

# **Reports on tasks for scientific cooperation**

**Report of experts participating in Task 3.2.11**

**March 2004**

**Assessment of the dietary exposure  
to arsenic, cadmium, lead and mercury  
of the population of the EU Member States**

Directorate-General Health and Consumer Protection

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## **1. FOREWORD**

According to Council Directive 93/5/EEC "on the assistance to the Commission and cooperation by the Member States in the scientific examination of questions relating to food" Member States of the European Union can cooperate on problems facing the Commission in the area of food. Directive 93/5/EEC also indicates that an inventory of Tasks to be undertaken has to be published as a Commission Decision at least every six months. For each Task, the participating Member States, the Member State which provides coordination and time limit for completion will be indicated. The rationale for each Task is to provide harmonised and reliable information to be used by the Commission for the management of problems related to food. With this aim the Competent Authorities responsible for Scientific Cooperation in the Member States nominate experts in the specific field of interest that will provide the Coordinator with the information necessary to prepare a final report. In principle the final report should contain factual information, but it should be underlined that gathering and presenting scientific data, especially deriving from sources of different origin, can require a degree of interpretation by experts and by the Coordinators. It is therefore important to stress that the interpretation and views in the present report are not necessarily those of the participating Member States or those of the European Commission.

## 1.1 Summary

Data on occurrence, consumption and intake calculations for the mean adult population were submitted by BE, DK, FI, FR, DE, HE, IR, IT, NL, NO, PT, SE and UK. Several factors have an impact on the validity of the intake estimation. The most important is probably the limited amount of occurrence data, which in many countries left several food groups empty. DK and UK had sufficient data for a complete intake assessment. Other confounding factors are differences in analytical quality and different choices of age groups for the intake estimations. The results therefore have to be viewed with caution.

The occurrence levels of Cd, Pb and Hg in foodstuffs, for which maximum limits (ML) have been established in Commission Regulation 466/2001, are generally well below the MLs.

**Arsenic.** Nine Member States submitted occurrence and intake data for arsenic in fish, the main source of arsenic in the food, for the mean adult population. Very few data was provided on arsenic in other foodstuffs. An accurate estimation of the total intake is therefore not possible in most Member States. The results from DK and the UK, which cover all major food groups, indicate that fish and other seafood contribute more than 50% of the dietary arsenic. The mean daily intake of arsenic from fish and other seafood is below 0.35 mg. It is thus assumed that the total daily intake of arsenic by the mean adult population is below 1 mg. Consumers of fish and seafood may reach an intake of 1 mg/day from these foods alone.

Data from FR and DE indicate that children have a lower intake of arsenic than adults. The burden/kg bodyweight of children may, however, be larger than for adults due to their lower bodyweight.

The type of water in which the fish is caught, i.e. marine or fresh, is of major importance for the As-content, with the highest levels in marine species. No data was available on the inorganic arsenic-species, which are the most toxic species present in food. The ratio inorganic/total As in foodstuffs is thus largely unknown.

**Cadmium.** Thirteen Member States submitted occurrence and intake data for the mean adult population. DK, FI, FR, DE and the UK had the best data to make an accurate intake estimation. IR had data for only two food categories. The mean intake in the Member States is less than 30% of the PTWI, with the exception of the Netherlands with 38%. The PTWI is 0.49 mg for a person weighing 70 kg. In the UK the intake by mean consumers is 22% of the PTWI, whereas for high consumers is 37% of the PTWI. Cereals and vegetables are the main sources of cadmium in the diet, representing approximately 2/3 of the mean cadmium intake.

Data from FR and DE indicate that children have a lower intake of cadmium than adults. However, children have a larger burden/kg body weight, due to their lower body weight. The cadmium dietary intake of children 4-6 years old is estimated to 65% of the PTWI.

**Lead.** Twelve Member States submitted occurrence and intake data for the mean adult population. Only DK and the UK had sufficient data to make a complete intake estimation. All other Member States were lacking data from one or several food groups. The results indicate,

however, that in 11 Member States the average intake of lead via food by is less than 25% of the PTWI, which is 0.025 mg/kg bodyweight/week (equal to 1.75 mg for a person weighing 70 kg). In PT the intake was in the order of 50% of the PTWI. This high intake is due to certain food groups which were reported to contain unusually high lead levels. In PT these foods, e.g. potatoes, were analysed with methods with extremely high detection limits ( $\leq 1$  mg/kg). Since half of that limit is used as the occurrence level for the intake calculation, intake may erroneously appear to be very high. In e.g. IR the intake is underestimated (0.4% of the PTWI) since occurrence data were available only from a few food items.

The mean intake in the Member States is 14% of the PTWI. In the UK the intake by the mean population is 11% of the PTWI, whereas the intake by mean consumers is 24% and for high level consumers 43% .

Specific foodstuffs from some Member States were reported to contain very high lead levels (wine, game, fish and meat). If these high occurrence levels are confirmed, or the sampling found to be representative, consumers in these Member States may be at risk of exceeding the PTWI.

Data from FR and DE indicate that children have a lower intake of lead than adults. However, children have a larger burden/kg body weight, due to their lower body weight, and may reach 35 % of the PTWI.

**Mercury.** Thirteen Member States submitted occurrence and intake data for fish. DK, DE and the UK had the best data to make an accurate intake estimation. FI, IT and SE had data for only one food category. Fish is the main source of mercury in the food, for the mean adult population. In fish and shellfish, mercury is present mainly in the form of methylmercury, while its almost entirely inorganic mercury in other foodstuffs. Fruits and vegetables are the main source of mercury in FR, NL and DE. In FR and DE mushrooms is included in this category, which strongly affects the intake level. Dried fruit and vegetables also has an enhancing effect on the intake in DE.

The mean intake for the Member States is less than 30% of the PTWI for total mercury, corresponding to 0.35 mg for a person weighing 70 kg. In the UK the intake by mean consumers is 6% of the PTWI, whereas for high consumers is 13% of the PTWI.

The current PTWI (established 2003) for methylmercury is 1.6  $\mu$ g/kg bodyweight, which corresponds to 0.112 mg/week for a person weighing 70 kg. Data were reported for total mercury, but as an overestimate assuming this was all methylmercury, the mean intake of methylmercury from fish and shellfish in the Member States would be less than 30% of the PTWI for methylmercury. In the UK the methylmercury intake by mean consumers would be 13% of the PTWI, whereas for high consumers it would be 41% of the PTWI for methylmercury. In NO the methylmercury intake by mean consumers would correspond to 78% of the PTWI for methylmercury, whereas for high consumers, the PTWI for methylmercury would be exceeded.

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Data from FR and DE indicate that children have a lower intake of mercury than adults. However, children have a larger burden/kg body weight due to their lower body weight. Depending upon the proportions of methylmercury present in the foods tested for total mercury, it is possible that the intake could exceed the PTWI for methylmercury .

The results from the SCOOP task indicate that there is a risk that population-groups with a high consumption of fish and seafood may have intakes of methylmercury that are close or even exceed the PTWI for methylmercury of 1.6  $\mu\text{g}/\text{kg}$  body weight/week. More information is needed on the relative proportions of methylmercury to total mercury in different foods.

## 1.2 Introduction

The project, Scientific Co-operation (SCOOP) Task 3.2.11: Assessment of the dietary exposure to arsenic, cadmium, lead and mercury of the population of the EU Member States, was decided in October 2001 and commenced in January 2002. The objective of the task is to provide the scientific basis for the evaluation and management of risk to public health arising from dietary exposure to arsenic, cadmium, lead and mercury. This requires the identification of the major dietary sources of these elements and the estimation of the intakes by both the whole population and by any high-risk subgroups for each Member State.

The Joint FAO/WHO Expert Committee on Food Additives (JEFCA) has established Provisional Tolerable Weekly Intakes (PTWI) for cadmium, lead, mercury and methylmercury. These may be compared with the intake estimates obtained from the different Member States. The outcome of these comparisons is an indication of the risk for hazardous exposure run by the citizens in the Member States.

The EU Scientific Committee for Food reports in its Opinion on Cadmium (thirty-sixth series. 1997) great concerns regarding its limited ability to assess the dietary exposure, due to lack of reliable consumption data. It concludes, however, that a significant part of the population has an intake of cadmium, from dietary sources alone, that is close to the PTWI. For lead the Committee concludes (Opinion on Lead, thirty-second series. 1994) that the level of contamination of foodstuffs does not seem to be a cause for alarm. It does, however, note that the reasons for extremely high levels, which are occasionally found in foodstuffs, need to be identified. Long term action should follow with the objective of further lowering the lead levels in foodstuffs.

In the context of the Scientific Co-operation the Commission of the Member States proposed a specific task on lead, cadmium, mercury and arsenic. Italy and Sweden accepted a joint Co-ordinatorship and were assigned the task by a Commission Decision of 26/10/2001.

### Member States contributing to the scoop project

BELGIUM	BE
DENMARK	DK
FINLAND	FI
FRANCE	FR
GERMANY	DE
GREECE	HE
IRELAND	IR
ITALY	IT
THE NETHERLANDS	NL
NORWAY*	NO
PORTUGAL	PT
SWEDEN	SE
<u>UNITED KINGDOM</u>	<u>UK</u>

\*Norway is not distinguished from Member States in this report.



Intake data was primarily submitted for the mean adult population in the Member States. Some Member States submitted data also for certain other population and age groups. See Table 1.1. for details.

**Table 1.1. Arsenic, cadmium, lead and mercury. Intake data reported for different population and consumer groups in the Member States**

Population	BE	DK	FI	FR	DE	HE	IR	IT	NL*	NO	PT	SE	UK
Adult. Mean		X	X	X	X	X	X	X	X	X	X	X	X
Adult. High Level				X	X	X	X			X	X		
Children (4-6 years). Mean.					X								
Children (4-6 years). High level.					X								
Children (10-12 years). Mean.					X								
Children (10-12 years). High level.					X								
Children (3-14 years). Mean				X									
Children (3-14 years). High level				X									
Children (14-18 years). Mean	X												
Children (14-18 years). High level	X												
<b>Consumers</b>													
Adult. Mean				X	X	X	X			X			X
Adult. High Level				X	X	X	X			X			X
Children (3-14 years). Mean.				X									
Children (3-14 years). High level.				X									
Children (4-6 years). Mean.					X								
Children (4-6 years). High level.					X								
Children (10-12 years). Mean.					X								
Children (10-12 years). High level.					X								
Children (14-18 years). Mean.	X												
Children (14-18 years). High level.	X												

\*For cadmium and mercury only.

Spain declined further participation at an early stage of the project. Austria did not submit data. The Netherlands decided not to submit occurrence data for arsenic and lead.

Institutes in the Member States provided the latest national information in accordance with the agreed format. The information to be collated was primarily concerned with:

- The concentration of arsenic, cadmium, lead and mercury in foodstuffs.
- Food consumption data at the national levels.
- Dietary intake of the elements at Member State level.

### 1.3 Legislation

#### Maximum levels

The Commission Regulation (EC) No 466/2001 adopted in March 2001, established maximum levels (MLs) of cadmium and lead in certain foodstuffs and mercury in fish products. The regulation is in force since 5 April 2002. The Commission Regulation (EC) No 221/2002 of February 2002 amended maximum levels of cadmium, lead and mercury in certain fishery products. A revaluation of the MLs will begin in 2003. For arsenic no ML is yet established.

### **Compliance with MLs for cadmium, lead and mercury in the Member States**

A comparison with the MLs for cadmium, lead and mercury will be made for foodstuffs for which MLs are established. The results will be found in sections 3.5, 4.5 and 5.5, respectively. When data in tables 3.6, 4.6 and 5.6 differ from those in other occurrence data tables it may be due to differences in reporting by the Member States, or by the interpretation by the coordinators.

### **Criteria for sampling, sample treatment and methods of analysis**

The Commission Decision 90/515/EEC laid down the reference methods for detecting residues of cadmium, lead and arsenic. Subsequently, the Commission Directive 2001/22/EC of 8 March 2001 laid down criteria for the sampling methods and the requirement to be met in sample treatment and analysis of cadmium, lead, and mercury for the official control of their levels in foodstuffs. Several established analytical methods are available which comply with these requirements.

## **1.4 Estimation of food consumption**

There are various types of data describing food consumption. Household budget surveys generally cover amounts of foods brought into the household and refer to the food as purchased, i.e. no information on preparation methods and actually consumed amounts. In individual dietary surveys different methods are used covering short periods or more long-term intake. Here the aim is to cover the actual amounts consumed.

Food consumption data derived from various studies were used to calculate the intake of mineral elements. Several Member States had access to national representative surveys, whereas others had more limited studies at their disposal. These data were combined with occurrence data, e.g., consumption of 0.25 kg of a foodstuff containing 0.100 mg As/kg represents an intake of 0.025 mg As. Only food consumption data for which occurrence data exist were used. Analytical data should according to agreement be validated and up to date. In certain cases older data could be used, provided their quality could be verified.

## **1.5 Dietary intake of elements**

The consumption of food within the various food groups, for which there are occurrence data available, varies considerably between the Member States and regions, as can be seen in Tables 2.1, 3.1, 4.1 and 5.1. These differences must, however, be viewed with caution since the number of specific food items in each food group can vary considerably between countries. For example, Greece has occurrence data only for dried and preserved fruit in the food group “Fruit and vegetables”, Sweden has occurrence data only for table wine in the food group “Beverages”. The consumption of milk in Germany appear to be only a fraction of what is consumed in the other Member States, but is based only on the consumption of dry milk. Information on the UK food groups can be found in the UK’s consumption and intake section in *Annex A*.

Provisional Tolerable Weekly Intakes (PTWIs) has been established for cadmium, lead and mercury. They are based on per kg bodyweight, but, for simplicity, often given for a person weighing 70 kg. To facilitate a more precise calculation the mean body weight of adults in the participating Member States are shown in table 1.2. It should be noted that the mean weight is different between males and females and that the age brackets may vary between Member States.

**Table 1.2. Age brackets applied in the different Member States and the mean body weight of Member State subjects, in kg. Data from national surveys.**

Member State	Age (years)	Male (kg)	Female (kg)	Mean M/F (kg)
Belgium	14-18	60.7	59.1	60
Denmark	15-80			72
Finland	25-64	84.3	69.9	77.1
France	3-14	31.26	31.96	31.6
France	15+	73.88	60.11	66.4
France. Total population	3-15+	55.09	49.46	52.18
Germany	10-14			41
Germany	18+			70.5
Greece				70
Ireland				75
Italy				70
The Netherlands	1-97			65.8
Norway	16-79/18-79			73
Portugal				
Sweden		80.8	66.6	73.7
United Kingdom				70.1

The Member States may have national standards for intake estimations, based on criteria different from those used in this report. It may be noted that e.g. the UK does not use population estimates for comparison with safety guidelines, but merely to look at exposure trends over time. Total consumer estimates is used instead of comparison with the PTWI. The compilations used in this report are primarily made to facilitate comparison between Member States.

It must be observed that occurrence and intake data are reported using different units throughout this report - mg and µg.

## 1.6 Evaluation of the results

The occurrence data submitted by the participants were checked by the co-ordinators. In cases where analytical data showed signs of being unusual, or otherwise deviating from what is normally found in reports, they were discussed with the participant and in many cases verified. In some cases data were withdrawn.

Most of the participants had reported information from their analytical quality control (AQC) programmes, i.e. results from the analysis of certified reference materials (CRMs) and from participation in proficiency testing (PT) programmes. These results were used to validate the occurrence data. All AQC-data are found in *Annex A*.

The participants also submitted information on the methods of analysis. A large array of methods was used. Samples were mostly wet digested using mineral acids, either in closed vessels under pressure or open vessels at atmospheric pressure. Dry ashing was also utilised by some laboratories. The four elements were mostly determined by atomic absorption spectrometry (AAS), generally using graphite furnace techniques for Cd and Pb and vapour generation techniques for As and Hg. Many, but not all, laboratories reported the use of background correction during the analysis. Inductively coupled plasma – mass spectrometry (ICP-MS) was used by some laboratories. In PT certain foods, e.g. potatoes, were analysed with methods having extremely high detection limits ( $\leq 1$  mg/kg). Since half of that limit is used as the occurrence level for the intake calculation, intake may erroneously appear to be very high. All method descriptions are found in *Annex A*.

The information submitted to the co-ordinators is in most cases freely accessible via reports or international publications. The references to available reports are found in *Annex A*. Information on occurrence, consumption and intake data for arsenic, cadmium, lead and mercury, as submitted by the Member States is found in *Annex B*.

## 1.7 Limiting factors

During the course of the project several factors were identified that will affect the interpretation of the result of the SCOOP-project. The most important factors are listed below.

### **Missing data.**

During the collection of occurrence data for the various foodstuffs it became clear that the Member States has no common approach for the acquisition of necessary analytical data. DK and the UK had sufficient occurrence data for a full intake study, whereas all other Member States were lacking data for some, or most, food groups.

### **Skewed food groups.**

When food groups only contain a single, or a few, food items the intake calculation can be severely distorted by a food item with an unusually high/low level of the analyte and being consumed in small/large quantities.

### **Quality of submitted data.**

In many cases unusually high (in some cases unusually low) occurrence data were not verified by submitted AQC-data. Unreliable occurrence data can result in both over- and underestimation of the intake of toxic elements.

**Limit of detection.**

For the purpose of intake calculations it was generally agreed to assign results below the LOD half of that value (e.g.  $<0.05 = 0.025$ ). Some Member States, however, used other interpretations. In the UK, available data are calculated as equal to the LOD (e.g.  $<0.05 = 0.05$ ). Denmark uses the the mean value of the actually measured individual determinations below the LOD. As a result some intake calculations may be under- or over-estimated. It also adds to the general uncertainty of the intake estimates.

**Estimation of consumption.**

The comparability of the exposure data is hampered by several factors, e.g. type of food consumption data, representativity of population studied, period of collection of analytical data and missing data. The method used for measuring food consumption influences the quality and reliability of data and also affects the interpretation of intake estimations. In many instances food consumption is underestimated, when methods such as dietary records, 24 h recall and fixed food frequency questionnaires are used.

## 1.8 Conclusions from SCOOP task 3.2.11

**Arsenic.** Fish and other seafood is the main source of As in the diet of the mean adult population. The daily intake from fish and other seafood is estimated to be below 0.35 mg ( $<2.5$  mg/week). Marine species of fish may have As-levels more than ten times higher than that in fish from e.g. brackish water. Fish and other seafood contribute more than 50% to the mean intake. Consumers of fish and other seafood may reach an intake of 1 mg/day (7mg/week), or more. No data on the level of inorganic As in fish and other food is presently available.

Children have a lower intake than adults, according to data from FR and DE, and young children (4-6 years) have the lowest intake. Since children have lower body weights, their body burden/kg may, however, be higher than that of adults.

**Cadmium.** None of the most consumed foodstuffs are generally high in Cd. The intake by the mean adult population in the Member States is estimated to be less than 30% of the PTWI, with the exception of NL (38%). Cereals, fruit and vegetables, meat and fish are the main sources of cadmium in the diet, as they are highly consumed staple foods, even if the level of cadmium is generally low. Liver and kidney (especially equine) crustaceans, mollusc and cephalopods generally contain higher levels of cadmium. The contribution of offal and molluscs to the cadmium dietary mean intake is small, as the consumption is low. Regarding high level consumers of offals and molluscs, it is necessary to promote finalized study to assess the relative risk.

Children have a lower intake than adults, according to data from FR and DE, and young children (4-6 years) have the lowest intake. Since children have lower body weights, their body burden/kg may, however, be higher than that of adults.

**Lead.** None of the most consumed foodstuffs are generally high in Pb. The intake by the mean adult population in the Member States is estimated to be 0.042 mg/day (0.29 mg/week), which is equal to a mean of 17% of the PTWI. The intake in PT is considerably higher than the average (54% of the PTWI). This high intake is strongly influenced by use of inappropriate analytical methods resulting in very high LODs. In e.g. IR, the intake is underestimated (0.4% of the PTWI) since occurrence data were available only from a few food items. Specific foodstuffs from some Member States were reported to contain very high lead levels. If these high occurrence levels are confirmed, or the sampling found to be representative, consumers in these Member States may be at risk of exceeding the PTWI.

Children have a lower intake than adults, according to data from FR and DE. Young children (4-6 years) have the lowest intake. Since children have lower body weights, their body burden/kg may, however, be higher than that of adults. In DE the body burden for children aged 4-6 years is 1 µg/bodyweight/day (35% of PTWI), whereas the body burden for adults is 0.6 µg/kg bodyweight/day (19% of PTWI). Children who are high consumers of certain foodstuffs may run a risk of exceeding the PTWI.

**Mercury.** Fish is the main source of Hg in the diet, followed by fruit and vegetables. The daily intake of total Hg by the mean adult population is estimated to be below 0.015 mg/day. Six Member States presented mercury intake data on fish products only. No data was available for organic mercury-species (i.e. Methylmercury). Predatory fish species generally contain higher levels of mercury. However, the contribution of these foods to the dietary mean intake is small, since the consumption is low. Two Member States has reported high intakes from fruit and vegetables. These intakes, however, also include data from mushrooms and dried products which may increase the mean content in this food group more than relevant.

