th>Micronutrient: Calcium [mg], Gender: Male, Region: All, Type of recommendation: ANR</th>
<th>Population group [Year]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.17</td>
</tr>
<tr>
<td>Australia/New Zealand</td>
<td></td>
</tr>
<tr>
<td>European Community</td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>95</td>
</tr>
<tr>
<td>Netherlands</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>400</td>
</tr>
<tr>
<td>World Health Organization/Food and Agriculture Organization</td>
<td></td>
</tr>
<tr>
<td>P25</td>
<td>270</td>
</tr>
<tr>
<td>Median</td>
<td>270</td>
</tr>
<tr>
<td>P75</td>
<td>400</td>
</tr>
<tr>
<td>Ratio (max/min)</td>
<td>4.21</td>
</tr>
<tr>
<td>Range (max-min)</td>
<td>305</td>
</tr>
</tbody>
</table>
Example 4 – Compare – Recommended intake
Folate for pregnant women among European countries
Example 4 - Compare - Recommended intake
Folate for pregnant women among European countries

<table>
<thead>
<tr>
<th>Micronutrient: FOLATE (µg)</th>
<th>Population group</th>
<th>Pregnant women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Austria</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Belgium</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Bosnia and Herzegovina (party: Federation of Bosnia and Herzegovina)</td>
<td>290</td>
<td></td>
</tr>
<tr>
<td>Bosnia and Herzegovina, east, Republica Srpska</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Bulgaria</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Croatia</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>European Community</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Finland</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>France</td>
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<td></td>
</tr>
<tr>
<td>Germany</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Hungary</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Iceland</td>
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<tr>
<td>Italy</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Latvia</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Lithuania</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Macedonia, The Former Yugoslav Republic of</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Montenegro</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Netherlands</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Norway</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Poland</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Portugal</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Russian Federation</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Slovakia</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Slovenia</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Sweden</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>World Health Organization/Food and Agriculture Organization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PNC</td>
<td>&lt;00</td>
<td></td>
</tr>
<tr>
<td>OECD</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>Preliminary</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>Range (maximum)</td>
<td>310</td>
<td></td>
</tr>
</tbody>
</table>
Application in supplements and food industry

### Supplement Facts

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Amt Per Serving</th>
<th>Units</th>
<th>%Daily Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A (29% as BetaCarotene)</td>
<td>3,500</td>
<td>IU</td>
<td>70</td>
</tr>
<tr>
<td>Vitamin C</td>
<td>75</td>
<td>mg</td>
<td>125</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>800</td>
<td>IU</td>
<td>200</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>35</td>
<td>IU</td>
<td>117</td>
</tr>
<tr>
<td>Vitamin K</td>
<td>50</td>
<td>mcg</td>
<td>63</td>
</tr>
<tr>
<td>Thiamin</td>
<td>1.1</td>
<td>mg</td>
<td>73</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>1.1</td>
<td>mg</td>
<td>65</td>
</tr>
<tr>
<td>Niacin</td>
<td>14</td>
<td>mg</td>
<td>70</td>
</tr>
<tr>
<td>Vitamin B6</td>
<td>2</td>
<td>mg</td>
<td>100</td>
</tr>
<tr>
<td>Folic Acid</td>
<td>400</td>
<td>mcg</td>
<td>100</td>
</tr>
<tr>
<td>Vitamin B12</td>
<td>6</td>
<td>mcg</td>
<td>100</td>
</tr>
<tr>
<td>Biotin</td>
<td>40</td>
<td>mcg</td>
<td>13</td>
</tr>
<tr>
<td>Pantothenic Acid</td>
<td>15</td>
<td>mg</td>
<td>150</td>
</tr>
<tr>
<td>Calcium</td>
<td>500</td>
<td>mg</td>
<td>50</td>
</tr>
<tr>
<td>Iron</td>
<td>18</td>
<td>mg</td>
<td>100</td>
</tr>
<tr>
<td>Phosphorus</td>
<td>20</td>
<td>mg</td>
<td>2</td>
</tr>
<tr>
<td>Iodine</td>
<td>150</td>
<td>mcg</td>
<td>100</td>
</tr>
<tr>
<td>Magnesium</td>
<td>100</td>
<td>mg</td>
<td>25</td>
</tr>
<tr>
<td>Zinc</td>
<td>8</td>
<td>mg</td>
<td>53</td>
</tr>
<tr>
<td>Selenium</td>
<td>55</td>
<td>mcg</td>
<td>79</td>
</tr>
<tr>
<td>Copper</td>
<td>0.9</td>
<td>mg</td>
<td>45</td>
</tr>
<tr>
<td>Manganese</td>
<td>1.8</td>
<td>mg</td>
<td>90</td>
</tr>
<tr>
<td>Chromium</td>
<td>25</td>
<td>mcg</td>
<td>21</td>
</tr>
<tr>
<td>Molybdenum</td>
<td>50</td>
<td>mcg</td>
<td>67</td>
</tr>
<tr>
<td>Chloride</td>
<td>72</td>
<td>mg</td>
<td>2</td>
</tr>
<tr>
<td>Potassium</td>
<td>80</td>
<td>mg</td>
<td>2</td>
</tr>
<tr>
<td>Boron</td>
<td>150</td>
<td>mcg</td>
<td>*</td>
</tr>
<tr>
<td>Nickel</td>
<td>5</td>
<td>mcg</td>
<td>*</td>
</tr>
<tr>
<td>Silicon</td>
<td>2</td>
<td>mg</td>
<td>*</td>
</tr>
<tr>
<td>Tin</td>
<td>10</td>
<td>mcg</td>
<td>*</td>
</tr>
<tr>
<td>Vanadium</td>
<td>10</td>
<td>mcg</td>
<td>*</td>
</tr>
</tbody>
</table>