Regarding high level consumers of these products, it is necessary to promote finalized study to know the consumption of the most contaminated foods for the higher consumers groups.

Children have a lower intake than adults, according to data from FR and DE, and young children (4-6 years) have the lowest intake. Since children have lower body weights, their body burden/kg may, however, be higher than that of adults and intakes may appear to exceed the PTWI for methylmercury in 4-6 years old. However, the data submitted were for total mercury and the relative proportions of methylmercury to the total mercury in the different foods need further investigations. This would allow for more accurate intake estimates in relation to methylmercury.

**The Member States** lack a common, co-ordinated, approach for the analysis of foodstuffs and collection of validated results for the purpose of establishing background data for intake calculation/estimation.

**A large number** of confounding factors were identified during the work on the project. These confounding factors may artificially increase the intake levels considerably, or they may reduce the intake levels. The interpretation of the results from this project must therefore be viewed with caution.

**Commission regulation 466/2001.** In some foodstuffs occurrence data are occasionally exceeding the ML. Exceedings give the appearance of being sporadic rather than systematic.

## 1.9 Participants in SCOOP project 3.2.11

Member State	Participant and institute
<b>Austria</b>	<p><b>Dr. ROLAND GROSSGUT</b>                      Austrian Agency for Health and Food Safety                      Spargelfeldstrasse 191, 1226 Vienna                      roland.grossgut@ages.at                      Tel. +43 1 73216 4150                      Fax. +43 1 73216 2108</p>
<b>Belgium</b>	<p><b>Dr. CHRISTINE VINKX</b>                      Ministry of Social Affairs Public Health and Environment Pachecolaan                      19/5 1010 Brussels                      Christine.Vinkx@health.fgov.be                      Tel. +3222104837                      Fax.+3222104816</p> <p><b>Dr. JEAN MARIE DEGROODT</b>                      Chef de section ff Section Denrées Alimentaires                      Jean-Marie.Degroodt@iph.fgov.be                      Tel. 32 2 642 53 53                      Fax. 32 2 642 56 91</p>
<b>Denmark</b>	<p><b>Dr. ERIK H. LARSEN</b>                      Danish Veterinary and Food Administration Institute of Food Safety                      and Nutrition                      19 Mørkhøj Bygade DK-2860 Søborg.                      ehl@fdir.dk                      Tel. +45 3395 6631                      Fax. +45 33956001</p>
<b>Finland</b>	<p><b>Dr. ANJA HALLIKAINEN</b>                      National Food Agency, Vanha talvitie 5                      FIN-00581 Helsinki                      anja.hallikainen@nfa.fi                      Tel. +358 9 3931 540                      Fax. +358 9 3931 590</p> <p><b>Mr. ESKO NIEMI</b>                      Finnish Customs Laboratory Tekniikantie 13                      FIN-02150 Espoo                      esko.niemi@tulli.fi                      Tel. +358 2049 23259                      Fax. +358 9 46 3383</p>



**Ms. EIJA-RIITTA VENÄLÄINEN**

National Veterinary and Food Research Institute (EELA) P.O.BOX 45  
(Hämeentie 57)  
FIN-00581 Helsinki SF-  
eija-riitta.venalainen@eela.fi  
Tel. +358 9 3931903  
Fax. +358 9 393 1920

**France**

**Dr. THIERRY GUÉRIN**

Agence Française de Sécurité Sanitaire des Aliments (AFSSA)  
Laboratoire d'études et de recherches sur l'hygiène et la qualité des  
aliments (LERQHA) – Unité Contaminants de l'Environnement  
10, rue Pierre Curie F-94700 Maisons-Alfort cedex  
[t.guerin@afssa.fr](mailto:t.guerin@afssa.fr)  
Tel: +33 1 49 77 27 11  
Fax: +33 1 49 77 26 95

**Ms. ALEXANDRA TARD**

Agence Française de Sécurité Sanitaire des Aliments (AFSSA)  
DERNS/OCA 26-27, Av Gal LECLERC F-94701 Maisons-Alfort  
cedex  
[a.tard@afssa.fr](mailto:a.tard@afssa.fr)  
Tel: +33 1 49 77 26 27

**Germany**

**Dr. KATRIN KAPP**

Bundesinstitut für Risikobewertung  
Postfach 33 00 13 D-14191 Berlin  
[k.kapp@bfr.bund.de](mailto:k.kapp@bfr.bund.de)  
Tel-No. +49 30 8412 3299  
Fax-No. +49 30 8412 3685

**Dr. RICHARD PALAVINSKAS**

Bundesinstitut für Risikobewertung  
Postfach 33 00 13 D-14191 Berlin  
[r.palavinkas@bfr.bund.de](mailto:r.palavinkas@bfr.bund.de)  
Tel-No. +49 30 8412 3651  
Fax-No. +49 30 8412 3510

**Greece**

**Dr. KOUTSODIMOU AGLAIA**

General Chemical State Laboratory Division Of Environment An Tsoha  
16 St. 115 21 Athens  
e-mail: [gxk-environment@ath.forthnet.gr](mailto:gxk-environment@ath.forthnet.gr)  
Tel: +30-10-6479450 (or) -457  
Fax: +30-10-6466917 (or) 6465123

**Ireland**

**Ms. CHRISTINA TLUSTOS**  
Food Safety Authority of Ireland  
Abbey Court Lower Abbey St. Dublin 1.  
ctlustos@fsai.ie  
Tel. +353 1 8171311  
Fax. + 353 1 8171301

**Italy**

**Dr. PAOLO STACCHINI**  
Istituto Superiore di Sanità  
V.le Regina Elena 299. Roma.  
paolo.stacchini@iss.it  
Tel. +39649902533  
Fax. +39649387101

**the Netherlands**

**Dr. ROB RITSEMA**  
State Institute for Public Health and the Environment  
(RIVM-LACEL)  
Postbus 1. NL-3720 BA Bilthoven  
rob.ritsema@rivm.nl  
Tel.: 31.30.2742570  
Fax: 31.30.2744455

**Dr. PETRA KRISTEK**  
petra.krystek@rivm.nl  
Tel. +31-(0)30-274-2016

**Norway**

**Dr. CHRISTINA BERGSTEN**  
Norwegian Food Control Authority  
P.O. Box 8187 Dep. 0034 Oslo, Norway  
cbe@snt.no  
Tel. +47 23 21 67 87  
Fax. +47 23 21 70 00

**Portugal**

**Dr. MARIA ANTONIA CALHAU**  
Centro de Segurança Alimentar e Nutrição  
Instituto Nacional De Saude Dr Ricardo Jorge  
Av. Padre Cruz. 1649-016 Lisboa  
Luisa.Oliveira@insa.min-saude.pt  
Tel. +351-217164111  
Fax +351-217590441

**Sweden**

**Dr. WULF BECKER**  
National Food Administration  
Information & nutrition Dept.  
Box 622 SE-751 26 Uppsala  
wulf.becker@slv.se  
Tel: +46 18 175731  
Fax: +46 18 105848

**Ms. BIRGITTA SUNDSTRÖM**  
National Food Administration  
Research and development Dept.  
bisu@slv.se  
Tel: +46 18 175677

**United Kingdom**

**Dr. SARAH J. ROWLES**  
Food Standards Agency  
Aviation House, 25 Kingsway,  
London WC2B 6NH  
Sarah-Jane.Rowles@foodstandards.gsi.gov.uk  
Tel. +44 (0) 20 7 276 8708

**Ms. ELIZABETH RIPPON**  
Elizabeth.Rippon@foodstandards.gsi.gov.uk

**Co-ordinators:**

**Mr. LARS JORHEM** (Sweden)  
National food Administration,  
Research and development Dept.  
Box 622 SE-751 26 Uppsala  
lajo@slv.se  
Tel. +46 18 175673  
Fax. +46 18 105848

**Dr. MASSIMO BALDINI** (Italy)  
Istituto Superiore di Sanità.  
V.le Regina Elena 299-Roma  
baldini@iss.it  
Tel. +39649902533  
Fax. +39649387101

**Scientific secretary:**

**Dr. FRANCESCO. CUBADDA**  
Istituto Superiore di Sanità.  
V.le Regina Elena 299-Roma  
francesco.cubadda@iss.it  
Tel. +39649902740  
Fax. +39649387101

## 1.10 Glossary

<b>AQA</b>	analytical quality assurance
<b>CRM</b>	certified reference material
<b>CV-AAS</b>	cold vapour - atomic absorption spectrometry
<b>DA</b>	dry ashing
<b>ETA-AAS</b>	atomic absorption spectrophotometry-electrothermal atomization
<b>FAAS</b>	flame atomic absorption spectrometry
<b>GC- QFAAS</b>	gas-chromatography-quartz furnace atomic absorption spectrometry
<b>GC-MS</b>	gas-chromatography-mass-spectrometry
<b>GF-AAS</b>	graphite furnace - atomic absorption spectrometry
<b>HG-AAS</b>	hydride generation – atomic absorption spectrometry
<b>ICP-AES</b>	inductively coupled plasma - atomic emission spectrometry
<b>ICP-MS</b>	inductively coupled plasma - mass spectrometry
<b>LOD</b>	limit of detection
<b>LOQ</b>	limit of quantification
<b>PT</b>	proficiency testing
<b>PTDI</b>	provisional tolerable daily intake
<b>PTWI</b>	provisional tolerable weekly intake
<b>SCF</b>	scientific committee for food
<b>SCOOP</b>	scientific co-operation on questions relating to food (directive 93/5/EEC)
<b>VM</b>	voltammetric methods
<b>WG</b>	wet digestion

## 2. DIETARY INTAKE OF ARSENIC

### 2.1 Toxicology

Arsenic is present in seafood at high concentration levels, presumably mainly as organically bound arsenic species. The methylated forms of the element (e.g. dimethylarsinate) have a low level of toxicity, and the principal arsenic species found in fish and crustaceans, arsenobetaine, is considered virtually non-toxic. In shellfish, molluscs and seaweed dimethylarsinyl-riboside derivatives, known as arsenosugars, are the dominating species. The toxicity of these species is not known in detail but appears to be reasonably low. Inorganic arsenic, present as As(III) and As (V), found in food are the most toxic forms. Therefore information about both inorganic and total (i.e. organic + inorganic) arsenic would have been valuable for the aim of the task. No data on the levels of inorganic As became available during the project, however. Symptoms of chronic arsenic poisoning include weakness, debility, and lassitude, loss of hair, hoarseness and loss of weight. Arsenic is also considered to be carcinogenic (ref. 1-6).

### 2.2 Recommendations on intake limitations

A PTWI has been established for arsenic in drinking water (0.015 mg kg<sup>-1</sup> bodyweight) in the form of inorganic arsenic, but not for other foodstuffs (WHO 1989) The report (WHO 1989) indicated that certain ethnical and regional populations with a large consumption of fish had arsenic intakes (in the form of organoarsenicals) of about 0.050 mg/kg body weight, without any report of ill effects. This corresponds to a daily intake of 3.5 mg for a person weighing 70 kg. No recommendations are presently given for the intake of arsenic by children.

### 2.3 Intake of arsenic by the mean adult population

Eleven Member States submitted data for the mean adult population (BE for 14-18 year olds). In addition, several Member States submitted data for other population groups (Table 1.1)

The total consumption of food for which there are occurrence data available are shown in Table 2.1. Most of the arsenic in our food comes from fish and other seafood (Table 2.2). Nine Member States have submitted data for these food groups. For most of the other food groups the available data are very limited, with the exception of DK and the UK, which has carried out complete dietary intake surveys. It is thus difficult to make an accurate estimate of the total intake of arsenic in the different Member States. The data from DK and the UK, however, indicate that fish and other seafood provide more than 50% of the As to the daily diet. The daily intake of As from fish and other seafood is below 350 µg /day in all Member States.

Assuming that fish provides approximately 50 % of the As in our diet, the total intake would be below 1000 µg/day. Table 2.3 which describes the intake on a weekly basis is included to facilitate comparison, since the other elements in this project are shown in relation to the PTWI, which is based on the weekly consumption.

**Table 2.1. As. Consumption of food in g/day by the mean adult population in the Member States. The figures are based on products for which occurrence data for As are available.**

Food group	BE	DK	FI	FR	DE	HE	IR	IT	PT	SE	UK	Mean
Milk and milk products		426	420		0.1						281	<b>282</b>
Condensed and milk powder, cheese, yoghurt		50			41						60	<b>50</b>
Fats and oils		79			21						27	<b>42</b>
Fruit and vegetables		424		353	352	0.47 <sup>2</sup>					379	<b>302</b>
Confectionary		44			5.9							<b>25</b>
Cereals and bakery wares		227		63	188			43			209	<b>146</b>
Meat		107			175		88				88	<b>114</b>
Offal					2.0		0.9				1	<b>1.3</b>
Fish	13	23	39	30	16	18		32		27	14	<b>24</b>
Bivalves, crustaceans and cephalopods	2.5				0.8	2.6						<b>2.0</b>
Eggs		36			33						14	<b>28</b>
Sweeteners					13			8.1			63	<b>28</b>
Salts and spices				9.3	2.3							<b>5.8</b>
Beverages		1653 <sup>1</sup>		717 <sup>3</sup>	376 <sup>1</sup>				0.2		937	<b>737</b>
Ready to eat											2	<b>2</b>
<b>Sum</b>	<b>16</b>	<b>3069</b>	<b>458</b>	<b>1172</b>	<b>1227</b>	<b>21</b>	<b>89</b>	<b>82</b>	<b>0.2</b>	<b>27</b>	<b>2075</b>	<b>178</b>

<sup>1</sup>Including drinking water. <sup>2</sup> Dried and preserved fruit. <sup>3</sup> Water + alcoholic beverages

In Greece the As-intake is extremely low (Table 2.2), which is surprising since the consumption of fish and other seafood is of the same order of magnitude as in most other Member States. The occurrence data for fish from Greek studies indicate much lower As-levels than in all other Member States. Possible reasons for this will be discussed in section 2.6.

**Table 2.2. Arsenic. Daily Intake (µg/day) by the Mean Adult Population.**

Food	BE	DK	FI	FR	DE	HE	IR	IT	PT	SE	UK	Mean
Milk and dairy products		3.9	1		0.16						0.11	<b>1.3</b>
Fats and oils					0.10						0.08	<b>0.09</b>
Fruits and vegetable		6.2		7.4	7.60	0.005					0.95	<b>4.4</b>
Cereals and bakery wares		8.3		0.8	9.40			0.76			2.0	<b>4.2</b>
Meat and offal		2.6			3.52		0.98				0.29	<b>1.8</b>
Fish	240	32.7	13.7	135	11.2	0.4		308		101	61.0	<b>100</b>
Bivalves, cephalopods, crustaceans	25				1.10	0.05						<b>8.7</b>
Eggs		0.2			0.17						0.01	<b>0.13</b>
Sweeteners					0.08			0.015			0.32	<b>0.14</b>
Salts and spice				2.0	0.17							<b>1.1</b>
Beverages		9.7 <sup>1</sup>		2.8 <sup>2</sup>	3.3				0.001		1.0	<b>3.4</b>
Ready to eat											0.01	<b>0.01</b>
<b>Sum</b>	<b>265</b>	<b>64</b>	<b>15</b>	<b>148</b>	<b>37</b>	<b>0.5</b>	<b>0.98</b>	<b>309</b>	<b>0.001</b>	<b>101</b>	<b>65.8</b>	<b>125</b>

<sup>1</sup>Including drinking water. <sup>2</sup> Water + alcoholic beverages

**Table 2.3. Arsenic. Weekly Intake (µg/week) by the Mean Adult Population**

Food	BE	DK	FI	FR	DE	HE	IR	IT	PT	SE	UK	Mean
Milk and dairy products		27.3	7		1.10						0.77	<b>9.0</b>
Fats and oils					0.72						0.56	<b>0.64</b>
Fruit and vegetables		43.4		51.6	53.2	0.04					6.65	<b>31</b>
Cereals and bakery wares		58.1		5.5	65.8			5.32			14	<b>30</b>
Meat and offal		18.2			24.6		6.86				2.06	<b>13</b>
Fish	1680	228.9	95.9	943	78.4	2.8		2156		707	427	<b>702</b>
Bivalves, cephalopods, crustaceans,	175				7.69	0.35						<b>61</b>
Eggs		1.4			1.17						0.07	<b>0.88</b>
Sweeteners					0.55			0.105			2.24	<b>0.97</b>
Salts and spices				14.2	1.19							<b>7.7</b>
Beverages		67.9 <sup>1</sup>		19.4 <sup>2</sup>	22.9				0.007		7	<b>23</b>
Ready to eat											0.07	<b>0.07</b>
<b>Sum</b>	<b>1885</b>	<b>445</b>	<b>103</b>	<b>1034</b>	<b>257</b>	<b>3.2</b>	<b>6.9</b>	<b>2161</b>	<b>0.007</b>	<b>707</b>	<b>460</b>	<b>880</b>

<sup>1</sup>Including drinking water. <sup>2</sup> Water + alcoholic beverages

The origin of the fish, i.e. the type of water in which it was caught is of great importance. Fish from marine waters have arsenic-levels up to ten times higher than fish from brackish waters, which in turn has levels up to ten times higher than fish from freshwater lakes and rivers. This makes an intake estimation very complicated and uncertain, since the same species of fish can live in different types of water. For example, cod and herring exist in both marine and brackish water, pike and perch in both brackish and fresh water (see reference SE 001 in *Annex A*).

At the present time there are no data available describing how large is the part of the total arsenic in the diet that consists of the more toxic inorganic species (As(III) & As(V)).

## 2.4 Intake of arsenic by children: Mean population

Data was reported for three different age groups by DE and FR (Table 2.4). However, no recommendations are presently given for the intake of arsenic by children. For the smaller children in DE the intake is in the order of 50% of the mean adult population, and for the older children approximately 75%. In FR the intake by children is near 70% of the mean adult population. This estimation is, however, based on very few food groups. In DE the As-intake is reported to be larger from cereals and bakery wares than from fish.

High level daily intake intake by children in the mean population group, as well as by children in the consumers only group are shown in section 2.8, table 2.24.

## 2.5 Legislation

There is presently no legislation in force for arsenic in foodstuffs within the EU.

**Table 2.4. Arsenic. Intake ( $\mu\text{g}/\text{day}$ ) by children in various age brackets. Mean Population.**

	Daily intake			Weekly intake		
	Age bracket, year			Age bracket, year		
	3-14	4-6	10-12	3-14	4-6	10-12
<b>Food</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>
Milk and dairy products		0.08	0.09		0.54	0.61
Fats and oils		0.06	0.089		0.45	0.62
Fruits and vegetable	5.1	4.4	5.7	36	31	40
Confectionary		0.14	0.16		0.98	1.09
Cereals and bakery wares	1.0	6.5	8.9	7.0	45	62
Meat and offal		1.8	2.9		13	20
Fish	92	5.1	7.0	643	36	49
Bivalves, cephalopods, crustaceans		0.21	0.24		1.5	1.7
Eggs		0.11	0.13		0.75	0.90
Sweeteners		0.05	0.056		0.35	0.39
Salt and spices	1.4	0.10	0.14	9.8	0.71	0.96
Beverages	1.3*	1.4	1.6	9.2*	9.9	11
<b>Sum/age bracket</b>	<b>101</b>	<b>20</b>	<b>27</b>	<b>705</b>	<b>140</b>	<b>189</b>

\*Water + alcoholic beverages

## 2.6 Comments on the mean adult population intake of arsenic by Member State

This section reports the intake of the mean adult population, and children in FR and DE. A short comment on the result from each Member State is given. Tables 2.5 – 2.20 provides additional information. Tables on intake by consumers, high-risk groups or particular age brackets are found in tables 2.21 – 2.24.

### BELGIUM

#### Estimated intake of arsenic

The intake is based on the occurrence in fish and seafood and is fairly high ( $265 \mu\text{g}/\text{day}$ ), compared to the level in fish and seafood in other Member States. The age group for which the intake is estimated is 14-18 years old, which may perhaps not be representative for the adult population in Belgium.

#### Analytical Quality Assurance

One certified reference material have been used. Participation in several proficiency tests (PT) has resulted in both acceptable and non-acceptable Z-scores.

### DENMARK

#### Estimated intake of arsenic

In the Danish intake survey, which covers all major food groups, fish contribute just over 50% to the mean daily intake of arsenic ( $64 \mu\text{g}/\text{day}$ ). This is followed by beverages (15%) and cereals and bread (13%). This reflects the consumption pattern, since the fish has a mean As-content of  $1420 \mu\text{g}/\text{kg}$  and the consumption is small;  $23 \text{ g}/\text{day}$ , whereas beverages have a



content of only 6 µg/kg, but the consumption is 1653 g/day. Data other than fish are considerably older (1987 and earlier), but considered valid for the purpose.

**Analytical Quality Assurance**

A marine CRM was analysed together with the fish survey. The results were acceptable. No results from PT-programmes were reported.

FINLAND

**Estimated intake of arsenic**

Fish and milk are included. The mean As-intake is 15 µg/day, of which 14 µg comes from fish. This low intake from fish is probably due to consumption primarily of fish from fresh and brackish water.

**Analytical Quality Assurance**

Use of CRMs and participation in PT programmes is reported, but no analytical data were provided.

FRANCE

**Estimated intake of arsenic**

The survey covers several types of foodstuffs, corresponding to a consumption of 1172 g/day on 2195 g/day in total. Fish and fish products contribute 135 µg to the mean daily intake of 148 µg/day (95%). For children (3-14 years) the daily intake is 101 µg, of which fish contribute 92 µg (91%).

**Analytical Quality Assurance**

Two certified reference materials has been used, as well as participation in relevant fish and fish products PTs, with acceptable results.

GERMANY

**Estimated intake of arsenic**

The survey contains several different foodstuffs, including fish, crustaceans and bivalves that together provide 12.3 µg (33%) to the mean daily intake of 37 µg: The contribution from vegetables, fruits and cereals is 17 µg. (46 %). For children (4-6 years) the daily intake is 20 µg, of which fish, crustaceans and bivalves contribute 5.3 µg (26%). Older children (10-12 years) have an intake of 27µg/day, of which fish, crustaceans and bivalves contribute 7.2 µg/day (27%)

**Analytical Quality Assurance**

Acceptable results for several certified reference material and participation in PT-programmes are reported.

GREECE

**Estimated intake of arsenic**

The mean daily intake of arsenic is extremely low, only 0.045 µg/day. This is several orders of magnitude lower than in any other country that has reported intake values based, wholly or partly, on fish. The reported arsenic level in fish is on average 19-22 µg/kg. Most of the fish analysed in Greece is assumed to be of Mediterranean origin. It is surprising to find such low levels in marine species. Concentrations at this level are usually only found in freshwater species. It is noteworthy that all the results come from one laboratory. The data has not been verified by, e.g., analysis in an independent laboratory and must be viewed with caution.

**Analytical Quality Assurance**

The laboratory have participated in one PT-programme with a not satisfactory result.

IRELAND

**Estimated intake of arsenic**

The intake is estimated on the basis of different meat products only. The mean daily intake is thus very low, 0.97 µg/day.

**Analytical Quality Assurance**

Participation in PT-programmes is indicated, but no results reported. Results for one CRM is reported and acceptable.

ITALY

**Estimated intake of arsenic**

In addition to seafood, pasta and honey was analysed. Fish contributes, however, 100% to the daily intake of 310 µg.

**Analytical Quality Assurance**

Use of CRMs and participation in PT programmes is reported, but no analytical data were provided.

the NETHERLANDS

**Estimated intake of arsenic**

The arsenic data available was considered too limited for an attempt to calculate a relevant mean daily intake for arsenic.

PORTUGAL

**Estimated intake of arsenic**

Only the content in mineral water reported, which provides an intake of 0.001 µg/day.

**Analytical Quality Assurance**

Use of CRMs is indicated. No results for CRMs or PTs were provided.

SWEDEN

**Estimated intake of arsenic**

Only fish data reported. Fish provides 101µg to the daily intake. Species from fresh-, brackish- and marine waters are included.

**Analytical Quality Assurance**

The fish survey included certified reference materials (CRM). Results from several PT-programmes are included. The results of both CRMs and PTs are acceptable.

UNITED KINGDOM

**Estimated intake of arsenic**

In the British intake survey, which covers all major food groups, fish and shellfish combined contribute 61 µg of the mean daily intake of 66 µg.

**Analytical Quality Assurance**

Several CRMs were analysed during the survey, as well as participation in a number of PT-rounds with acceptable results.

## 2.7 Comments on arsenic in specific food groups

Only seafood has a major impact on the intake of arsenic (see Table 2.14 Arsenic in fish and fish products including MCE). Nine Member States reported results for fish and other seafood. The intake range from 0.4 (HE) to 308 µg/day (IT) for the mean adult population. For the high level the intake range up to 901 µg/day (BE). The daily consumption of fish is similar within the Member States and range between 13 – 39 g/day.

Other food groups will therefore not be commented on. All specific results are shown in tables 2.5 – 2.20.

**Table 2.5. Arsenic in dairy products, excluding products of category 2: *Milk* (Cat. 1.1-1.5)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	426		0.007	2.8		4.4
FINLAND	419.5		<0.005	1.00		6.8
U. K.	281		0.0004	0.11		<1

**Table 2.6. Arsenic in dairy products, excluding products of category 2: *Cheese* (Cat. 1.6)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	50		0.021	1.1		1.7
GERMANY	41.25	111.2	0.004	0.157	0.423	2.3
U. K.	60		0.002	0.12		<1

**Table 2.7. Arsenic in fats and oils (Cat. 2)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
GERMANY	20.53	50.7	0.005	0.103	0.254	1.1
U. K.	27		0.003	0.08		<1

**Table 2.8. Arsenic in fruit (Cat. 4.1)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	154		0.007	1.1		1.7
GERMANY	102	293	0.006	0.615	1.756	5.7
GREECE*	0.47	0	0.01	0.0047	0	1.04
U. K.	113		0.0015	0.18		<2

\* Dried and preserved fruit

**Table 2.9. Arsenic in vegetables, incl. mushrooms & fungi, roots, tubers, pulses, legumes, nuts and seeds (Cat. 4.2)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	270		0.019	5.1		8.0
FRANCE	353	702	0.021	7.4	14.6	5.0
GERMANY	250	508	0.014-0.009	6.99	15.15	13.9
U. K.	266		0.0028	0.77		<1

**Table 2.10. Arsenic in confectioneries (Cat. 5)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
GERMANY	5.86	28.6	0.015	0.088	0.429	0.3

**Table 2.11. Arsenic in cereals and cereal products, incl. flours & starches from roots & tubers, pulses & legumes, excluding bakery wares (Cat. 6)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK*	227		0.037	8.3		13.1
FRANCE	62.9	164.3	0.013	0.8	2.1	0.53
GERMANY**	188	343	0.05	9.40	17.2	10.5
ITALY	42.5	47	0.018	0.765	0.846	0.25
U. K.*	209		0.006	2.0		4

\*Cereals and bread. \*\*Cereals and bakery wares

**Table 2.12. Arsenic in meat and meat products, including poultry and game (Cat. 8).**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	107		0.024	2.6		4.1
GERMANY	175	389	0.009-0.033	3.51	7.94	9.7
IRELAND	87.85	192.71	0.0037-0.01	0.97	2.02	
U. K.	88		0.0033	0.29		<3

**Table 2.13. Arsenic in offals (Cat. 8).**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
GERMANY	1.95	17.9	0.02	0.039	0.358	0.11
IRELAND	0.876	0	0.010	0.0088	0	
U. K.	1		0.004	0.004		<1

**Table 2.14. Arsenic in fish and fish products, including molluscs, crustaceans and echinoderms (Cat. 9)**

Member State	Consumption (g/day)		Mean level in food ( $\mu\text{g/g}$ )	Intake ( $\mu\text{g/day}$ )		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	16	61	3.4-18.0	265	901	100
DENMARK*	23		1.42	32.7		51.4
FINLAND*	38.8		0.017-1.0	13.71		93.2
FRANCE*	29.8	87.1	4.5	134.7	394.3	91.2
GERMANY	16.9	63.4	0.694-1.409	12.3	45.4	0.94
GREECE	20.6	89	0.019-0.022	0.445	1.904	97.98
ITALY	31.8	48.3	9.7	308.46	468.51	100
SWEDEN*	27.3		0.15-4.8	101		100
U. K.	14		4.4	61		94

\* only fish and fish products

**Table 2.15. Arsenic in eggs and egg products (Cat.10)**

Member State	Consumption (g/day)		Mean level in food ( $\mu\text{g/g}$ )	Intake ( $\mu\text{g/day}$ )		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	36		0.006	0.2		0.3
GERMANY	33.4	81	0.005	0.167	0.405	1.9
U. K.	14		0.001	0.01		<1

**Table 2.16. Arsenic in sweeteners including honey (Cat 11)**

Member State	Consumption (g/day)		Mean level in food ( $\mu\text{g/g}$ )	Intake ( $\mu\text{g/day}$ )		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
GERMANY	13.0	54.1	0.005-0.009	0.079	0.337	0.72
ITALY	8.1	16.9	0.0018	0.01458	0.0304	0.005
U. K. *	63		0.005	0.32		<1

\*Including preserves

**Table 2.17 Arsenic in salt, spices, soups, sauces, salads, protein products etc (Cat 12)**

Member State	Consumption (g/day)		Mean level in food ( $\mu\text{g/g}$ )	Intake ( $\mu\text{g/day}$ )		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
FRANCE*	9.3	23.3	0.219	2.0	5.1	1.4
GERMANY	2.26	6.0	0.02-0.097	0.171	0.405	0.13

\* Excluding soups

**Table 2.18. Arsenic in non-alcoholic ("soft") beverages (Cat. 14.1)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK*	1653		0.006	9.7		15.3
FRANCE**	556.9	1234.3	0.0028	1.6	3.5	1.1
GERMANY	329	1051	0.002-0.006	1.45	4.79	18.2
PORTUGAL	0.165		0.007885	0.0013		
U. K	937		0.001	1.0		2

\* Including drinking water. \*\* Only water.

**Table 2.19. Arsenic in alcoholic beverages, incl. alcohol-free and low-alcoholic counterparts (Cat. 14.2)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
FRANCE	159.9	628.6	0.0075	1.2	4.7	0.81
GERMANY	47.0	222	0.039	1.83	8.67	2.6

\* only wine

**Table 2.20. Arsenic in ready to eat (Cat 15)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
U. K.	2		0.006	0.01		<1

## 2.8 Estimated daily intake of arsenic by other population groups

The UK has complete intake studies for consumers. The data from the UK, as well as data on high level intake for the mean adult population and consumers by other Member States, are presented in tables 2.21 – 2.23. The intake estimates for certain children groups in DE and FR are found in table 2.24.

**Table 2.21. Arsenic. Daily Intake ( $\mu\text{g}/\text{day}$ ) by the Mean Adult Population. High Level.**

Food group	BE	FR	DE	HE	IR	IT
Milk and dairy products			0.43			
Fats and oils			0.25			
Fruit and vegetables		14.6	16.9	0		
Cereals and bakery wares		2.1	17.2			0.85
Meat and offal			8.30		2.02	
Fish	858	394	42.7	1.56		469
Bivalves, cephalopods, crustaceans, squid	43		2.68	0.342		
Eggs			0.41			
Sweeteners			0.34			0.03
Salt and spices		5.1	0.40			
Beverages		3.5-4.7*	13.5			

\*Water + alcoholic beverages

**Table 2.22. Arsenic Daily Intake ( $\mu\text{g}/\text{day}$ ) by Adult Consumers Only. Mean level**

Food group	BE	FR	DE	HE	IR	UK
Milk, milk products						0.09
Condensed, powder milk, cheese, yoghurt			0.17			0.11
Fats and oils			0.10			0.05
Fruits and vegetables		7.37	8.3	0.12		0.98
Confectionary			0.20			0.09
Cereals and bakery wares		0.9	9.4			1.4
Meat			4.3		2.36	0.47
Offal			0.29			0.07
Fish and fish products	424	170	20.6	0.902		146
Bivalve, crustaceans and cephalopods	455		20.6	0.703		61
Eggs			0.17			0.03
Sweeteners			0.139			
Salts and spices		2.1	0,173			
Beverages		1.7-1.7*	4.95			0.67
Ready to eat						0.03
<b>Total intake</b>						<b>120</b>

\*Water + alcoholic beverages

**Table 2.23. Arsenic Daily Intake (µg/day) by Consumers Only. High level**

FOOD	BE	FR	DE	HE	IR	UK
Milk, milk products						0.25
Condensed, powder milk, cheese, yoghurt			0.429			0.34
Fats and oils			0.254			0.13
Fruits and vegetables		14.6	18.5	0.36		2.04
Confectionary			0.642			0.34
Cereals and bakery wares		2.1	17.159			3.12
Meat			7.981		5.45	1.03
Offal			0.736			0.26
Fish and fish products	986	426.6	53.16	2.09		429
Bivalve, crustaceans and cephalopods	98		51.781	1.805		241
Eggs			0.408			0.07
Sweeteners			0.44			0.48
Salts and spices		5.2	0.407			
Beverages		3.6-5.6*	16.97			1.66
Ready to eat						0.15
<b>Total intake</b>						<b>420</b>

\*Water + alcoholic beverages

**Table 2.24. Arsenic. Daily intake (µg/day) for children in different age groups.**

	Mean Population High level			Consumers Only Mean level			Consumers Only High level		
	Age bracket, years			Age bracket, years			Age bracket, years		
	3-14	4-6	10-14	3-14	4-6	10-12	3-14	4-6	10-12
Food	FR	DE	DE	FR	DE	DE	FR	DE	DE
Milk and dairy products		0.24	0.26		0.086	0.097		0.25	0.28
Fats and oils		0.16	0.23		0.064	0.089		0.16	0.23
Fruit and vegetable	10	10.0	12.2	5.1	4.77	6.2	10	10.89	13.55
Confectionary		0.52	0.54		0.191	0.221		0.62	0.62
Cereals and bakery wares	2.2	11	16	1	6.477	8.859	2.2	11	16
Meat and offal		4.2	6.36		2.43	3.88		4.9	6.8
Fish	259	20	27	119	11	15	275	29	39
Bivalves, cephalopods, crustaceans		0.00	0.00		10	14			
Eggs		0.26	0.29		0.11	0.13		0.26	0.293
Sweeteners		0.2	0.2		0.87	0.1		0.27	0.31
Salt and spices	4.0	0.25	0.34	1.6	0.10	0.14	4.2	0.25	0.34
Beverages	0.1-2.8*	4.1	5.1	0.2-1.4*	1.7	1.9	0.6-2.8*	4.54	6.04

\*Water + alcoholic beverages



## 2.9 Occurrence summary table for arsenic

This table contains summaries of occurrence data that has been used in the intake calculation. It provides information on the mean concentration level, median levels where available and minimum and maximum values.

**Table 2.25.**

<b>Artenic. Occurrence, summary data for individual food samples. Unit: mg/kg</b>									
Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total As	Median level of total As	Min	Max
<b>Belgium</b>									
1	dairy product	216						< 0.050	0.093
4	algae	10				42.732	31.805	20.51	97.18
8	meat	4						< 0.120	
9	fish	165				17.95		0.513	132.23
10	bivalves, cephalopods	33				28.42		0.62	203.93
11	crustaceans	36				3.351		0.7	11.562
13	honey	1				< 0.050			
15	dietetic formulae	5						< 0.12	
<b>Denmark</b>									
	Fish	225	DK-004	1993-97		1.42	0.95	0.14	11.50
<b>Finland</b>									
1.1.1	milk	10	FI 005	2001		<0.005			
9.1.1	rainbow trout	8	FI 006	2001		1.01		0.579	1.52
9.1.1	pike	15	FI 007	2001-2002		0.092		0.022	0.17
9.1.1	perch	28	FI 007	2002		0.080		0.01	0.288
9.1.1	sprat	6	FI 007	2002		0.56		0.465	0.671
9.1.1	Pike perch	10	FI 007	2002		0.090		0.009	0.223
9.1.1	salmon	8	FI 007	2002		0.735		0.358	0.96
9.1.1	bream	4	FI 007	2002		0.037		0.021	0.052
9.1.1	vendace	7	FI 007	2002		0.062		0.044	0.103
9.1.1	burbot	7	FI 007	2002		0.093		0.027	0.149
9.1.1	powan	3	FI 007	2002		0.017		0.007	0.034
9.1.1	Baltic herring	32	FI 007	2002		0.414		0.155	1.08
<b>France</b>									
4	Fruits and vegetables	30	FR 006	2000-2001		0.021		< 0.005	0.100
6	Cereals and cereal products	19	FR 006	2001		< 0.0125		< 0.0125	< 0.0125
9	Fish and fish products	60	FR 004	2000		4.52		0.68	23
14	Salts, spices, sauces, excl. Soups	130	FR 006	2000-2001		0.219		< 0.0015	2.2
16	Waters (mineral and spring)	76	FR 006	2000-2001		0.0028		< 0.00125	0.016
18	Alcoholic beverages	39	FR 006	2000-2001		0.0075		< 0.0015	0.019
<b>Germany</b>									
1.1	milk	3		1999		0.003		<0.005	
1.6	cheese	68		1997-2000		0.004		<0.001	<0.01
2	oil	1		2001		0.005		<0.01	
4.1	fruits	963		1997-2002		0.006		<0.0002	0.055
4.2	nuts and seeds	163		1997-2001		0.029		<0.007	0.17
4.2	vegetable	1172		1997-2002		0.027		<0.0007	3.5
4.2	fungi	57		1999-2001		0.09		<0.01	1.2
4.2.2.2	dried algae	51		2000-2002		36.8		<0.025	105

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Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total As	Median level of total As	Min	Max
4.2.2.2	dried fungi	15		2001		0.408		<0.2	1.237
4.2.2.6	concentrated tomato	71		2000		0.014		<0.007	0.555
5.1	cocoa products	13		2002		0.015		<0.01	0.18
6 and 7	cereals, cereal products, bakery wares	94		1999-2002		0.05		<0.01	0.3
8.1	fresh meat	305		1997-2002		0.009		<0.001	0.26
8.1	game	15		1998		0.032		<0.006	0.2
8.4	offal	1042		1997-2002		0.02		<0.001	0.17
8.5, 8.3 and 8.2	processed meat	3		2000-2002		0.033		<0.05	0.048
9.1 without 9.1.2 to 9.1.4	fish	993		1997-2002		0.694		<0.01	23
9.1.2 to 9.1.4	bivalves, crustaceans, squids	84		1997-2002		1.409		<0.01	10.5
10.1	eggs	25		1997		0.005		<0.01	
11.1	sugar	18		1999-2002		0.005		<0.01	
11.3	honey	48		2000-2001		0.009		<0.007	0.04
11.4	sweeteners	1		2000		0.005		<0.01	
12.1	salt	6		2001-2002		0.097		<0.01	0.11
12.2	herbs and spices	156		1997-2002		0.02		<0.007	1.795
13.1 and 13.2	infant food	195		1997-2002		0.012		<0.005	0.13
13.6	food supplements	39		1999-2002		2.268		<0.002	51
14.1.1	water	3994		1997-2002		0.004		<0.0005	0.24
14.1.2 and 14.1.3	vegetal juice	4		2002		0.002		<0.004	
14.1.2 and 14.1.3	fruit juice	143		1998-2002		0.006		<0.0007	0.048
14.1.5	tea and coffee	133		1998-2002		0.144		<0.0005	1
14.2.3	wine	40		1997-2002		0.039		<0.01	0.13
<b>Greece</b>									
4.1.2.2	Dried fruit	4		2000		< 0.020	< 0.020	< 0.020	< 0.020
9.1.1.30 X3	Small fish eaten whole	10		2001		0.047	0.002	0.002	0.388
9.1.1.30 X4	Bogue	4		2001		0.003	0.003	0.002	0.005
9.1.1.30 X5	Cuttlefish	3		2001		0.014	0.008	0.008	0.002
9.1.1.30 X6	Perch	3		2001		0.009	0.008	0.006	0.012
9.1.1.30 X7	Seabream	3		2001		0.007	0.007	0.003	0.012
9.1.2.1	Mussels	2		2001		0.012	0.012	0.008	0.017
9.1.3.2	Squid	2		2001		0.002	0.002	0.002	0.002
9.1.3.3	Octopus	2		2001		0.015	0.015	0.009	0.020
9.1.1.5	Grey mullet	1		2001		0.002	0.002	0.002	0.002
9.2.1	Frozen fish, fish fillets and fish	3		2001		0.009	0.009	0.006	0.012
<b>Italy</b>									
9.1.4.3	<i>Parapenaeus longirostris</i>	826	IT-001	n.a.*	M	6.8 **		2.2 **	12.1 **
9.1.4.3	<i>Aristeus antennatus</i>	387	IT-001	n.a.*	M	3.1 **		2.0 **	4.2 **
9.1.4.3	<i>Plesionika martia</i>	456	IT-001	n.a.*	M	8.2**		7.6 **	8.7 **
9.1.4.2	Norway lobster	270	IT-001	n.a.*	M	9.0 **		7.4 **	13.8 **
9.1.1.30	Hake	346	IT-002	1995	M	9.7		5.9	16.1
9.1.2.1	Mussel	30	IT-003	1995	M	3.32			
9.1.4.3	Squill or mantis shrimp	720	IT-004	1998	M	19.5		19.0	20.0
11.3	Honey	50	IT-005	1999		0.0018		<0.0005	0.0059
6.4	Pasta	11	IT-006	2002		0.018	0.016	0.004	0.032
* Reference of 2001									
** Calculated from dry weight assuming a water content of 80%									