Percent Daily Values are based on a 2,000 calorie diet.
* Daily Value not established.

### Nutrition Facts

<table>
<thead>
<tr>
<th>Serving Size: 1 cup (228g)</th>
<th>Servings Per Container: 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories: 250</td>
<td>Calories from Fat: 110</td>
</tr>
<tr>
<td>% Daily Value</td>
<td></td>
</tr>
<tr>
<td>Total Fat: 12g</td>
<td></td>
</tr>
<tr>
<td>Saturated Fat: 3g</td>
<td></td>
</tr>
<tr>
<td>Trans Fat: 1.5g</td>
<td></td>
</tr>
<tr>
<td>Cholesterol: 30mg</td>
<td></td>
</tr>
<tr>
<td>Sodium: 470mg</td>
<td></td>
</tr>
<tr>
<td>Total Carbohydrate: 31g</td>
<td></td>
</tr>
<tr>
<td>Dietary Fiber: 0g</td>
<td></td>
</tr>
<tr>
<td>Sugars: 5g</td>
<td></td>
</tr>
<tr>
<td>Protein: 5g</td>
<td></td>
</tr>
<tr>
<td>Vitamin A: 4%</td>
<td></td>
</tr>
<tr>
<td>Vitamin C: 2%</td>
<td></td>
</tr>
<tr>
<td>Calcium: 20%</td>
<td></td>
</tr>
<tr>
<td>Iron: 4%</td>
<td></td>
</tr>
</tbody>
</table>

* Percent Daily Values are based on a 2,000 calorie diet.
  Your Daily Values may be higher or lower depending on your calorie needs:

- Calories: 2,000
- Calories from Fat: 2,500
- Total Fat: Less than 65g
- Saturated Fat: Less than 20g
- Trans Fat: Less than 2g
- Cholesterol: Less than 300mg
- Sodium: Less than 2,400mg
- Total Carbohydrate: 300g
- Dietary Fiber: 25g
- Sugars: 375g
- Protein: 5g
Application in nutritional software tools - Nutplan

- NUTRITIVE VALUES
- NUTRIENT RECOMMENDATIONS
- NUTRIENT ADEQUACY ASSESSMENT
- ENERGY NEEDS
- NUTRIENT INTAKE ASSESSMENT
- DIET MODELING
- FOOD LABELING (SME)
- NUTRITIONAL STATUS ASSESSMENT

Foods with nutritive values

Nutrient Recommendations

FCDB

EURRECA Nutrient Recommendation Database

NutriRequest
Conclusion

**Nutri-RecQuest** offers valuable and comprehensive data on micronutrient recommendations from European and key non-European countries for bodies responsible for setting recommendations as well as for users of recommendations including scientists, policy makers, health professionals and dietary supplements and food industry.