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Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total As	Median level of total As	Min	Max
<b>Ireland</b>									
	acid casein powder	43		1995/1996		0.0200		<0.04	<0.04
	Beef	157		1997/2001		0.0053		<0.001	<0.02
	Beef (Muscle, Liver, Kidney)	56		2001		0.0100		<0.001	<0.001
	Beef Liver	21		2001		0.0100		<0.02	<0.02
	Farmed Game	7		2001		0.0100		<0.02	<0.02
	Lamb (Muscle, Liver, Kidney)	23		2001		0.0100		<0.001	<0.02
	Mackerel	1		2001		0.7900			
	Pork	100		1997/2001		0.0100		<0.02	<0.02
	Pork (Muscle, Liver, Kidney)	9		2001		0.0100		<0.02	<0.02
	Poultry	5		2001		0.0050		<0.01	<0.01
	Poultry (Muscle, Liver, Kidney)	18		2001		0.0100		<0.02	<0.02
	rennet casein powder	33		1995/1996		0.0200		<0.04	<0.04
	skim milk powder	71		1995/1996		0.0200		<0.04	<0.04
	Thyme	1		2001		0.7600			
	Wild Game Liver	36		2001		0.0100		<0.02	<0.02
Note: Table does not include all occurrence data, excluded are data for which reliable intake data could not be derived. Fuller occurrence data are shown in Table 2.33.									
<b>Norway</b>									
8	Meat	81		2000-2001		0.023		<0.003	0.115
9	Shellfish	73		1994-1996		32.92		12.7	123
<b>Portugal</b>									
	fruits and vegetables (powder, concentrate and puree)	36	PT-010	1998-2002		<0.1	<0.1	<0.1	<0.1
	frozen fruit	1	PT-010	2001		<0.1	<0.1	<0.1	<0.1
	canned beans	3	PT-020	2001				<0.003	<0.005
	chocolate	4	PT-020	2000-2002		0.0128		0.0062	0.017
	cereals	4	PT-010	2000		<0.1	<0.1	<0.1	<0.1
	cookies	1	PT-010	1998		<0.1	<0.1	<0.1	<0.1
	sugars	80	PT-010-020	1997-2002				0.006	<0.1
	artificial sweeteners	2	PT-010	2000		<0.1	<0.1	<0.1	<0.1
	natural mineral waters and source waters	13	PT-030	2000-2001		0.165		<0.005	0.025
	beer	4	PT-010	1997		<0.1	<0.1	<0.1	<0.1
	still wine	8	PT-020	2001-2002		0.004	0.004	0.003	0.007
<b>Sweden</b>									
9.1.1	Fish	9	SE 001	1992-93	F*	0.089		0.018	0.21
9.2.4.2	Crayfish	6	SE 011	1992	F	0.17		0.15	0.19
9.1.1	Fish	16	SE 001	1992-93	B*	0.51		0.17	1.0
9.1.1	Fish	12	SE 001	1992-93	M*	4.67		0.59	17.0
*F=fresh water, B=brackish water, M=marine water									
<b>United Kingdom</b>									
<i>Total Diet Study</i>									
7.1.1	Bread	20	UK/010	1997		0.005		0.002	0.007
6	Miscellaneous cereals	20	UK/010	1997		0.007		0.003	0.021
8	Carcase meat	20	UK/010	1997		0.003		0.001	0.006
8.4	Offal	20	UK/010	1997		0.004		<0.0009	0.0111
8.3	Meat Products	20	UK/010	1997		0.003		0.002	0.007
8	Poultry	20	UK/010	1997		0.004		<0.001	0.01
9	Fish	20	UK/010	1997		4.4		1.26	8.07
2	Oil & fats	20	UK/010	1997		0.003		<0.003	0.004

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Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total As	Median level of total As	Min	Max
<b>United Kingdom cont.</b>									
10	Eggs	20	UK/010	1997		0.0009		<0.0009	<0.0009
4, 5, 11	Sugar and preserves	20	UK/010	1997		0.005		<0.003	0.009
4.2	Green vegetables	20	UK/010	1997		0.003		0.0006	0.0197
4.2	Potatoes	20	UK/010	1997		0.002		<0.001	0.007
4.2	Other Vegetables	20	UK/010	1997		0.005		0.0026	0.0112
4.2.2.4	Canned vegetables	20	UK/010	1997		0.0008		<0.0006	0.0023
4.1.1	Fresh fruit	20	UK/010	1997		0.0014		<0.0006	0.0055
4.1.2	Fruit products	20	UK/010	1997		0.0019		<0.0006	0.0065
14	Beverages	20	UK/010	1997		0.001		<0.0004	0.0019
1.1	Milk	20	UK/010	1997		0.0004		<0.0004	0.0004
1, 2.2.2	Dairy produce	20	UK/010	1997		0.002		<0.001	0.007
15.2	Nuts	20	UK/010	1997		0.006		<0.003	0.018
	<i>Ad hoc Surveys</i>								
9.1.1	Fish and Shellfish	110	UK/003	1996-1997		4.29		0.28	18.00
9.1.2	Fish and Shellfish	9	UK/003	1996-1997		2.20		0.63	3.40
9.1.3	Fish and Shellfish	3	UK/003	1996-1997		4.90		4.60	5.20
9.1.4	Fish and Shellfish	12	UK/003	1996-1997		14.04		7.90	34.00
9.1 - other	Cockles and winkles	7	UK/003	1996-1997		2.35		1.40	3.20
9.2.2	Fish and Shellfish	3	UK/003	1996-1997		5.20		3.90	6.10
13	Infant Foods	96	UK/001/011	1997-1999		0.013		<0.0004	0.14
14	Beverages*	91	UK/004/005	1997		0.04		0.0002	0.15
4, 6, 14, 1, 16, 12, 2	Vegetarian Foods	99	UK/006/007	1997-1998		0.059		0.003	0.35
1, 7, 16, 15, 9, 18, 4, 12, 14, 6	Snack and Convenience foods	298	UK/002	1996-1999		0.224		0.003	16
1, 7, 16, 15, 9, 18, 4, 12, 14, 6	Snack and Convenience foods	298	UK/002	1996-1999		0.224		0.003	16

\*Including 4 samples of 5.1(dried chocolate drinks) and 3 samples of 1.1.4 (flavoured milks/yoghurts)

### References for arsenic in 2.1

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5. Heavy Metals in the Environment 2002, 217-229. Environmental aspects of arsenic toxicity Hindmarsh, J. Thomas; Abernathy, Charles O.; Peters, Gregory R.; Mccurdy, Ross F.
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### 3. DIETARY INTAKE OF CADMIUM

#### 3.1 Toxicology

**Cadmium** may be present in high concentrations in shellfish and in kidneys, particularly from older animals. Certain wild mushrooms may also contain high levels. Cadmium accumulate primarily in the kidneys and may induce kidney dysfunction, skeletal changes and reproductive deficiencies. In 1993 IARC classified cadmium and cadmium compounds in Group I (Human Carcinogens); based on evidence from human studies, mainly those on lung cancer associated with cadmium inhalation in the work place, and from animal studies. The IARC classification is qualitative only.

The SCF, in its opinion of 2 June 1995, recommended greater efforts to reduce dietary exposure to cadmium since foodstuffs are the main source of human intake of cadmium. (ref. 1-7).

#### 3.2 Recommendations on intake limitations

A Provisional Tolerable Weekly Intake (PTWI) have been decided for cadmium, 0.007 mg/kg (7 µg/kg) bodyweight. This is equal to 0.49 mg/week (490 µg/week) for a person weighing 70 kg. The average intake of cadmium by an adult in the Member States is, according to current information, 14.4 µg/day, which is equal to 101 µg/week (range 2.73 - 176µg /week). This corresponds to 0.52 – 38.2% of the PTWI, assuming an average weight of 70 kg for a Member State adult. (Note that IR presented data for only two food categories, fish meat, bivalves, crustaceans and cephalopodes).

**Table 3.1. Cadmium. Consumption of food in g/day by the Mean Adult Population in the Member States. The figures are based on products for which occurrence data are available.**

Food	BE	DK	FI	FR	DE	HE	IR	IT	NL	NO	PT	SE	UK
Milk, milk products	238	357	420	158	41	112		130				344	281
Condensed, powder milk, cheese, yoghurt	28	33		83				43	407			28	60
Fats and oils		48		20	21			20			10		27
Fruits and vegetables	179	421	142	353	352	23		448	360	255	352	171	379
Confectionary		30		5	6				52	10			
Cereals, bakery wares	199	217	183	253	188	23		66	220	175	27	142	209
Meat	137	136	71	148	175	37		18	143	80		101	88
Offal	0.3		3	3.2	2	1.6		6.5		0			1.0
Fish Meat		23	53	30	16	36	23	32	10	61	81	22	14
Bivalve, crustaceans and cephalopods	2.5		1.6	5	0.8	7.8	0.77			11	10		
Eggs		21	1.1	20	33			14		17		15	14
Sweeteners	0.4		1.1	16	13					6	31	0.6	63
Salts and spices				9.3	2.3				79				
Beverages		2003	476	1091	119			84	1091	693	149		937
Ready to eat									11	2			2.0
Composite food									282				
<b>Sum</b>	<b>782</b>	<b>3289</b>	<b>1351</b>	<b>2193</b>	<b>968*</b>	<b>240</b>	<b>24</b>	<b>861</b>	<b>2665</b>	<b>1310</b>	<b>660</b>	<b>823</b>	<b>2075</b>

\*including water (260 g/day) sum is 1227 g/day

### 3.3 Intake of cadmium by the mean adult population

Thirteen Member States submitted data for the mean adult population (BE for 14-18 year olds). In addition, several Member States submitted data for other population groups (Table 1.1).

The Tables 3.2-3.5 report the intakes for 16 food categories selected for their importance in the cadmium intake. No Member State reports intake data for all the food categories. DE(13/16) and UK (12/16) present the highest number of food categories, IR the lowest number (2/16).

The most important sources of cadmium are cereals, fruits, vegetables, meat and fish, due to their relatively large consumption. Among the food groups which give little contribution to cadmium intake levels there are: dairy products, fats and oils, eggs and beverages.

**Table 3.2. Cadmium. Daily intake ( $\mu\text{g}/\text{day}$ ) by the Mean Adult Population.**

Food group	BE	DK	FI	FR	DE	HE	IR	IT	NL	NO	PT	SE	UK	Mean
Milk, milk products	0.10	0.35	0.42	0.05		0.11		0.26	0.42			0.17	0.06	<b>0.22</b>
Condensed, powder milk, cheese, youghurt	0.03	0.00			0.12			1.47				0.055	0.07	<b>0.29</b>
Fats and oils		0.10			0.12			0.01			0.11		0.07	<b>0.08</b>
Fruit and vegetables	7.91	4.21	1.80	5.73	8.77	1.17		15.0	9.49	3.09	14.1	1.8	5.32	<b>6.54</b>
Confectionary		0.30	0.03		0.42				0.17	0.18				<b>0.22</b>
Cereals & bakery wares	4.57	8.25	6.36	1.69	5.45	1.34		3.41	4.34	7.45	0.39	3.9	5.00	<b>4.35</b>
Meat	3.30	0.29	0.09	0.66	2.07	0.27			7.14	0.75		0.35	0.53	<b>1.54</b>
Offal	0.03		0.10	0.24	0.20	0.43					0.03		0.08	<b>0.16</b>
Fish and fish products		0.29	0.32	0.20	0.18	13.9	0.07	0.11	0.10	3.56	0.20	0.10	0.18	<b>1.62</b>
Bivalve, crustaceans and cephalopods	0.34		0.15	0.68	0.09	2.14	0.32				1.05			<b>0.68</b>
Eggs	0.00	0.01	0.00	0.02	0.10					0.085		0.005	0.01	<b>0.03</b>
Sweeteners			0.00	0.05	0.06					0.01	0.47	0.001	0.45	<b>0.13</b>
Salts and spice				0.43	0.08				1.17					<b>0.56</b>
Beverages		1.85	0.095	0.85	1.59*				0.97	0.47	0.11		0.19	<b>0.74</b>
Ready to eat									0.33	0.18			0.11	<b>0.21</b>
Composite food									0.99					<b>0.99</b>
<b>Sum</b>	<b>16.3</b>	<b>16</b>	<b>9.3</b>	<b>10.6</b>	<b>19.2</b>	<b>19.3</b>	<b>0.39</b>	<b>20.2</b>	<b>25.1</b>	<b>15.8</b>	<b>16.5</b>	<b>6.4</b>	<b>12.1</b>	<b>14.4</b>

\*Including drinking water

**Table 3.3. Cadmium. Weekly intake (µg/week) by the Mean Adult Population.**

Food	BE	DK	FI	FR	DE	HE	IR	IT	NL	NO	PT	SE	UK	Mean
Milk, milk products	0.71	2.45	2.94	0.36		0.77		1.82	2.94			1.2	0.42	<b>1.51</b>
Condensed, powder milk, cheese, yoghurt	0.18	0.00			0.871			10.3				0.38	0.49	<b>2.04</b>
Fats and oils		0.70			0.86			0.07			0.77		0.49	<b>0.57</b>
Fruit and vegetables	55.4	29.5	12.60	40.1	61.39	8.19		105	66.4	21.6	99.0	12	37.2	<b>37.88</b>
Confectionary		2.1	0.21		2.91				1.19	1.26				<b>1.54</b>
Cereals and bakery wares	32.0	57.8	44.5	11.8	38.15	9.38		23.9	30.4	52.2	2.70	27	35.0	<b>30.42</b>
Meat	23.1	2.03	0.63	4.63	14.49	1.89			50.0	5.25		2.4	3.71	<b>10.81</b>
Offal	0.24		0.73	1.65	1.40	3.01					0.21		0.56	<b>1.11</b>
Fish and fish products		2.03	2.2	1.43	1.24	97.0	0.49	0.77	0.70	24.9	1.42	0.67	1.26	<b>11.33</b>
Bivalve, crustaceans and cephalopods	2.35		1.085	4.74	0.63	15.0	2.24				7.35			<b>4.77</b>
Eggs	0	0.07	0.00	0.17	0.70					0.60		0.037	0.07	<b>0.21</b>
Sweeteners			0.00	0.38	0.43					0.07	3.29	0.007	3.15	<b>1.04</b>
Salt and spices				3.01	0.56				8.19					<b>3.92</b>
Beverages		13.0	0.67	5.95	11.1*				6.79	3.29	0.77		1.33	
Ready to eat									2.31	1.26			0.84	<b>1.47</b>
Composite food									6.93					<b>6.93</b>
<b>Sum</b>	<b>114</b>	<b>112</b>	<b>66</b>	<b>74</b>	<b>134.8</b>	<b>135</b>	<b>2.73</b>	<b>141</b>	<b>176</b>	<b>110</b>	<b>116</b>	<b>45</b>	<b>85</b>	<b>101</b>

\* Including drinking water

**Table 3.4. Cadmium. Weekly Intake in % of the PTWI, by the Mean Adult Population (PTWI for Cd = 0.007mg/kg body weight = 7µg/kg body weight)**

Food group	BE	DK	FI	FR	DE	HE	IR	IT	NL	NO	PT	SE	Mean
Mean body weight [kg]	60	72	77.1	66.4	70.5	70	75	70	65.8	73	70	73.7	70.3
Milk, milk products	0.17	0.49	0.54	0.08		0.16		0.37	0.64			0.23	<b>0.335</b>
Condensed, powder milk, cheese, yoghurt	0.04	0			0.18			2.1				0.07	<b>0.48</b>
Fats and oils		0.14			0.17			0.01			0.16		<b>0.12</b>
Fruit and vegetables	13.2	5.85	2.33	8.64	12.44	1.67		21.4	14.4	4.23	20.2	2.4	<b>9.7</b>
Confectionary		0.42	0.04		0.59				0.26	0.25			<b>0.31</b>
Cereals and bakery wares	7.61	11.5	8.25	2.54	7.73	1.91		4.87	6.60	10.2	0.55	5.3	<b>6.10</b>
Meat	5.50	0.40	0.12	1.00	2.94	0.39			10.8	1.03		0.48	<b>2.52</b>
Offal	0.06		0.14	0.36	0.28	0.61					0.04		<b>0.25</b>
Fish and fish products		0.40	0.41	0.31	0.255	19.8	0.09	0.16	0.15	4.88	0.29	0.13	<b>2.44</b>
Bivalves, crustaceans and cephalopods	0.56		0.20	1.02	0.13	3.06	0.43				1.5		<b>0.99</b>
eggs	0	0.01	0.00	0.04	0.14					0.12		0.007	<b>0.045</b>
Sweeteners			0.00	0.08	0.087					0.01	0.67	0.001	<b>0.14</b>
Salt and spices				0.65	0.11				1.78				<b>0.85</b>
Beverages		2.57	0.12	1.28	2.25				1.47	0.64	0.16		<b>1.22</b>
Ready to eat									0.50	0.25			<b>0.37</b>
Composite food									1.50				<b>1.5</b>
<b>Sum</b>	<b>27.1</b>	<b>22.2</b>	<b>12.2</b>	<b>16.0</b>	<b>27.3</b>	<b>27.6</b>	<b>0.52</b>	<b>28.9</b>	<b>38.2</b>	<b>21.6</b>	<b>23.6</b>	<b>8.68</b>	<b>22</b>

\*UK uses consumer intake estimates for comparison with safety guidelines.

### 3.4 Intake of cadmium by children: Mean population

Intake data were reported by FR and DE ( BE reported intake data for 14-18 year olds, but they are included in the tables for the mean adult population). The data are shown in Table 3.5, together with data on their percentage of the PTWI. Since children have a lower body mass, their body burden per kg bodyweight will generally be larger than that for adults.

The cadmium dietary intake for children in FR is 54.8 µg/week, corresponding to 24.8% of the PTWI (31.6 kg x 7 = 221.2 µg/week). The dietary intake of the mean adult population in France is 74.3 µg/week, corresponding to 16.0% of the PTWI.

The cadmium dietary intakes for two children groups in DE are 95.2 and 121.5µg/week, corresponding respectively to 65.0% and 42.4%of the PTWI (21 kg x 7 = 147µg/week-age 4-6 years; 41 kg x 7 = 287µg/week-age 10-12 years). The dietary intake of the mean adult population in Germany is 134.8µg/week, corresponding to the 27.3% of the PTWI. Note that the cadmium dietary intakes for children 4-6 years of age, is about 2/3 of the PTWI.

In Germany children with a high consumption thus run a greater risk than adults, of exceeding the PTWI.

**Table 3.5. Cadmium. Intake by children in various age brackets. Mean Population.**

	Daily intake, µg			Weekly intake, µg			% of PTWI		
	Age bracket, year			Age bracket, year			Age bracket, year		
	3-14	4-6	10-12	3-14	4-6	10-12	3-14	4-6	10-12
<b>Food</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>
Milk and milk products	0.08			0.59			0.27		
Condensed, powder milk, cheese, yoghurt		0.060	0.069		0.42	0.483		0.28	0.17
Fats and oils		0.076	0.106		0.53	0.743		0.36	0.26
Fruits and vegetables	3.85	5.04	6.52	26.93	35	45.62	12.17	24.04	15.91
Confectionary		0.661	0.74		4.63	5.18		3.15	1.8
Cereals and bakery wares	2.03	3.756	5.138	14.21	26.29	35.966	6.43	17.88	12.55
Meat	0.46	1.023	1.622	3.25	7.161	11.354	1.47	4.88	3.96
Offal	0.12	0.087	0.17	0.82	0.609	1.19	0.37	0.42	0.41
Fish and fish products	0.14	0.081	0.111	0.97	0.567	0.777	0.44	0.39	0.27
Bivalve, crustaceans and cephalopods	0.29	0.017	0.020	2.03	0.119	0.14	0.92	0.08	0.05
Eggs	0.02	0.064	0.077	0.11	0.448	0.539	0.05	0.31	0.19
Sweeteners	0.02	0.040	0.043	0.11	0.28	0.301	0.05	0.19	0.11
Salt and spices	0.29	0.054	0.063	2.06	0.378	0.439	0.93	0.26	0.15
Beverages	0.52	2.65	2.69	3.61	18.55	18.81	1.63	12.64	6.56
<b>Sum</b>	<b>7.8</b>	<b>13.6</b>	<b>17.4</b>	<b>54.8</b>	<b>95.2</b>	<b>122</b>	<b>24.8%</b>	<b>65.0%</b>	<b>42.4%</b>

\* Mean body weight

### 3.5 Legislation

In Table 3.6 the MLs for cadmium, as defined in Commission Regulation (EC) No 466/2001, are compared with available occurrence data from the Member States. The occurrence data were



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collated to give as realistic a picture as possible. They are to some extent an approximation based on many data sets and does not claim to be an “absolute” truth.

**Table 3.6. Cadmium. Maximum Levels (mg/kg) as defined in Commission Regulation (EC) No 466/2001, and compared with occurrence data from the Member States. Figures above the ML are written in bold.**

ML	ML	BE	DK	FI	FR	DE	HE	IR	IT	NL	NO	PT	SE	UK
Meat (bovine, sheep, pig and poultry) 3.2.1	<b>0.05</b>	0.024	0.002	0.001-0.022	0.004	0.005-0.016	0.0044 0.0098	0.025-0.045		0.050	0.046		0.002	0.008-0.0097
Horsemeat (3.2.2)	<b>0.2</b>	0.041		0.024	0.056				0.075				0.042	
Liver of cattle, sheep, pig and poultry 3.2.3	<b>0.5</b>	0.068		0.011-0.034		0.102	0.27	0.081-0.015			0.0106		0.028	0.077
Kidney of cattle, sheep, pig and poultry 3.2.4	<b>1.0</b>	0.153		0.162-0.179				0.122-0.22					0.11	0.11
Muscle fish (excl. fish species listed in 3.2.5.1 3.2.5*)	<b>0.05</b>	<0.001-0.027	0.0034	0.001-0.009	0.007	0.011		0.008-0.0044	0.003	0.001-0.049	0.026	0.005	0.017	0.013
Muscle fish 3.2.5.1*	<b>0.1</b>	<0.001-0.010		0.029			0.0567			0.018				
Crustaceans 3.2.6	<b>0.5</b>	0.021		0.010	0.087		0.0030-0.0045	0.24- <b>2.54</b>		0.020-0.10				
Bivalves molluscs 3.2.7	<b>1.0</b>	0.403		0.077	0.239	0.116	0.1768- <b>2.3682</b>	0.166-0.429	0.10	0.017-0.793	<b>1.125</b>	0.104		
Cephalopodes (without viscera) 3.2.8	<b>1.0</b>	<b>1.20</b>					<0.002-0.500		0.002					
Cereals, excl. bran, germ, wheat grain and rice 3.2.9	<b>0.1</b>		0.033	0.025-0.056		0.029					0.0366	0.027	0.025	0.022-0.028
Bran, germ, wheat grain and rice 3.2.9.1	<b>0.2</b>			0.036-0.07					0.035-0.037				0.072	
Soybeans 3.2.10	<b>0.2</b>													
Vegetables and fruits, excl. leafy vegetables, and other products 3.2.11	<b>0.05</b>	<0.005-0.021	0.0029-0.0184		0.012			0.013- <b>0.20</b>	0.05- <b>0.16</b>	0.01-0.006	0.0136	0.043	0.018	0.0015
Leafy vegetables, fresh herbs, celeriac and all cultivated fungi 3.2.11.1	<b>0.2</b>	0.045	0.013		0.035	0.005-0.052		0.086- <b>0.55</b>	0.03	0.008-0.042				0.0011-0.023
Stem vegetables, root vegetables and potatoes 3.2.11.2	<b>0.1</b>	0.044	0.010-0.031		0.020			0.086- <b>0.12</b>		0.013-0.022		0.038	0.010	0.0256

### 3.6 Comments on the mean adult population intake of cadmium by Member State

This summary only reports the mean intake of the general, adult, population. Particular findings of interest are highlighted. Consumers, high-risk groups or particular age-segments are not included.

#### BELGIUM

**Estimated intake of cadmium:** data for 8 food categories. The most important are fruits and vegetables (55.38 $\mu\text{g}$  – 13.19 % PTWI), cereals and bakery wares (31.97 $\mu\text{g}$  – 7.61 % ptwi), meat (23.08 $\mu\text{g}$  – 5.50 % ptwi). The cadmium weekly intakes of the food categories is 114  $\mu\text{g}/\text{week}$ , corresponding to 27.13 % of the PTWI. The cadmium daily intake is 16.28  $\mu\text{g}/\text{day}$ . Vegetables (6.86  $\mu\text{g}$ ), bakery wares (4.57  $\mu\text{g}$ ), and meat (3.29  $\mu\text{g}$ ) represent about 90% of the sum. The age group for which the intake is estimated is between 14 and 18 years, which may perhaps not be representative of the adult population in Belgium.

#### **Analytical Quality Assurance**

Certified reference materials have been used extensively as well as participation in proficiency tests. The results showed a good correlation between found and certified results.

#### DENMARK

**Estimated intake of cadmium:** data for 10 food categories. The most important are cereals and bakery wares (57.75  $\mu\text{g}$  – 11.46 %), fruits and vegetables (29.47 $\mu\text{g}$  – 5.85 % PTWI), beverages (12.95  $\mu\text{g}$  – 2.57%), The sum of the cadmium intakes of food categories is 112  $\mu\text{g}/\text{week}$ , corresponding to 22.22 % of the PTWI. In the Danish intake survey, which covers all major food groups, cereals and bread (8.25  $\mu\text{g}$ ) contribute by 52.7 % to the mean daily intake of cadmium, which is 16 $\mu\text{g}/\text{day}$ . Vegetables contribute 3.99  $\mu\text{g}$ , which is equivalent to 25.5% of the daily intake. These two food categories represent about 80% of the daily intake.

#### **Analytical Quality Assurance**

Certified reference materials were analyzed along with the samples

#### FINLAND

**Estimated intake of cadmium:** data for 11 food categories. The most important are cereals and bakery wares (44.52  $\mu\text{g}$  – 8.25% PTWI), fruits&vegetables (12.60  $\mu\text{g}$  – 2.33% PTWI), The cadmium weekly intakes is 66 $\mu\text{g}/\text{week}$ , corresponding to 12.20 % of the PTWI. The daily intake is 9.3  $\mu\text{g}/\text{day}$ . Cereals and bakery wares (6.36  $\mu\text{g}/\text{day}$ , 68.4%) and fruits and vegetables (1.80  $\mu\text{g}/\text{day}$ , 19.35%) represent about the 88 % of the sum.

#### **Analytical Quality Assurance**

Certified reference materials and proficiency tests were used but no result reported.

#### FRANCE

**Estimated intake of cadmium:** data for 11 food categories. The most important are fruit & vegetables (40.13  $\mu\text{g}$  – 8.64% PTWI), cereals and bakery wares (11.82  $\mu\text{g}$  – 2.54% PTWI), The sum of the cadmium intakes of food categories is 74.3  $\mu\text{g}/\text{week}$ , corresponding to 16 % of the PTWI. The survey covers several types of foodstuffs which contribute to consumption levels equal to 1895 g/day with a total cadmium intakes amounting to 10.6 $\mu\text{g}/\text{day}$ . Fruit and vegetables, including mushrooms (5.73 $\mu\text{g}/\text{day}$ , 54% of the sum), cereals and cereal products (15.9% of the sum), non-alcoholic beverages (6.1%), meat (5.9%) and molluscs (4.5%) are the main sources.

#### **Analytical Quality Assurance**

Certified reference materials have been used extensively as well as participation in proficiency tests. The results showed a good correlation between found and certified results.

#### GERMANY

**Estimated intake of cadmium:** data for 13 food categories. The most important are fruit & vegetables (61.39 µg –12.44 %PTWI), cereals and bakery wares (38.15 µg–7.73% PTWI), meat (14.49 µg–2.94% PTWI), beverages (11.12 µg–2.25% PTWI). The sum of the cadmium intakes of food categories is 135µg/week, corresponding to 27.3 % of the PTWI. Vegetables ( 6.94 µg /day, 36% of the sum) and cereals & cereal products (5.45 µg /day, 28%) represent about 2/3 of the value of the cadmium intake for adults (19.2 µg /day).

#### **Analytical Quality Assurance**

Certified reference materials have been used extensively as well as participation in proficiency tests. The results showed a good correlation between found and certified results.

#### GREECE

**Estimated intake of cadmium:** data for 7 food categories. The most important are fish meat (97.0 µg –19.8% PTWI), bivalve+crustaceans+cephalopoda (15.0 µg–3.1% PTWI), cereals and bakery wares (9.38 µg–1.9% PTWI), fruit & vegetables (8.19 µg–1.67 %PTWI). The sum of cadmium intake of food categories is 135 µg/week, corresponding to 27.63 % of the PTWI. The mean daily intake of cadmium is 19.3 µg/day. Fish (13.9µg /day) and fresh bivalve(1.54µg/day) represent about 80% of the sum intakes, corresponding to 71.7% and 7.96%, respectively.

#### **Analytical Quality Assurance**

Laboratories have participated in proficiency tests programs; results regarding use of certified reference materials are reported.

#### IRELAND

**Estimated intake of cadmium:** data for 2 food categories; fish meat (0.49 µg–0.09% PTWI) and bivalve + crustaceans + cephalopoda (2.24 µg –0.43% PTWI). The sum of the cadmium intakes of food categories is 2.73 µg/week, corresponding to 0.52% of the PTWI. The intake, estimated on the basis of only two food categories, fish (0.07µg /day) and the sum of bivalves, crustaceans, cephalopoda, (0.32 µg /day) is 0.39µg /day with fish.

#### **Analytical Quality Assurance**

Laboratories have participated in proficiency tests programs; results regarding use of certified reference materials are reported.

#### ITALY

**Estimated intake of cadmium:** data for 6 food categories. The most important are fruit & vegetables (105 µg–21.4 % PTWI) cereals and bakery wares (23.87 µg –4.87% PTWI), condensed and powder milk, cheese (10.29 µg –2.1% PTWI). The sum of the cadmium intakes of food categories is 141 µg/week, corresponding to 28.9% of the PTWI. The sum of the food groups intake is 20.2 µg/day. fresh vegetables (with 15 µg/day corresponding to 74.2% of the sum) and followed by pasta (2.36 µg/day corresponding to 11.6% of the sum) represent about 85% of the sum.

#### **Analytical Quality Assurance**

Certified reference materials were analyzed along with the samples, as well as participation in proficiency tests. No data regarding correlation between found and certified results are reported.

#### THE NETHERLANDS

**Estimated intake of cadmium:** data for 10 food categories. The most important are fruit & vegetables (66.43 µg–14.4 %PTWI), meat (50.0 µg–10.8% PTWI), cereals and bakery wares (30.4 µg –6.6% PTWI), salt and spice (8.19 µg–1.78% PTWI), beverages (6.79 µg–1.47% PTWI). The sum of the cadmium intake of food categories is 176 µg/week, corresponding to 38.16 % of the PTWI. The sum of the food groups intakes is 25.1 µg/day. Fruits & vegetables (with 9.49µg /day, corresponding to 38% of the sum), meat (7.14 µg/day, 28%) and bakery wares (3.11µg/day, 12%) represent about 80% of the sum.

#### **Analytical Quality Assurance**

Certified reference materials were analyzed along with the samples, as well as participation in proficiency tests. No data regarding correlation between found and certified results are reported.

#### NORWAY

**Estimated intake of cadmium:** data for 9 food categories. The most important are cereals and bakery wares (52.2 µg–10.2% PTWI), fish meat (24.9 µg–4.9% PTWI), fruit & vegetables (21.63 µg–4.23 % PTWI), meat (5.25 µg–1.03% PTWI). The sum of the cadmium intake of food categories is 110 µg/week, corresponding to 21.6 % of the PTWI. The sum of the food group intakes is 15.8 µg/day. Cereals(7.45µg /day, corresponding to 47.2% of the sum), fish (3.56µg /day, 22.6%) and fruit & vegetables (3.09µg /day, 19.6%) represent 90% of the sum.

#### **Analytical Quality Assurance**

Certified reference materials were analyzed in parallel to the samples, as well as participation in proficiency tests. No data regarding correlation between found and certified results are reported.

#### PORTUGAL

**Estimated intake of cadmium:** data for 8 food categories. The most important are fruit & vegetables (99.0 µg–20.21 % PTWI) and bivalve+crustaceans+cephalopoda (7.35 µg–1.5% PTWI), The sum of the cadmium intake of food categories is 116 µg/week, corresponding to 23.6 % of the PTWI. The sum of the food groups intakes is 16.51 µg/day. Fruits&vegetables is about 90% of the sum.

#### **Analytical Quality Assurance**

No CRM-use reported. Participation in one PT programme reported with acceptable result.

#### SWEDEN

**Estimated intake of cadmium:** data for 8 food categories. The most important are: cereals and bakery wares (27.3 µg–5.3% PTWI), fruit & vegetables (12.5 µg –2.4 %PTWI). The sum of the cadmium intake of the food categories is 45 µg/week, corresponding to 8.7 % of the PTWI. The sum of the food group intake is 6.4 µg/day. Cereals & bakery wares (3.9µg /day, corresponding to 61% of the sum), potato (1.42µg /day, 22.3%), fruit & vegetables (0.37µg /day, 5.8%) and meat (0.35µg/day, 5.5%) represent about 95% of the sum.

#### **Analytical Quality Assurance**

Certified reference materials have been used extensively as well as participation in proficiency tests .The results showed a good correlation between found and certified results.

## UNITED KINGDOM

**Estimated intake of cadmium:** data for 15 food categories. The most categories are: fruit & vegetables (37.24µg/week) cereals and bakery wares (35µg/week ). The sum of the cadmium intake of food categories is 85µg/week. The sum of the food groups intake is 12.1 µg/day. Fruit & vegetables (5.32µg /day) and cereals & bakery wares (5.00 µg /day) represent about 85% of the sum. Bread and potatoes each individually contribute 25% of total dietary exposure.

### **Analytical Quality Assurance**

Certified reference materials have been used extensively as well as participation in proficiency tests. The results showed a good correlation between found and certified results.

Regarding the intake for drinking water, it was calculated out of the intakes sum. Three countries present water intake data:FR (0.98 µg/week), DE (0.55 µg/week including the intake by mineral water) and PT (0 µg/week)

The values of the sum of cadmium intakes, for all countries range between 2.73 µg/week (IR, 2 food categories), and 176 µg/week (NL, 10 food categories).

Five countries have cadmium levels less than 85 µg/week (FI, FR, IR, SE, UK), while seven countries (BE, DK, DE, HE, IT, NO, PT) are in the range 110-141 µg Cd/week.

the Netherlands has the highest values (176µg Cd/week).

## **3.7 Comments on cadmium in the specific food groups**

All specific results are shown in tables 3.7 – 3.31

### **Table 3.7.Cadmium in Dairy products, excluding products of category 2: Milk (Cat. 1.1-1.5)**

No data for AU, DE, NO, PT, SP. The mean cadmium intake was in the range 0.05 µg/day (FR) - 0.40 µg/day (FI). HE and NL presented intake values referred to total dairy products (respectively 0.112 and 0.42 µg/day. BE, FR, HE, and IT presented high level intake in the range 0.1 µg/day (FR) – 0.393 µg/day (HE).

HE and NL: total milk and dairy products.

### **Table 3.8.Cadmium in Dairy products, excluding products of category 2: Cheese (Cat. 1.6)**

No data for AU, FI, HE, IR, NL, NO, PT. The mean cadmium intake was in the range 0 µg/day (DK) – 1.47 µg/day (IT). BE, FR, DE, IT presented high level intake in the range 0.07 µg/day (BE) - 1.49 µg/day (IT).

### **Table 3.9. Cadmium in Fats and oils**

No data for AU, BE,FI, HE, IR, NL, NO, SP, UK. The mean cadmium intake was in the range 0 µg/day (FR) - 0.123 µg/day (DE). FR, DE, IT PT presented high level intake in the range 0.012 µg/day (IT) – 0,88µg/day(PT).

### **Table 3.10 Cadmium in Edible ice (Cat. 3)**

Data only for BE with a mean cadmium intake of 1.05 µg/day.The high level intake value is 3.01 µg/day.

**Table 3.11. Cadmium in Fruit; Vegetables (incl. mushrooms & fungi, roots & tubers), and nuts & seeds. Excl. 3.2.11.1 and 3.2.11.2 of Regulation 466/2001**

No data for AU, BE, IR, SP. The mean cadmium intake was in the range 0.034 µg/day (FI) - 15.0 µg/day (IT). DK, DE, HE and NL presented intake value referred to total Vegetables + total Fruits. FR, DE, HE, IT and NO presented high level intake in the range 1.89 µg/day (NO) – 21.69 µg/day (DE).

**Table 3.12. Cadmium in 3.2.11.1 of Regulation 466/2001 (Leafy vegetables, fresh herbs, celeriac and all cultivated fungi)**

No data for AU, DK, DE, HE, IR, IT, SP, SE. The mean cadmium intake was in the range 0.04 µg/day (NO) – 1.05 µg/day (BE). BE, FR, NO and PT presented high level intake value respectively 3.01, 0.84 (excl. mushroom), 0.15, 10.56 µg/day.

**Table 3.13. Cadmium in 3.2.11.2 of Regulation 466/2001 (Stem vegetables, root vegetables and potatoes, excluding celeriac)**

No data for AU, DK, DE, HE, IR, IT, NL, SP. The mean cadmium intake was in the range 0.27 µg/day (UK) – 11.78 µg/day (PT). FI, NO, PT, SE and UK presented also values for potatoes, respectively: 1.727, 2.42, 11.78, 1.42, 0.27 µg/day. BE, FR, NO, PT and UK presented high level intake value respectively 13.43, 3.65, 6.20, 60.8, 0.63 µg/day

**Table 3.14. Cadmium in Confectionary (Cat. 5)**

No data for AU, BE, FR, HE, IR, IT, PT, SP, SE, UK. The mean cadmium intake was in the range 0.17 µg/day (NL) – 0.46 µg/day (DE). DE and NO presented high level intake value respectively 2.03 and 0.68 µg/day

**Table 3.15. Cadmium in Cereals and cereal products, incl. flours & starches from roots & tubers, pulses & legumes, excluding bakery (Cat. 6)**

No data for AU, BE, SP. DK, DE and SE presented intake values for Cereals & Bakery wares. The mean cadmium intake was in the range 0.30 µg/day (PT) – 8.25 µg/day (DK). DE, HE and NO presented high level intake value respectively 9.95, 5.31, 14.65 µg/day

**Table 3.16. Cadmium in Bakery Wares (Cat 7)**

No data for AU, DK, FI, FR, DE, HE, IR, IT, NO, SP, SE. The mean cadmium intake was in the range 0.085 µg/day (PT) – 4.57 µg/day (BE). BE presented the only high level intake value of 7.73 µg/day

**Table 3.17. Cadmium in Meat and meat products, including poultry and game (Cat. 8).**

No data for AU, IR, IT, SP. The mean cadmium intake was in the range 0.09 µg/day (FI) – 7.14 µg/day (NL). BE, DE, FR, HE and NO presented high level intake value respectively 6.00, 4.57, 1.2, 0.82, 3.42 µg/day

**Table 3.18. Cadmium in Horse meat (3.2.2- Reg 466/2002)**

Only BE and FR presented data, respectively 0.01 and 0.04 µg/day

**Table 3.19. Cadmium in Offals (CAT. 8)**

No data for AU, IR, IT, NL, NO, SP, SE. The mean cadmium intake was in the range 0.033 µg/day (PT) – 0.43 µg/day (HE). FR, DE, HE, NO presented high level intake value respectively 1.6, 1.83, 2.41, 1.67 µg/day

**Table 3.20. Cadmium in Fish and fish products, including molluscs, crustaceans and echinoderms (MCE) (Cat. 9)**

No data for AU, BE, SP. The mean cadmium intake was in the range 0.08 µg/day (FI) – 13.86 µg/day (HE). FR, DE, HE, IR, IT and NO presented high level intake value respectively 0.6, 0.897, 54,68, 0.94, 0.16, 0.57 µg/day

**Table 3.21. Cadmium in Bivalves molluscs (3.2.7 - Reg 466/2001)**

No data for AU, DK, ,IT, NL, SP, SE. The mean cadmium intake was in the range 0.01 µg/day (UK) – 1.54 µg/day (HE). BE, FR, DE, HE, NO presented high level intake value in the range 0 µg/day (BE) – 10.67 µg/day (HE).DE: Bivalves molluscs + crustaceans + squid

**Table 3.22. Cadmium in Cephalopodes (3.2.8-Reg. 466/2001)**

Data only for BE, HE and IR The mean cadmium intake was, 0.05 µg/day for BE, 0.56 µg/day for HE and. 0.002 µg/day for IR.  
HE presented the only high level intake value (3.85 µg/day).

**Table 3.23. Cadmium in Crustaceans: 3.2.6 (Reg. 466/2001)**

No data for AU, DK, DE, IT,NL, PT, SP, SE, UK. The mean cadmium intake was in the range 0.04 µg/day (BE) – 2.69 µg/day (NO). IR, BE, FR, HE and NO presented high level intake value respectively 0.86, 0.27, 1.2, 0.31, 5.69 µg/day

**Table 3.24. Cadmium in Eggs and eggs products (Cat.10)**

No data for AU, BE, HE, IR, IT, NL, PT, SP. The mean cadmium intake was in the range 0.001 µg/day (FI) – 0.005 µg/day (SE). FR, DE, and NO presented high level intake value respectively 0.1, 0.243 0.245, 0.21 µg/day

**Table 3.25. Cadmium in Sweeteners incl. honey (Cat 11)**

No data for AU, DK, HE, IR, IT, NL, PT, SP. The mean cadmium intake was in the range 0 µg/day (BE) 0.45 µg/day (UK). BE, FR, HE DE and NO presented high level intake value respectively 0.02, 0.2, 0.258, 0.04 µg/day

**Table 3.26. Cadmium in Salt, spices, soups, sauces, salads, protein products, etc (Cat 12)**

Data only for FR, DE and NL. The mean cadmium intake was, 0.43 µg/day for FR, 0.08 µg/day for DE and 1.17 µg/day for NL. FR and DE presented the only high level intake value (1.1 and 0.242 µg/day).

**Table 3.27. Cadmium in Non-alcoholic ("soft") beverages (Cat. 14.1)**

No data for AU, BE, HE, IR, , NL, PT, SP, SE, UK. DK presented the total beverages value. The mean cadmium intake was in the range 0.45 µg/day (NO ) – 1.85 µg/day (DK). FR DE and NO presented the high level intake value (respectively 1.7, 4.93 and 1.18 µg/day). 3 Countries

presented mean cadmium intake for water: FR: 0.14 µg/day, DE: 0.078 µg/day (including the intake of Cd by mineral water), and PT (mineral water): 0.165 µg/day,DK: total beverages.