WHO Europe will use in future!

Freely available!

Access via [www.eurreca.org](http://www.eurreca.org), [www.serbianfood.info/eurreca](http://www.serbianfood.info/eurreca)

**Mirjana Gurinovic** e-mail: mirjana.gurinovic@gmail.com

**CENM**: [www.srbnutrition.info](http://www.srbnutrition.info)
Backup slides
Background

Most countries in Europe have established their own nutrient recommendations. As yet there is no standard approach for deriving nutrient recommendations; they vary from country to country.

The EURRECA (EURopean micronutrient RECommendations Aligned) Network of Excellence (www.eurreca.org) collated data on current micronutrient recommendations [Doets et al., 2008; de Wit et al. 2008; Doets et al., 2009].

Critically reviewing these recommendations revealed considerable variations between countries [Doets et al., 2008; Doets et al., 2009].
Database fields

The following information about the micronutrient recommendations is available:

✓ **Country:** Austria
✓ **Region:** Europe
✓ **Reference:**
  - **author** Austrian Nutrition Society (OGE),
  - **title** Austrian Nutrition Society (OGE),,. Referenzwerte für die Nahrstoffzufuhr/Reference Values for Nutrient Intake, 1st edition,
  - **year of publication** 2005,
  - **year of setting** 2006, (web link for reference)-
✓ **Body responsible for setting recommendations:** Austrian Nutrition Society (OGE),
✓ **Source of origin:** Shared/Adopted
✓ **Age group** (Pregnancy  Age lower: 0.00 year - Age upper: 999.00 year)
✓ **Population group** (adults)
Database fields

- **Gender**: Female
- **Micronutrient**: Fluoride
- **Micronutrient unit**: mg
- **Value micronutrient recommendation**: 7mg
- **Additional value**: -
- **Special condition**: Pregnancy >4m
- **Condition**: -
- **Type of recommendation**: Recommended intake level
- **Type of Measure, concept**: Tolerable Upper Intake Level
- **Standardized concepts**: INL97,5
- **Health indicator used**: -
- **Type of evidence**: -
- **Remark**: Adopted from European Food Safety Authority
Eurreca Micronutrient database

Main menu

Nutri-RecQuest gives the latest micronutrient recommendations of a country or organisation.

The database is based on the following measures and concepts:

1. Recommended Intake Levels:
   - Individual Nutrient Levels (IU97) also known as Recommended Daily Allowances, Population Reference Intakes and Reference Intakes.
   - Adequate Intakes (AIs) also known as Acceptable Intake and Safe Intake.
   - Adequate ranges also known as Acceptable Range and Safe Intake range.

2. Average Micronutrient Requirements (ANRs) and

3. Upper limits (ULs).

Collected from 37 European countries and organisations and eight non-European countries/regions, the database contains information for 29 micronutrients for different population groups (infants, children, adolescents, adults, elderly, pregnant and lactating women).

For information on how to use it click on the Help option from the menu. For more information about the developers of Nutri-RecQuest, data collection and scientific background click on the Info option.

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Few European countries/organisations (8 of 37) set their OWN recommendations

<table>
<thead>
<tr>
<th>Own – international</th>
<th>EC, WHO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own – national</td>
<td>France, UK, NL, Latvia</td>
</tr>
<tr>
<td>Shared</td>
<td>DACH–countries (n=3), Nordic Countries (n=5)</td>
</tr>
<tr>
<td>Own + adopted</td>
<td>Albania, Belgium, Bulgaria, Croatia, Estonia, Hungary, Ireland, Italy, Lithuania, Montenegro, Poland, Repl. of Srpska, Serbia, Slovakia, Spain, The FYR Macedonia</td>
</tr>
<tr>
<td>Adopted</td>
<td>Federation of Bosnia and Herz., Czech Republic, Greece, Portugal, Slovenia</td>
</tr>
<tr>
<td>No info on origin</td>
<td>Romania, Russian Federation</td>
</tr>
</tbody>
</table>
## Heterogeneity in European micronutrient recommendations