FR and DE: escluded water. FR: 556.9 g/day-0.14µg/day. DE: 260 g/day-0.078µg/day(including the intake by mineral water)..

**Table 3.28. Cadmium in Alcoholic beverages, incl. alcohol-free and low-alcoholic counter (Cat. 14.2)**

No data for AU,BE, DK, FI, HE, IR, NL, SP, SE, UK. The mean cadmium intake was in the range 0.0094 µg/day (NO ) – 0.235 µg/day (DE). FR, DE, NO presented high level intake value respectively 0.2, 1.11, 0.04 µg/day). IT, DE: only wine. NO: only beer

**Table 3.29. Cadmium in Ready to eat (Cat 15)**

Only NL, NO and UK presented data, respectively 0.33 and 0.18 and 0.12 µg/day

**Table 3.30. Cadmium in composite foods (Cat 16)**

Only NL presented data: 0.99 µg/day

**Table 3.31. Cadmium in Potatoes**

Data for FI, NO, PT, SE, UK. The mean cadmium intake was in the range 3.0µg/day (UK), - 11.78 (PT)

**Table 3.7. Cadmium in Dairy products, excluding products of category 2: Milk (Cat. 1.1-1.5)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	238.36	674.73	0.0004	0.10	0.29	0.6
DENMARK	357		0.0010	0.35		2.2
FINLAND	419.5		0.001	0.400		4.0
FRANCE	158.1	410.7	0.000327	0.05	0.1	0.5
GREECE	112	393	0.001	0.112	0.393	0.58
IRELAND	310.62	660.84				
ITALY	130	162.8	<0.004	0.26	0.33	
The NETHERLANDS	407		0.001	0.42		2
SWEDEN	344		0.001	0.172		2.7
U. K.	281		0.0002	0.06		<1



**Table 3.8 Cadmium in Dairy products, excluding products of category 2: Cheese (Cat. 1.6)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	28.22	71.69	0.0009	0.03	0.07	0.2
DENMARK	33		0.0001	0		0
FRANCE	82.9	200	0.002	0.2	0.4	1.0
GERMANY	41.35	111.7	0.007-0.003	0.124	0.337	2.3
ITALY	43.6	43.9	0.034	1.47	1.49	
SWEDEN	28		0.001-0.004	0.055		0.9
U. K.*	60		0.001	0.07		<1

\* UK dairy produce

**Table 3.9 Cadmium in Fats and Oils (Cat. 2)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	48		0.0021	0.10		0.6
FRANCE	19.5	43.5	0.002	0	0.1	0.2
GERMANY	20.53	50.7	0.006	0.123	0.304	1.1
ITALY	19.8	20.5	<0.0012	0.012	0.012	
PORTUGAL	9.9	40	0.011	0.1089	0.88	
U.K.	27		0.003	0.07		<1

**Table 3.10 Cadmium in Edible ice (Cat. 3)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	23.38	66.98	0.045	1.05	3.01	6.5

**Table 3.11. Cadmium in Fruit, Vegetables incl. mushrooms & fungi, roots & tubers, and nuts & seeds; Excl. 3.2.11.1 and 3.2.11.2 of Regulation 466/2001**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	421			4.21		26.9
FINLAND	0.2		0.170	0.034		0.4
FRANCE**	243.0	567.9	0.012	2.95	6.90	27.8
FRANCE***	3.8	25	0.081	0.31	2.03	2.9
GERMANY	352.00	800.35	0.005-0.198	8.77	21.69	19.6
GREECE	23	81	0.0508	1.1684	4.1148	6.04
ITALY	254.2	308.6	0.059	15.0	18.27	74
the NETHERLANDS	360		0.026	9.49		38
NORWAY	76	246	0.0069	0.63	1.89	4.0
PORTUGAL	30.3		0.053	1.6059		
SWEDEN	29		<0.001-0.041	0.371		5.8
U. K.*	256		0.0120.0086	2.32		<20

\*UK fruit and vegetables excluding potatoes \*\* excluding mushrooms \*\*\* only mushrooms

**Table 3.12. Cadmium in 3.2.11.1 of Regulation 466/2001 (Leafy vegetables, fresh herbs, celeriac and all cultivated fungi)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	23.38	66.98	0.045	1.05	3.01	6.5
FINLAND	5.0		0.014	0.070		0
FRANCE*	23.6	78.6	0.035	0.84	2.8	7.9
NORWAY	4	15	0.01	0.04	0.15	0.3
PORTUGAL	12.63	80		0.76	10.56	
U. K.				0.14		1

\*excluding mushrooms

**Table 3.13. Cadmium in 3.2.11.2 of Regulation 466/2001 (Stem vegetables, root vegetables and potatoes, excluding celeriac)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	155.88	305.26	0.044	6.86	13.43	42.1
FINLAND	137.0			1.727		18.9
FRANCE	82.5	184.0	0.020	1.63	3.65	15.4
NORWAY	174	440	0.012	2.42	6.20	15.3
PORTUGAL	309.3	800	0.0381	11.78	60.8	
SWEDEN	142		0.010	1.42		22.3
U. K.	133.50	316.50	0.002	0.27	0.63	

**Table 3.14. Cadmium in Confectionary (Cat. 5)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	30		0.0100	0.30		1,9
FINLAND	0.20		0.17	0.34		0.4
GERMANY	5.86	28.6	0.071	0.416	2.03	0.3
ITALY						
the NETHERLANDS	52		0.003	0.17		1
NORWAY	10	38	0.018	0.18	0.684	1.1

**Table 3.15. Cadmium in Cereals and cereal products, incl. flours & starches from roots & tubers, pulses & legumes, excluding bakery (Cat. 6)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	217		0.0380	8.25		52.7
FINLAND	182.8		0.022-0.50	6.36		69.6
FRANCE	62.9	74-116	0.0038-0.021	1.69	2.8-2.4	15.9
GERMANY**	187.93	343.15	0.029	5.45	9.95	10.5
GREECE	23	91	0.0584	1.3432	5.3144	6.95
ITALY	66	89.2	0.036-0.07	3.41		
the NETHERLANDS	42		0.029	1.23		5
NORWAY	175	359	0.013-0.1.41	7.45	14.65	47.2
PORTUGAL	18.8		0.015-0.025	0.30		
SWEDEN	142		0.011-0.040	3.905		61.3
U. K.*	101		0.023	2.0		17

\*miscellaneous cereals. \*\*cereals and bakery wares

**Table 3.16. Cadmium in Bakery Wares (Cat 7)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	198.59	336.30	0.023	4.57	7.73	28.1
the NETHERLANDS	178		0.017	3.11		12
PORTUGAL	5,7		0,015	0,0855		
U. K.*	108		0,028	3.0		25

\*bread

**Table 3.17. Cadmium in Meat and meat products, including poultry and game (Cat. 8).**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	137.03	249.93	0.024	3.29	6.00	20.2
DENMARK	136		0.0022	0.29		1.9
FINLAND	71.3		0.001-0.004	0.09		1.1
FRANCE	147.7	287.1	0.004	0.62	1.2	5.9
GERMANY	174.98	389.4	0.007-0.016	2.072	4.57	9.7
GREECE	37	111	0.0074	0.2738	0.8214	1.42
the NETHERLAND	143		0.050	7.14		28
NORWAY	49	115	0.046	0.748	3.417	4.7
SWEDEN	101		<0.002-0.043	0.35		5.5
U. K.	88		0.0046	0.53		<6

**Table 3.18. Cadmium in Horse meat (3.2.2- Reg 466/2002)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	0.22	0	0.041	0.01	0	0.1
FRANCE	0.7	0	0.056	0.04	0	0.4

**Table 3.19. Cadmium in Offals (Cat. 8)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	0.32	0	0.068-0.153	0.02		0.2
FINLAND	3.0		0.035	0.105		1.1
FRANCE*	2.7	18.6	0.087	0.24	1.6	2.2
GERMANY	1.95	17.9	0.102	0.199	1.826	0.11
GREECE	1.6	8.9	0.2711	0.43376	2.41279	2.24
NORWAY	2	11	1.455	0.07	1.67	11.0
PORTUGAL	2.18		0.015	0.033		
U. K.	1		0.077	0.08		<1

\*only edible offal liver

**Table 3.20 cadmium in Fish and fish products, including molluscs, crustaceans and echinoderms (MCE) (Cat. 9)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	23		0.0124	0.29		1.9
FINLAND	53		0.006	0.32		3,4
FRANCE*	29.8	87.1	0.007	0.2	0.6	1.9
GERMANY	16.9	63.4	0.011-0.116	0.268	0.897	0.94
GREECE	36	142	0.3021-0.468	13.86	54.677	71.69
IRELAND	23	75	0.03	0.38	0.94	
ITALY	31.8	48.3	0.0033	0.105	0.159	
the NETHERLANDS	10		0.010	0.10		0
NORWAY	61.3	181.0	0.001-0.05	0.1618	0.5677	0.9
PORTUGAL	40.5		0.005	0.2035		
SWEDEN	21.5		0.004-0.034	0.096		1.5
U. K.	14		0.013	0.18		2

\*excluding molluscs

**Table 3.21. Cadmium in Bivalves molluscs (3.2.7 - Reg 466/2001)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	0.61	0	0.403	0.25	0	1.5
FINLAND	0.2		0.077	0.015		0.2
FRANCE	2.0	13.9	0.239	0.48	3.3	4.5
GERMANY	0.78	1.9	0.116	0.090	0.220	0.04
GREECE	2.6	18	0.593	1.5418	10.674	7,97
IRELAND	0.084	0	0.25	0.02	0	
NORWAY	1	5	0.718	0.714	3.59	4.5
PORTUGAL	10.1		0.1043	1.05343		
U. K.				0.01		<1

**Table 3.22. Cadmium in Cephalopodes (3.2.8-Reg. 466/2001)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	0.04	0	1.20	0.05	0	0.3
GREECE	2.6	18	0.214	0.5564	3.852	2.88
IRELAND	0.009	0	0.25	0.002	0	

**Table 3.23. Cadmium in Crustaceans: (3.2.6 Reg. 466/2001)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	1.83	12.75	0.021	0.04	0.27	0.2
FINLAND	1.4		0.10	0.140		1.5
FRANCE*	2.3	14.3	0.087	0.2	1.2	1.9
GREECE	2.6	18	0.017	0.0442	0.306	0.23
IRELAND	0.56	2.3	0.11	0.3	0.86	
NORWAY	10	32	0.045-1.125	2.688	5.688	17.1

\* and echinoderms

**Table 3.24. Cadmium in Eggs and egg products (Cat.10)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	21		0,0003	0.01		0
FINLAND	1.1		0.001	0.001		0
FRANCE	20.0	62.9	0.001	0.02	0.1	0.2
GERMANY	33.42	81	0.003	0.10	0.243	1.9
ITALY	13.8	18.3				
NORWAY	17	42	0.005	0.085	0.21	0.5
SWEDEN	15		<0.0007	0.005		0.1
U. K.	14		0.0004	0.01		<1

**Table 3.25 Cadmium in Sweeteners including honey (Cat 11)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	0.37	2.14	0.009	0	0.02	0
FINLAND	1.1		0.002	0.002		0
FRANCE	15.9	49.7	0.003	0.05	0.2	0.51
GERMANY	13	54.1	0.002-0.007	0.061	0.258	0.72
NORWAY	6	30	0.007	0.007	0.042	0
SWEDEN	0.6		<0.002	0.001		0
U. K.*	63		0.007	0.45		4

\* sugar and preserves

**Table 3.26 Cadmium in Salts, spices, soups, sauces, salads, protein products, etc (Cat 12)**

Member State	Consumption (g/day)		Mean level in food ( $\mu\text{g/g}$ )	Intake ( $\mu\text{g/day}$ )		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
FRANCE*	9.3	23.3	0.046	0.43	1.1	4.1
GERMANY	2.26	6.0	0.023-0.068	0.080	0.242	0.13
the NETHERLANDS	79		0.015	1.17		5

\* excluding soups

**Table 3.27. Cadmium in Non-alcoholic ("soft") beverages (Cat. 14.1)**

Member State	Consumption (g/day)		Mean level in food ( $\mu\text{g/g}$ )	Intake ( $\mu\text{g/day}$ )		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	2003		0.0009	1.85		11.8
FINLAND	476		0	0.095		1.0
FRANCE	373.8	962.9	0.00174	0.65	1.7	6.1
GERMANY	68.89	290	0.017-0.064	1.276	4.93	3.8
ITALY	83.7	148.6				
NORWAY	599	1840	0.00005-0.0001	0.45	1.18	2.8
U.K.	937		0.0002	0.19		2

**Table 3.28. Cadmium in Alcoholic beverages, incl. alcohol-free and low-alcoholic counterparts (Cat. 14.2)**

Member State	Consumption (g/day)		Mean level in food ( $\mu\text{g/g}$ )	Intake ( $\mu\text{g/day}$ )		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
FRANCE	159.9	628.6	0.00038	0.06	0.2	0.57
GERMANY*	46.95	222.2	0.005	0.235	1.111	2.6
ITALY	84	148.6				
NORWAY	94	399	0.0001	0.0094	0.0399	0.06
PORTUGAL	149.3		0.00075	0.112		

**Table 3.29. Cadmium in Ready to eat (Cat 15)**

Member State	Consumption (g/day)		Mean level in food ( $\mu\text{g/g}$ )	Intake ( $\mu\text{g/day}$ )		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
the NETHERLANDS	11		0.030	0.33		1
NORWAY	2	9	0.091	0.182	0.819	1.2
U. K.	2		0.059	0.12		1

**Table 3.30. Cadmium in composite foods (Cat 16)**

Member State	Consumption (g/day)		Mean level in food ( $\mu\text{g/g}$ )	Intake ( $\mu\text{g/day}$ )		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
the NETHERLANDS	282		0.004	0.99		

**Table 3.31. Cadmium in Potatoes (Cat. 4.2)**

Member State	Consumption (g/day)		Mean level in food ( $\mu\text{g/g}$ )	Intake ( $\mu\text{g/day}$ )		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
FINLAND	120		0.010	1.2		13.1
NORWAY	123	261	0.012	1.476	3.132	9.4
PORTUGAL	309.3	800	0.038	11.784	60.8	
SWEDEN	142		0.010	1.4		22.3
U. K.	123		0.026	3.00		25

### 3.8 Estimated daily intake of cadmium by other population groups

The UK is the only Member State that has complete intake studies for other population groups. The data from the UK and the available data from other Member States are presented in tables 3.32 – 3.35.

**Table 3.32. Cadmium. Daily Intake ( $\mu\text{g/day}$ ) by the Mean Adult Population. High Level**

Food group	BE	FR	DE	HE	NO	PT
Milk, milk products	0.29	0.1		0.39		
Condensed, powder milk, cheese, youghurt	0.07		0.33			
Fats and oils			0.30			0.88
Fruit and vegetables	16.44		21.66	4.11	8.39	93.2
Confectionary			2.03		0.68	
Cereals and bakery wares	7.73	5.2	9.95	5.31	14.65	
Fresh meat, poultry, game, processed	6.00	1.2	4.56	0.82	3.42	
Offal	0.00	1.6	1.83	2.41		
Fish and fish products		0.6	0.68	54.7	19.85	
Bivalves, crustacean and cefalopods	0.27	4.5	0.22	14.8		
Eggs		0.1	0.24		0.21	
Sweeteners	0.02	0.2	0.26		0.04	
Salts e spice		1.1	0.24			
Beverages		2.2	6.27		1.215	
Ready to eat					0.82	



**Table 3.33. Cadmium. Daily Intake (µg/day) by Consumers Only. Mean level.**

Food group	BE	FR	DE	HE	IT	NO	UK
Milk, milk products	0.10	0.06		0.19	0.33		0.05
Condensed, powder milk, cheese, youghurt	0.03		0.14		1.49		0.06
Fats and oils			0.12		0.01		0.04
Fruit and vegetables	8.06	7.29	10.76	1.78	18.3	3.35	5.45
Confectionary			0.94			0.23	0.13
Cereals and bakery wares	4.57	2.42	5.45	2.92	7.03	7.48	5.86
Fresh meat ,poultry, game, processed	4.33	1.95	2.23	0.41		17.0	0.75
Offal	3.26	1.55	1.47	7.86			1.36
Fish, total		0.26	0.33	31.6	0.16	6.1	0.44
Bivalves, crustacean and cefalopods	14.4	4.16	1.69	30.5			0.18
Eggs		0.03	0.103			0.085	0.01
Sweeteners	0.04	0.06	0.104			0.035	0.20
Salts e spice		0.45	0.084				
Beverages		0.90	5.33			0.57	0.13
Ready to eat						0.36	0.39
<b>Total consumer dietary exposure</b>							<b>14</b>

**Table 3.34. Cadmium. Daily Intake (µg/day) by Consumers Only. High level.**

Food group	BE	FR	DE	HE	NO	UK
Milk, milk products	0.29	0.14		0.43		0.12
Condensed, powder milk, cheese, youghurt	0.07		0.35			0.19
Fats and oils			0.30			0.11
Fruit and vegetables	16.54	16.99	25.59	4.775	8.66	11.02
Confectionary			3.04		0.70	0.49
Cereal and bakery wares	7.73	5.93	9.95	8.35	14.72	12.25
Fresh meat ,poultry, game, processed	6.00	3.3	4.88	0.98	45.07	2.01
Offal		3.50	3.75	21.15		4.72
Fish and fish products		0.64	0.84	73.16	20.63	1.28
Bivalves, crustacean and cefalopods	9.18	8.41	4.26	78.28		0.72
Eggs		0.08	0.245		0.21	0.03
Sweeteners	0.19	0.18	0.33		0.11	0.68
Salts e spice		1.10	0.25			
Beverages excl dairy prod.		1.68	16.25		1.26	0.33
Alcool. Beverage		0.28	1.5			
Ready to eat					1.18	1.58
<b>Total consumers dietary exposure</b>						<b>24.0</b>

\*excluding kidneys

**Table 3.35. Cadmium. Daily intake (µg/day) by children in different age groups.**

	Mean population. High level			Consumers only. Mean level			Consumers only. High level		
	3-14	4-6	10-12	3-14	4-6	10-12	3-14	4-6	10-12
<b>FOOD</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>
Milk, milk products									
Condensed, powder milk, cheese, yoghurt	0.18	0.19	0.21	0.09	0.07	0.08	0.18	0.21	0.23
Fats and oils		0.19	0.27		0.08	0.11		0.19	0.27
Fruits and vegetables	10.13	12.94	15.27	5.07	6.19	7.93	12.51	15.28	18.35
Confectionary		2.46	2.53		0.90	1.05		2.92	2.92
Cereals and bakery wares	5.53	6.53	9.04	1.43	3.76	5.14	5.86	6.53	9.04
Meat	0.90	2.39	3.38	1.61	1.05	1.63	3.0	2.39	3.38
Offal	1.0	0.7	1.59	1.18	0.95	1.39	2.5	2.37	3.64
Fish and fish products	0.39	0.32	0.42	0.18	0.17	0.24	0.42	0.45	0.61
Bivalve, crustaceans, cephalopods	2.32	∅	∅	3.28	0.85	1.19	10.15		
Eggs	0.05	0.155	0.175	0.02	0.07	0.08	0.06	0.16	0.17
Sweeteners	0.06	0.156	0.16	0.02	0.07	0.08	0.06	0.2	0.22
Salts and spices	0.84	0.18	0.19	0.33	0.06	0.07	0.89	0.19	0.2
Beverages	1.01	7.3*	8.26**	0.41	5.25***	4.22****	1.04	14.57 *****	8.47 *****

DE: \* excl. water (0.25µg/d); \*\* excl. water (0.11µg/d); \*\*\*excl. water (0.04µg/d); \*\*\*\*excl. water (0.106µg/d);  
\*\*\*\*\*excl. water (0.05µg/d); \*\*\*\*\*excl. water (0.16µg/d);

### 3.9 Occurrence summary table for cadmium

This table contains summaries of occurrence data that has been used in the intake calculation. It provides information on the mean concentration level, median levels where available and minimum and maximum values.