<table>
<thead>
<tr>
<th>Heterogeneity in current recommendations</th>
<th>Ratio max / min ≥ 2 for all populations groups</th>
<th>Ratio max / min ≥ 2,5 for at least 1 population group &amp; ≥ 2 for 2/3 of all populations groups</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Large</strong></td>
<td>- Vitamin D, Vitamin C, Sodium, Folate, Selenium, Copper;</td>
<td>- Iron, Zinc, Phosphorus, Vitamin B12, Fluoride</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Biotin, Chromium, Molybdenum*</td>
</tr>
<tr>
<td><strong>Small</strong></td>
<td>Calcium, Magnesium, Potassium, Vitamin A, Vitamin E, Vitamin B6, Thiamin, Riboflavin, Iodine, Niacin, Vitamin K, Pantothenic acid, Manganese</td>
<td></td>
</tr>
<tr>
<td><strong>N.A</strong></td>
<td>Cholin</td>
<td></td>
</tr>
</tbody>
</table>
Many different terms are used to express recommendations all referring to the same concept.

<table>
<thead>
<tr>
<th>Terms used</th>
<th>Equivalent to</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRI = Population Reference Intake</td>
<td>Daily intake level sufficient to meet requirements of nearly all healthy individuals in a specified population</td>
</tr>
<tr>
<td>RNI = Reference Nutrient Intake</td>
<td></td>
</tr>
<tr>
<td>RI = Reference Intake</td>
<td></td>
</tr>
<tr>
<td>RI = Recommended intake</td>
<td></td>
</tr>
<tr>
<td>RDA = Recommended Dietary Allowance</td>
<td></td>
</tr>
<tr>
<td>Etc.</td>
<td></td>
</tr>
</tbody>
</table>
## Common terminology => UNU

<table>
<thead>
<tr>
<th>UNU Term</th>
<th>UNU Definition</th>
<th>Terminology used by European countries/organisations and key non-European countries for equivalent concepts</th>
</tr>
</thead>
</table>
| NIV      | Nutrient intake value encompasses the set of recommendations based on primary data | - Dietary Reference Intakes (US)  
- Reference values for nutrient intake (DACH)  
- Dietary Reference values (UK, France) |
| ANR      | The Average Nutrient Requirement is the average or median requirement estimated from a statistical distribution of requirements for a specific criterion and for a particular age- and sex-specific group. | Estimated Average Requirement |
| INLx     | The Individual Nutrient Level is the recommended nutrient level for all healthy individuals in a specific subpopulation. The \( \text{X} \) covers the needs of a certain \( \% \) of the population. | - Recommended nutrient intake (DACH, UK, WHO)  
- Population Reference intake (France, EC)  
- Recommended average (Latvia)  
- Recommended daily allowance (Netherlands, US)  
- Recommended intake (Nordics)  
= all equal to \( \text{INL}_{97.5} \) |
<table>
<thead>
<tr>
<th>UNU Term</th>
<th>UNU Definition</th>
<th>Terminology used by European countries/organisations and key non-European countries for equivalent concepts</th>
</tr>
</thead>
</table>
| AI       | The Adequate Intake is defined as the observed or experimentally derived intake by a defined population group that appears to sustain health. It is used when there are insufficient primary data to establish a statistical distribution of individual requirements and, therefore, an ANR and INLx. | - Estimated value for adequate intake (DACH)  
- Adequate Intake (France, Netherlands, EC, US)  
- Safe intake (UK)  
- Acceptable intake (WHO) |
|          | The Acceptable range is a range of safe intake values and is given where insufficient information is available. | - Acceptable range (EC)  
- Estimated value for adequate intake (DACH)  
- Adequate area of intake (Netherlands)  
- Safe intake (UK) |