**Table 3.36**

**Cadmium. Occurrence summary data for individual food samples.**

**Unit: mg/kg**

Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>Belgium</b>								
1	dairy product 1	143			0.0004		< 0.0001	0.0330
2	dairy product 2	69			0.0009		< 0.0001	0.0043
3	Fat	2					< 0,340	
5	Vegetables 3.2.11	28					< 0.005	0.021
6	Vegetables 3.2.11.1	74			0.045		< 0,005	0.18
7	Vegetables 3.2.11.2	23			0.044		0.005	0.245
12	Meat 3.2.1	586			0.0240		< 0,001	0.4900
13	Horse meat 3.2.2	384			0.0410		< 0,005	0.7980
14	Liver 3.2.3	1365			0.0680		< 0,001	0.8780
15	Kidney 3.2.4	8			0.1530		0.1140	0.2890
16	fish 3.2.5	131					< 0,001	0.0270
17	fish 3.2.5.1	20					< 0,001	0.0100
18	fish 3.2.7	26			0.4030		< 0,001	0.9740
19	fish 3.2.8	10			1.2000		0.0800	1.9040
20	fish 3.2.6	33			0.0210		< 0,005	1.1410
22	Honey	31			0.009		< 0,005	0.057
23	paprika	1					0.0100	
24	Particular nutritional	6			0.094		< 0,005	0.351
<b>Denmark</b>								
	Dairy products	21	DK-001	1990	N.D.	N.D.	<0,00003	0.0006
	Fruits	420	DK-003	1993-97	0.0029	0.0016	<0,0005	0.0580
	Vegetables	487	DK-003	1993-97	0.0184	0.0122	<0,0004	0.2670
	Cereals	154	DK-003	1993-97	0.0332	0.0357	<0,001	0.1180
	Meat	566	DK-003	1993-97	0.0022	0.0010	<0,0003	0.013
	Fish	225	DK-003	1993-97	0.0034	0.0028	<0,001	0.0172
	Eggs	30	DK-003	1993-97	0.0006	N.D.	0.0006	0.0010
<b>Finland</b>								
1.1.1	milk	52	FI 003	1998	0,001		<0,001	0,001
4.2.1	potato	100	FI 101	2000	0,010		0,003	0,043
4.2.1	carrot	33	FI 102	1993	0,031		0,005	0,15
4.2.1	lettuce	28	FI 102	1993	0,013		0,005	0,068
4.2.1	Chinese cabbage	30	FI 102	1993	0,005		0,001	0,032
5.1	Cocoa powder	20	FI 104	2002	0,17		0,025	0,65
6.1	wheat	36	FI 112	1991	0,036		0,009	0,094
6.1	oats	59	FI 107	1999	0,056		0,012	0,53
6.1	rye	44	FI 107	2001	0,025		0,004	0,077
6.3	Muesli products	30	FI 103	1998	0,022		0,003	0,069
8.1	Meat, reindeer	7	FI 103	1998	0,003		0,001	0,009
8.1	Meat, bovine	30	FI 006	1998	0,001		<0,001	0,002
8.1	Meat, pig	33	FI 006	2001	0,002		<0,001	0,010

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Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>Finland cont.</b>								
8.1	Meat, sheep	3	FI 005	2000	0.001		0.001	0.002
8.1	Meat, horse	2	FI 005	2000	0.024		0.016	0.032
8.4	Liver, bovine	31	FI 006	2001	0.034		0.013	0.122
8.4	Liver, pig	34	FI 006	2001	0.029		0.008	0.173
8.4	Liver, elk	11	FI 005	2000	0.656		0.309	1.57
8.4	Liver, poultry	13	FI 005	2000	0.011		0.005	0.020
8.4	Kidney, bovine	30	FI 006	2001	0.179		0.065	0.446
8.4	Kidney, pig	30	FI 006	2001	0.162		0.065	0.361
8.4	Kidney, elk	49	FI 006	2001	6.03		0.633	21.3
9.1.1	pike	10	FI 007	2002	0.001		0.001	0.002
9.1.1	perch	15	FI 007	2002	0.002		0.001	0.007
9.1.1	Pike perch	10	FI 007	2002	0.001		<0.001	0.002
9.1.1	bream	4	FI 007	2002	0.003		0.001	0.006
9.1.1	salmon	8	FI 007	2002	0.001		0.001	0.001
9.1.1	vendace	7	FI 007	2002	0.008		0.003	0.024
9.1.1	burbot	7	FI 007	2002	0.001		<0.001	0.001
9.1.1	powan	3	FI 007	2002	0.005		0.005	0.005
9.1.1	Baltic herring	32	FI 007	2002	0.009		0.003	0.019
9.1.2.1	mussels	5	FI 104	2002	0.077		0.054	0.091
9.1.4.3	shrimp	6	FI 104	2002	0.010		0.002	0.035
9.4	Canned tuna	14	FI 104	2002	0.029		0.005	0.064
10.1	egg	30	FI 002	1997	0.001		0.001	0.003
11.3	honey	10	FI 004	1999	0.002		0.001	0.005
14.1.5	Ground coffee (drink)	14	FI 106	1994	0.005		0.003	0.0011
<b>France</b>								
1	Dairy products	184	FR 004	2000	3.27E-04		< 7.5E-06	1.86E-03
5	Fruits and vegetables	382	FR 006	2000-2001	0.012		< 0.00025	0.245
6	Fruits and vegetables (a) excl. Mushrooms	125	FR 006	2000-2001	0.035		< 0.001	0.320
6 bis	Mushrooms	79	FR 006	2000-2001	0.081		0.002	0.480
7	Fruits and vegetables (b)	158	FR 006	2000-2001	0.020		< 0.0005	0.140
9	Cereals and cereal products	89	FR 006	2000-2001	0.038		0.0005	0.498
10	Cereals and cereal products cat.2	7	FR 006	2000-2001	0.021		0.003	0.050
12	Meat and meat products	5564	FR 004	2000-2001	0.004		< 0.00007	0.137
13	Horsemeat	468	FR 004	2000-2001	0.056		< 0.0005	0.566
14	Edible offal, liver	5987	FR 004	2000-2001	0.087		< 0.0005	2.75
15&16	Fish and fish products	891	FR 004	2000-2001	0.007		< 0.00025	0.080
18	Molluscs	145	FR 004	2000	0.239		< 0.0005	3.45
20	Crustaceans	7	FR 006	2000-2001	0.087		0.045	0.230
21	Eggs and egg products	300	FR 004	2000	0.0012		< 0.00001	0.014
22	Sweeteners, incl. honey	314	FR 004 + 006	2000-2001	0.003		< 0.0007	0.074
23	Salts, spices, sauces, excl. Soups	172	FR 006	2000-2001	0.046		< 0.00008	0.493
25	Waters	77	FR 006	2000-2001	< 0.00025		< 0.00025	< 0.00025
25 bis	Non alcoholic beverages	143	FR 006	2000-2001	0.00174		< 0.00005	0.200
26	Alcoholic beverages	263	FR 006	2000-2001	0.00038		< 0.00003	0.0058
<b>Germany</b>								
1.1 and 1.3	milk	151		1997-2002	0.006		<0.0006	0.21
1.5	milk powder	52		1998-2001	0.007		<0.002	0.023
1.6	cheese	297		1997-2001	0.003		<0.0004	0.018
2	oil	56		1998-2002	0.006		<0.002	0.023
4.1	fruits	1894		1997-2002	0.005		<0.0002	0.214

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Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>Germany cont.</b>								
4.1.2.2	dried fruits	95		1997-2001	0.01		<0.0004	0.07
4.2	nuts and seeds	1712		1997-2002	0.198		<0.0004	1.96
4.2	vegetable	3505		1997-2002	0.029		<0.0002	4.23
4.2	fungi	310		1997-2002	0.052		<0.001	1.38
4.2.2.2	dried vegetables	55		2000-2001	0.269		<0.01	1.05
4.2.2.2	dried fungi	64		1998-2002	0.396		<0.005	2.04
4.2.2.2	dried algae	11		2000-2002	0.73		0.069	3.3
4.2.2.6	concentrated tomato	61		1999-2001	0.04		0.006	0.102
5.1	cocoa products	474		1997-2002	0.071		<0.0017	2.32
6 and 7	cereals, cereal products, bakery wares	1462		1997-2002	0.029		<0.001	0.861
8.1	fresh meat	1211		1997-2002	0.016		<0.0004	0.787
8.1	game	383		1997-2001	0.005		<0.0006	0.121
8.4	offal	3089		1997-2002	0.102		0.002	2.9
8.5, 8.3 and 8.2	processed meat	328		1997-2002	0.007		<0.0006	0.055
9.1 without 9.1.2 to 9.1.4	fish	2778		1997-2002	0.011		<0.0006	0.834
9.1.2 to 9.1.4	bivalves, crustaceans, squids	718		1997-2002	0.116		<0.0006	4.8
10.1	eggs	46		1997-2000	0.003		<0.0004	0.027
11.1	sugar	22		1998-2001	0.004		<0.001	0.006
11.3	honey	133		1997-2002	0.007		<0.0004	0.059
11.4	sweeteners	32		1998-2000	0.002		<0.002	0.009
12.1	salt	13		1998-2002	0.023		<0.005	0.062
12.2	herbs and spices	484		1997-2002	0.068		<0.0004	1.01
13.1 and 13.2	infant food	1276		1997-2002	0.005		<0.001	0.62
13.4 and 13.5	dietetic food	175		1997-2002	0.088		<0.002	5.9
13.6	food supplements	44		1998-2002	0.193		<0.0008	1.4
14.1.1	water	2991		1997-2002	0.0003		<0.0001	0.003
14.1.2 and 14.1.3	vegetal juice	28		1997-2002	0.064		<0.005	0.266
14.1.2 and 14.1.3	fruit juice	197		1998-2002	0.017		<0.0004	0.122
14.1.5	tea and coffee	417		1997-2002	0.055		<0.0001	0.61
14.2.1	beer	126		1999-2002	0.001		<0.0004	0.005
14.2.3	wine	442		1997-2002	0.005		<0.0001	0.23
<b>Greece</b>								
1.1.1	Milk and butter milk	95		2001-2002	0.0010		0.0002	0.0120
4.2.2	Processed vegetables, nuts, seeds	4		1999-2000	0.0677	<0.002	<0.002	0.2000
6.1	Whole, broken or flaked grain	5		2001-2002	0.0584		0.0180	0.1800
8.1.1+8.3.1	Fresh & processed comminuted meat	50		1999-2002	0.0074		< 0.002	0.0510
8.4	Offals	93		1999-2002	0.2711		0.0043	2.8660
9.1.1	Fresh fish Muscle meat of fish	14		1999-2000	0.0756		0.0013	0.9000
9.1.1.13	bass	4		2000	0.0072	0.0130	0.0130	0.0130
9.1.1.28	swordfish	3		2000-2002	0.0131		0.0013	0.0190
9.1.1.30X1	Chrysophrys auratus	48		1999-2002	0.0059		0.0013	0.0350
9.1.1.30X2	Common Pantora	1		2000	0.0640	0.0640	0.0640	0.0640
9.1.1.30X3	bogue	5		1999-2001	0.0185		0.0043	0.0250
9.1.1.30X5	Cuttlefish	3		2001	0.4190	0.0380	0.0090	1.2110

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Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>Greece cont.</b>								
9.1.1.30 X6	Perch	5		2001	0.0010		<0.002	0.0020
9.1.1.30 X7	Seabream	3		2001	0.0090	0.0080	<0.002	0.0180
9.1.1.30 X8	Small fish eaten whole	10		2001	0.0386	0.0250	0.0190	0.1440
9.1.1.5	Grey mullet	3		2002	0.0567	0.0500	0.0500	0.0700
9.1.2	Fresh bivalve molluscs	14		2000-2002	0.1826		0.0220	0.4564
9.1.2.1	mussels	57		1999-2002	0.6957		0.0479	2.4500
9.1.2.2	Oysters	1		2002	0.4920	0.4920	0.4920	0.4920
9.1.3	Fresh cephalopodes	2		2001	0.0022		<0.002	0.0042
9.1.3.1	Squid	2		2001	0.3860	0.3860	0.0580	0.7150
9.1.3.2	Octopus	37		1999-2001	0.1556		< 0.002	1.3000
9.1.3.3	Cattle-fish	10		1999-2000	0.4360		0.0500	1.3000
9.1.4.2	Lobsters	1		2000	0.0045	0.0045	0.0045	0.0045
9.1.4.3	Shrimp	3		1999-2000	0.0210		0.0200	0.0400
9.2.1+9.2.2	Frozen fish	458		1999-2002	0.1606		0.0005	6.2300
9.4	Fully preserved fish	188		1999-2002	0.2950		< 0.002	
9.4.1	Fish canned in oil	180		1999-2002	0.7355		<0.002	8.5600
9.4.2	Fish canned in brine	105		1998-2002	0.2028		<0.002	1.5000
9.4.3	Fermented fish	271		1998-2002	0.6604		<0.002	5.9200
9.4.4.X1	Smoked hering	3		2000-2002	0.0640		0.0640	0.0640
<b>Ireland</b>								
	Milk	3		1999	0.005		0.0050	0.0050
	acid casein powder	43		1995/1996	0.0025		<0.005	<0.005
	rennet casein powder	33		1995/1996	0.0025		<0.005	<0.005
	skim milk powder	71		1995/1996	0.0025		<0.005	<0.005
	FLOUR	2		1999	0.0500		0.0500	0.0500
	Beef	87		2000-2001	0.004		<0.002	<0.02
	Lamb	7		2000-2001	0.001		<0.002	<0.002
	Poultry	25		2000-2001	0.01		<0.002	<0.02
	BEEFKIDNEY	3		2000-2001	0.1933		0.0500	0.4200
	KIDNEY	5		2000-2001	0.1220		0.0800	0.2100
	LAMBSKIDNEY	7		2000-2001	0.1814		0.0500	0.6300
	LAMBSLIVER	8		2000-2001	0.0813		0.0500	0.1200
	LIVER	1		2000-2001	0.1500		0.1500	0.1500
	Pate	1		2000-2001	0.1200		0.1200	0.1200
	PORKKIDNEY	2		2000-2001	0.2200		0.2100	0.2300
	PORKLIVER	4		2000-2001	0.0850		0.0600	0.1300
	ANCHOVIES	2		2000-2001	0.2400		0.1500	0.3300
	C.Gigas	549		1996-2001	0.3325		0.0980	0.6310
	Cod	130		1996-2001	0.0035		0.0040	0.0090
	Crab	4		1996-2001	2.5425		0.1700	4.6000
	haddock	70		1996-2001	0.0023		0.0040	0.0040
	hake	10		1996-2001	0.0030		<0.006	<0.006
	herring	10		1996-2001	0.0020		<0.004	<0.004
	lemon sole	20		1996-2001	0.0020		<0.004	<0.004
	ling	10		1996-2001	0.0020		<0.004	<0.004
	M.edulis	2150		1996-2001	0.1662		0.0500	0.4400
	Mackerel	40		1996-2001	0.0043		0.0040	0.0060
	monk/angler fish	20		1996-2001	0.0020		<0.004	<0.004
	O.edulis	275		1996-2001	0.4291		0.2600	0.5900
	OYSTERS	1		1996-2001	0.2470		0.2470	0.2470
	plaice	116		1996-2001	0.0023		<0.004	<0.006
	prawns	51		1996-2001	0.0340		0.0080	0.0800
	Saithe	5		1996-2001	0.0020		<0.004	0.0140

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Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>Ireland cont.</b>								
	salmon	313		1996-2001	0.0044		0.0100	0.0300
	SHRIMPS	1		1996-2001	0.2400		0.2400	0.2400
	Trout	50		1996-2001	0.0045		<0.004	<0.01
	whiting	10		1996-2001	0.0020		<0.004	<0.004
	FROZEN PRAWNS	1		2000-2001	0.1100		0.1100	0.1100
	prawns	1		2000-2001	0.2600		0.2600	0.2600
	Smoked fish	1		2000-2001	0.0700		0.0700	0.0700
	SMOKEDOYSTERS	1		2000-2001	0.6500		0.6500	0.6500
	Allspice	1		2000-2001	0.0800		0.0800	0.0800
	Chilli Powder	1		2000-2001	0.0800		0.0800	0.0800
	Chinese 5 Spice	1		2000-2001	0.2400		0.2400	0.2400
	Cinnamon	7		2000-2001	0.2329		0.0700	0.3300
	Coriander	1		2000-2001	0.1800		0.1800	0.1800
	Curry Powder	4		2000-2001	0.0900		0.0500	0.1300
	Dill	1		2000-2001	0.3700		0.3700	0.3700
	Dried Parsley	1		2000-2001	0.1000		0.1000	0.1000
	Dried Rosemary	1		2000-2001	0.0700		0.0700	0.0700
	Dried Thyme	1		2000-2001	0.0800		0.0800	0.0800
	Ginger	2		2000-2001	0.1400		0.0700	0.2100
	Ground Corriander	1		2000-2001	0.0800		0.0800	0.0800
	Ground Ginger	1		2000-2001	0.1100		0.1100	0.1100
	Ground Paprika	1		2000-2001	0.0700		0.0700	0.0700
	Mixed Herbs	17		2000-2001	0.1400		0.0600	0.4800
	Mixed Spice	9		2000-2001	0.2122		0.0600	0.2800
	Mixed Spices	1		2000-2001	0.0700		0.0700	0.0700
	Nutmeg	3		2000-2001	0.2167		0.1900	0.2500
	Oregano	1		2000-2001	0.0800		0.0800	0.0800
	Organic Spice	1		2000-2001	0.0700		0.0700	0.0700
	Organic Whole Mace	1		2000-2001	0.0900		0.0900	0.0900
	Paprika	5		2000-2001	0.1120		0.0700	0.1800
	Parsley	8		2000-2001	0.1163		0.0600	0.1600
	Seasoning	1		2000-2001	0.0500		0.0500	0.0500
	Thai Spice	2		2000-2001	0.0650		0.0600	0.0700
	Thyme	9		2000-2001	0.1633		0.0500	0.5700
	Tumeric	1		2000-2001	0.0800		0.0800	0.0800
	MUSTARD	10		2000-2001	0.0830		0.0500	0.2600
	Sauce	1		2000-2001	0.0900		0.0900	0.0900
	MUSSELSALAD	1		2000-2001	0.1100		0.1100	0.1100
	SOYA BASED INFANT FORMULA	2		2000-2001	0.0650		0.0600	0.0700
	CHILLINUTS	1		2000-2001	0.0900		0.0900	0.0900
	Colouring	1		2000-2001	0.0050		0.0050	0.0050
	MILK	3		2000-2001	0.0050		0.0050	0.0050
	Barley Drink	1		2000-2001	0.0900		0.0900	0.0900
	BOTTLEDWATER	27		2000-2001	0.0005		0.0005	0.0005
	Coffee	2		2000-2001	0.0700		0.0700	0.0700
	Coffee - decaff	2		2000-2001	0.0700		0.0700	0.0700
	Coffee (instant) organic	1		2000-2001	0.0700		0.0700	0.0700
	FRUITDRINK	1		2000-2001	0.0050		0.0050	0.0050
	Tea	6		2000-2001	0.1233		0.0500	0.2100
	Tea (herbal)	3		2000-2001	0.1067		0.0700	0.1500
	WATER	7		2000-2001	0.0005		0.0005	0.0005
	CIDER	2		2000-2001	0.0175		0.0050	0.0300
	APPLES	4		2000-2001	0.2025		0.1200	0.3500
	GOOSEBERRIES	1		2000-2001	0.0130		0.0130	0.0130

SCOOP 3.2.11 – Intake of As, Cd, Pb and Hg

Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>Ireland cont.</b>								
	RHUBARB	3		2000-2001	0.0870		0.0220	0.2000
	CABBAGE	13		2000-2001	0.0862		0.0200	0.1790
	CARROTS	3		2000-2001	0.1200		0.0600	0.1700
	LETTUCE	9		2000-2001	0.1514		0.0260	0.4400
	ONIONS	10		2000-2001	0.1288		0.0200	0.6600
	PARSNIP	2		2000-2001	0.0750		0.0500	0.1000
	Pesto Genovese Mill	1		2000-2001	0.0900		0.0900	0.0900
	POTATOES	13		2000-2001	0.0686		0.0150	0.1600
	SPINACH	2		2000-2001	0.5500		0.3300	0.7700
	SPRING ONIONS	1		2000-2001	0.0900		0.0900	0.0900
	TOMATO POWDER	2		2000-2001	0.1450		0.1300	0.1600
	TOMATOES	1		2000-2001	0.0700		0.0700	0.0700
	Pate	1		2000-2001	0.1000		0.1000	0.1000
	TINNED CRAB MEAT	1		2000-2001	0.1600		0.1600	0.1600
	TINNED CRABMEAT	1		2000-2001	0.1100		0.1100	0.1100
<i>Note: Table does not include all occurrence data (excluded are not quantified data and data from highly contaminated areas. For these please see main table in the Annex.</i>								
<b>Italy</b>								
9.1.2.1	Mussel	30	IT-003	1995	0,10			
6.1	Durum wheat grain	239	IT-007/IT-008	1996	0,037		0,009	0,076
6.1	Soft wheat grain	178	IT-007/IT-008	1996	0,035		0,011	0,081
8.1.1	Horse muscle	62	IT-009	1996	0,075		0,003	0,490
14.2.3	White and red wines	60	IT-010	1996-98	<0,003		<0,003	0,006
9.1.3.2	Spider octopus	300	IT-011	1997	0,40		0,14	1,04
9.1.3.1	Broadtail squid	212	IT-011	1997	0,07		0,04	0,10
1.1.1	Cow milk	10	IT-012	1997	<0,004		<0,004	<0,004
13.1	Powdered milks for infants	18	IT-012	1997	<0,004		<0,004	0,007
6.4	Pasta	19	IT-013	1997-98	0,05		0,02	0,09
6.2	Wheat flour "0" type	2	IT-013	1997-98	0,03		0,02	0,04
7.1.1	Bread "0" type	2	IT-013	1997-98	0,04		0,03	0,05
4.2.1	Lettuce	13	IT-013	1997-98	0,03		0,01	0,06
4.2.1	Endive	5	IT-013	1997-98	0,03		<0,01	0,05
4.2.1	Celery	5	IT-013	1997-98	0,09		0,06	0,19
4.2.1	Spinach	5	IT-013	1997-98	0,16		0,09	0,29
4.2.1	Guinea pepper	13	IT-013	1997-98	0,03		0,02	0,05
4.2.1	Tomato	15	IT-013	1997-98	0,05		0,02	0,09
4.2.2.4	Canned tomatoes (peeled & sauce)	4	IT-013	1997-98	0,06		0,03	0,09
4.1.2.5	Fruit jam	4	IT-013	1997-98	<0,01		<0,01	0,03
4.2.2	Roasted pistachio	4	IT-013	1997-98	0,11		0,10	0,12
1.6.2	Pecorino (ewes' milk cheese)	7	IT-014	1998	0,025			
1.6.6	Ricotta (ewes' milk cheese)	7	IT-014	1998	0,043			
11.3	Honey	50	IT-005	1999	0,0009		<0,0004	0,0052
9.1.2.3	Striped venus	1260	IT-015	1999	0,09		0,07	0,12
2.1.2	Olive oil	4	IT-016	2000-2001	<0,0012		<0,0012	<0,0012
6.4	Pasta	11	IT-006	2002	0,047	0,036	0,020	0,092
6.1	Rice	42	IT 22	1997-2002	0,07		<0,002	0,36
9.1	Fresh Fish	90	IT-023	2001	0,0033		<0,00025	0,0077
9.1.3	Fresh cephalopodes	42	IT-023	2001	0,0021		0,0009	0,198
9.1.2	Fresh bivalve molluscs	30	IT-023	2001	0,091		0,028	0,366
<b>the Netherlands</b>								
	potatoes	69	NL/002	1997	0,022	0,017	0,007	0,082
	potatoes	7	NL/002	2002	0,018	0,02	0,007	0,033
	potatoe-dish	4	NL/002	1997	0,015	0,015	0,01	0,02
	strawberry	6	NL/002	2002	0,006	0,005	0,002	0,012
	endive	1	NL/002	1999	0,025			



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<b>the Netherlands cont.</b>								
	endive	1	NL/002	2001	0,042			
	endive	4	NL/002	2002	0,034	0,034	0,021	0,046
	anise	1	NL/002	1997	0,15			
	anchovy	4	NL/002	1998	0,353	0,382	0,075	0,572
	anchovy	3	NL/002	1999	0,17	0,183	0,041	0,287
	anchovy	24	NL/002	2001	0,077	0,05	0,005	0,38
	vinegar	49	NL/002	1997	0,05			
	special herbs- and mixtures	5	NL/002	1997	0,116	0,14	0,04	0,15
	cauliflower	1	NL/002	1997	0,01			
	cauliflower	1	NL/002	1998	0,26			
	cauliflower	1	NL/002	1999	0,013			
	cauliflower	15	NL/002	2001	0,02	0,024	0,005	0,032
	cauliflower	4	NL/002	2002	0,025	0,02	0,005	0,053
	onion	1	NL/002	2002	0,002			
	flounder	22	NL/002	1999	0,005	0,005	0,005	0,02
	cayenne, chilipowder	2	NL/002	1997	0,31	0,31	0,03	0,59
	mushrooms	2	NL/002	1998	0,016	0,016	0,005	0,03
	tuber	1	NL/002	1997	0,01			
	green pea	1	NL/002	1997	0,01			
	drinking water	15	NL/002	1997 april	0,00005	0,00005	0,00005	0,00005
	drinking water	27	NL/002	1997 mei	0,0005	0,0005	0,0005	0,0037
	drinking water	14	NL/002	1998 mei	0,0005	0,0005	0,0005	0,001
	drinking water	13	NL/002	1998 juni	0,0005	0,0005	0,0005	0,0005
	pigeon	1	NL/002	2001	0,02			
	pigeon	1	NL/002	1998	0,009			
	duck	2	NL/002	1997	0,006	0,006	0,005	0,012
	duck	2	NL/002	1998	0,135	0,135	0,005	0,265
	duck	4	NL/002	2001	0,005	0,005	0,005	0,005
	pheasant	1	NL/002	1997	0,01			
	pheasant	5	NL/002	2001	0,005	0,005	0,005	0,005
	mace	1	NL/002	1997	0,06			
	trout	1	NL/002	1999	0,02			
	shrimp	14	NL/002	1999	0,024	0,025	0,005	0,07
	mixed vegetables	1	NL/002	1998	0,008			
	mixed spices	3	NL/002	1997	0,073	0,06	0,06	0,1
	green coal	2	NL/002	1997	0,01	0,01	0,01	0,01
	green coal	1	NL/002	1998	0,08			
	shark	1	NL/002	1999	0,02			
	hare	3	NL/002	1997	0,004	0,001	0,005	0,011
	hare	14	NL/002	2001	0,019	0,02	0,005	0,04
	herring	1	NL/002	1998	0,005			
	herring	3	NL/002	1999	0,049	0,049	0,044	0,055
	herring	8	NL/002	2001	0,02	0,02	0,01	0,04
	hake	1	NL/002	1999	0,005			
	deer	2	NL/002	1997	0,001	0,001	0,001	0,001
	deer	15	NL/002	2001	0,012	0,01	0,005	0,05
	ice berg lettuce	1	NL/002	2002	0,008			
	cuttle fish	1	NL/002	1998	2,52			
	cuttle fish	19	NL/002	1999	0,153	0,17	0,02	0,26
	cuttle fish	6	NL/002	2001	0,585	0,39	0,09	1,591
	hard cheese	2	NL/002	2000	0,0125	0,0125	0,0125	0,0125
	codfish	9	NL/002	1999	0,005	0,005	0,005	0,005
	cinnamon	4	NL/002	1997	0,13	0,105	0,08	0,23
	chestnut	1	NL/002	1998	0,01			

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Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>the Netherlands cont.</b>								
	curry	2	NL/002	1997	0.065	0.065	0.03	0.1
	chicken	7	NL/002	1998	0.013	0.011	0.005	0.024
	rooted celery	1	NL/002	1997	0.01			
	rooted celery	1	NL/002	1998	0.51			
	cockle	15	NL/002	1999	0.024	0.02	0.005	0.08
	cummin	1	NL/002	1997	0.06			
	cucumber	1	NL/002	2002	0.002			
	rabbit	12	NL/002	2001	0.01	0.005	0.005	0.03
	crab	1	NL/002	1997	0.028			
	crab	2	NL/002	1999	0.075	0.075	0.02	0.13
	crab	3	NL/002	2000	0.1	0.1	0.1	0.1
	crab	3	NL/002	2001	0.083	0.06	0.05	0.14
	lobster	1	NL/002	1999	0.02			
	red beetroot	1	NL/002	1997	0.01			
	red beetroot	2	NL/002	2002	0.14	0.014	0.013	0.014
	lettuce	9	NL/002	2002	0.036	0.031	0.016	0.087
	clove	1	NL/002	1997	0.02			
	crinkly lettuce	1	NL/002	2002	0.069			
	koenjit	1	NL/002	1997	0.16			
	lollo bianco	1	NL/002	2002	0.031			
	mackerel	3	NL/002	1998	0.01	0.008	0.005	0.02
	mackerel	9	NL/002	1999	0.008	0.01	0.005	0.02
	mackerel	6	NL/002	2001	0.017	0.015	0.01	0.03
	mussels	1	NL/002	1998	0.793			
	mussels	47	NL/002	1999	0.079	0.06	0.04	0.31
	nutmeg	1	NL/002	1997	0.03			
	oysters	11	NL/002	1999	0.131	0.08	0.06	0.62
	olives	1	NL/002	1998	0.01			
	organs	13	NL/002	1998	0.033	0.021	0.015	0.124
	organs	38	NL/002	2000	0.106	0.035	0.03	1.33
	rest feral and poultry	3	NL/002	1997	0.006	0.01	0.005	0.017
	wheatproducts	2	NL/002	2001	0.02	0.02	0.015	0.025
	vegetables and products	1	NL/002	1997	0.01			
	vegetables and products	1	NL/002	1999	0.05			
	vegetables and products	5	NL/002	1998	0.04	0.04	0.005	0.07
	vegetables and products	5	NL/002	2001	0.155	0.021	0.005	0.7
	nuts and seedproduct	1	NL/002	2001	0.7			
	nuts and seedproduct	1	NL/002	1998	0.03			
	other shell fish	10	NL/002	1999	0.042	0.04	0.005	0.08
	other shell fish	1	NL/002	2001	0.19			
	other flavours	1	NL/002	1997	0.1			
	tropical fruit	1	NL/002	1998	0.01			
	other fishproducts	3	NL/002	1997	0.026	0.033	0.05	0.038
	other fishproducts	2	NL/002	1998	0.026	0.026	0.016	0.036
	other fishproducts	6	NL/002	1999	0.046	0.053	0.005	0.08
	other fishproducts	28	NL/002	2001	0.096	0.03	0.005	0.7
	other fishspecies	42	NL/002	1999	0.026	0.005	0.005	0.81
	other fishspecies	6	NL/002	2001	0.042	0.025	0.01	0.14
	other meatproducts	1	NL/002	1998	0.191			
	eel	22	NL/002	1999	0.012	0.005	0.005	0.17
	paprica sharp	2	NL/002	1997	0.01	0.01	0.01	0.02
	paprica powder	17	NL/002	1997	0.163	0.2	0.1	0.3

SCOOP 3.2.11 – Intake of As, Cd, Pb and Hg

Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>The Netherlands cont.</b>								
	guinea fowl	1	NL/002	2001	0.005			
	peppers	20	NL/002	2002	0.015	0.015	0.01	0.02
	hot sauce	1	NL/002	1998	0.03			
	peanut, earthnut	1	NL/002	1997	0.02			
	gurnard	6	NL/002	1999	0.005	0.005	0.005	0.02
	leek	15	NL/002	2002	0.068	0.046	0.009	0.43
	radish	2	NL/002	1997	0.025	0.025	0.02	0.03
	deer	3	NL/002	1997	0.001	0.003	-0.001	0.004
	deer	6	NL/002	2001	0.007	0.007	0.01	0.01
	red beetroot	1	NL/002	1998	0.08			
	red beetroot	1	NL/002	2002	0.006			
	sardine	4	NL/002	1997	0.09	0.09	0.01	0.171
	sardine	4	NL/002	1998	0.022	0.017	0.003	0.051
	sardine	19	NL/002	1999	0.032	0.026	0.004	0.084
	sardine	44	NL/002	2001	0.039	0.04	0.01	0.11
	dab	22	NL/002	1999	0.005	0.005	0.005	0.04
	haddock	1	NL/002	1998	0.005			
	haddock	3	NL/002	1999	0.005	0.005	0.005	0.005
	haddock	1	NL/002	2001	0.03			
	plaice	27	NL/002	1999	0.005	0.005	0.005	0.005
	chard	1	NL/002	1998	0.38			
	butterbean	2	NL/002	1997	0.01	0.01	0.01	0.01
	spinach	4	NL/002	2002	0.047	0.057	0.013	0.061
	St.jakopshelf	1	NL/002	1999	0.04			
	sugar	2	NL/002	2000	0.005	0.005	0.005	0.005
	table wine	1	NL/002	2001	0.016			
	flour	8	NL/002	1997	0.03	0.028	0.018	0.038
	flour	70	NL/002	2000	0.038	0.039	0.009	0.084
	flour	176	NL/002	2001	0.045	0.045	0.01	0.13
	flour	5	NL/002	2002	0.021	0.011	0.009	0.05
	tomatoes	8	NL/002	1997	0.031	0.025	0.004	0.066
	tomatoes	5	NL/002	1998	0.016	0.02	0.01	0.02
	tomatoes	1	NL/002	2002	0.002			
	tomatoes on sauce	1	NL/002	1998	0.01			
	tomatoes on sauce	4	NL/002	2001	0.01	0.01	0.01	0.01
	mashed tomatoes	13	NL/002	1997	0.05	0.05	0.02	0.1
	mashed tomatoes	37	NL/002	1998	0.064	0.07	0.02	0.1
	mashed tomatoes	4	NL/002	2000	0.055	0.06	0.03	0.07
	mashed tomatoes	15	NL/002	2001	0.033	0.02	0.005	0.11
	tomatoesauce	4	NL/002	1998	0.015	0.015	0.01	0.02
	sole	7	NL/002	1999	0.005	0.005	0.005	0.005
	lemon sole	1	NL/002	1999	0.005			
	tuna	4	NL/002	1997	0.025	0.024	0.016	0.038
	tuna	3	NL/002	1998	0.018	0.016	0.011	0.026
	tuna	15	NL/002	1999	0.022	0.014	0.005	0.06
	tuna	17	NL/002	2001	0.021	0.02	0.01	0.06
	onion	1	NL/002	1997	0.01			
	onion	1	NL/002	1998	0.04			
	onion	4	NL/002	2002	0.005	0.005	0.005	0.005
	corn salad	1	NL/002	1999	0.065			
	meat	3	NL/002	1998	0.051	0.055	0.023	0.074
	processed meat	1	NL/002	1998	0.04			
	food supplements	3	NL/002	2001	0.022	0.025	0.015	0.05

SCOOP 3.2.11 – Intake of As, Cd, Pb and Hg

Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>The Netherlands cont.</b>								
	fruit on juice	1	NL/002	2001	0.003			
	fruit on syrup	1	NL/002	1997	0.01			
	whiting	23	NL/002	1999	0.005	0.005	0.005	0.04
	wild product	3	NL/002	1997	0.005	0.005	0.005	0.019
	winter carrot	1	NL/002	2001	0.029			
	winter carrot	1	NL/002	2002	0.083			
	chicory	5	NL/002	1997	0.005	0.005	0.005	0.005
	white cabbage	2	NL/002	1997	0.005	0.005	0.005	0.005
	white cabbage	1	NL/002	1998	0.04			
	white cabbage	3	NL/002	2002	0.004	0.004	0.004	0.005
	white pepper	3	NL/002	1997	0.023	0.03	0.01	0.03
	carrot	1	NL/002	1997	0.02			
	carrot	1	NL/002	1999	0.013			
	carrot	3	NL/002	2002	0.019	0.008	0.005	0.011
	salmon	5	NL/002	1997	0.005	0.005	0.005	0.005
	salmon	6	NL/002	1999	0.016	0.02	0.005	0.02
	salmon	3	NL/002	2001	0.008	0.01	0.01	0.01
	salt	3	NL/002	1997	0.005	0.005	0.005	0.005
	salt	21	NL/002	2000	0.001	0.001	0.001	0.01
	sauerkraut	9	NL/002	1997	0.005	0.005	0.005	0.01
	black pepper	3	NL/002	1997	0.005	0.005	0.005	0.06
	black coal fish	3	NL/002	1999	0.005	0.005	0.005	0.005
	swine	1	NL/002	1997	0.007			
	swine	1	NL/002	1998	0.0025			
	swine	8	NL/002	2001	0.006	0.005	0.01	0.01
<b>Norway</b>								
2	Fats and oils	6		2001	0		0	0
4	Vegetables and fungi	504		1993-1995	0.01365		<0.001	0.122
5	Confectionary	6		1999	0.01800		<0.001	0.031
6	Cereals	269		1995-2001	0.03660		0.001	0.164
8	Meat	856		2001-2001	0.67129		<0.01	16.5
9	Fish	766		1994-1997	0.025961		<0.0005	0.038
9.1.4	Shellfish	148		1994-2000	1.124875		0.01	8
10	Egg	27		2000-2001	0.005		<0.01	0.01
11	Sweeteners	21		1999-2001	0.0035		0	0.03
14	Beverages	94		1999-2001	0.00039		0	0.005
<b>Portugal</b>								
	vegetable oil	9	PT-040	2000-2001	0.011		<0.02	<0.03
	fruits and vegetables	148	PT-10,040,120	1998-2002	0.043		0.004	<0.4
	potato	53	PT-010	1998-2000	0.0381		<0.07	<0.1
	chocolate	3	PT-020	2002			0.007	0.016
	cereals and flour	71	PT-020,040	1999-2002	0.027		0.003	0.085
	breakfast cereals	20	PT-040	2001				<0.05
	pasta and noodles	2	PT-040	2000				<0.03
	cakes	2	PT-040	2000				<0.03
	liver(bovine,caprine,quail,rabbit,chicken, wild boar,ovine,turkey,pork,deer)	259	PT-050	2001	0.0106		0.00004	52.8
	equine liver	15	PT-050	2001	5.7	5.9	0.6	14.1
	fresh fish	194	PT-060	1998-2001	0.005		<0.01	0.1

SCOOP 3.2.11 – Intake of As, Cd, Pb and Hg

Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>Portugal cont.</b>								
	bivalves e molluscs	34	PT-020,060	1998-2002	0.1043		<0.01	0.38
	canned fish,molluscs,bivalves	212	PT-020,060,040,120	1996-2001			0.002	2
	sugar	2	PT-020	2000	<0.03		<0.03	<0.03
	salt	9	PT-040	2000	<0.003		<0.003	<0.003
	natural mineral waters and source	13	PT-030	2000-2001	0.000118		<0.0001	<0.001
	still wine	206	PT-020,070	1999-2002			<0.0001	0.007
<b>Sweden</b>								
1.1-1.5	Dairy products, milk	20	SE 010	1998	<0.001			
1.6	Dairy products, cheese	23	SE 016	1995	0.002		0.001	0.003
4.1-4.2	Fruits and vegetables	146	SE 005,017,018, 021	1996-02	0.018		<0.001	0.051
4.2.1	Potatoes	75	SE 005	2000	0.010		0.001	0.028
6	Cereals	30	SE 007,010,012, 018,022	1997-01	0.035		<0.001	0.013
7	Bakery wares	28	SE 014	1999	0.021		0.004	0.055
8.1-8.3	Meat	344	SE 006,009,015, 023	1994-97	0.007		<0.002	0.019
8.1	Horse meat	95	SE009	1194-97	0.042		0.001	0.22
8.4	Offals	460	SE 006,009,024	1994-99	2.56		0.002	36
9.1.1,9.4	Fish	75	SE 001,020	1993,2001	0.017		<0.001	0.11
10	Egg	5	SE 008	1998	<0.0007			
11	Honey	6	SE 004	2001	<0.002			
12.2	Spices	4	SE 019	1997	0.13		0.027	0.23
16	Composite foods	4	SE 013	1999	0.013		0.005	0.026
<b>United Kingdom</b>								
Total Diet Study								
1.2.2.2	Dairy produce	20	0	1997	0.0011		<0.0005	0.0049
1.1	Milk	20	0	1997	0.0002		<0.0001	0.001
2	Oil & fats	20	0	1997	0.0025		<0.0009	0.0185
4.1.1	Fresh fruit	20	0	1997	0.0015		0.0004	0.0033
4.1.2	Fruit products	20	0	1997	0.0008		<0.0002	0.0058
4.2	Green vegetables	20	0	1997	0.0229		0.0028	0.315
4.2	Other Vegetables	20	0	1997	0.0106		0.0048	0.032
4.2	Potatoes	20	0	1997	0.0256		0.0072	0.129
4.2.2.4	Canned vegetables	20	0	1997	0.0056		0.0039	0.0089
4, 5, 11	Sugar and preserves	20	0	1997	0.0071		0.0018	0.0387
6	Miscellaneous cereals	20	0	1997	0.0227		0.0134	0.047
7.1.1	Bread	20	UK/010	1997	0.0284		0.0218	0.0353
8	Carcase meat	20	UK/010	1997	0.0008		0.0003	0.0034
8	Poultry	20	UK/010	1997	0.0025		<0.0004	0.0217
8.3	Meat Products	20	UK/010	1997	0.0097		0.004	0.0236
8.4	Offal	20	UK/010	1997	0.077		0.0297	0.191
9	Fish	20	UK/010	1997	0.013		0.0036	0.0657
10	Eggs	20	0	1997	0.0004		<0.0003	0.0007
14	Beverages	20	0	1997	0.0002		<0.0001	0.0006
15.2	Nuts	20	0	1997	0.0588		0.0226	0.136
Ad hoc Surveys								
8.4	Offals	92	UK/008/009	1997-1998	0.11		<0.01	0.72
9.1.1	Fish and Shellfish	110	UK/003	1996-1997	0.01		0.01	0.06
9.1.2	Fish and Shellfish	9	UK/003	1996-1997	0.3		0.11	0.67
9.1.3	Fish and Shellfish	3	UK/003	1996-1997	0.01		0.01	0.02
9.1.4	Fish and Shellfish	12	UK/003	1996-1997	0.354		0.03	2.7
9.1 –	Fish and Shellfish	7	UK/003	1996-1997	0.13		0.03	0.23

## SCOOP 3.2.11 – Intake of As, Cd, Pb and Hg

Food group code	Food name	Number of samples	Reference	Year of sampling	Mean level of cadmium	Median level of cadmium	Min	Max
<b>United Kingdom cont.</b>								
9.2.2	Fish and Shellfish	3	UK/003	1996-1997	0.01		0.01	0.01
13	Infant Foods	96	UK/001/011	1997-1999	0.011		<0.0001	0.096
14	Beverages**	91	UK/004/005	1997	0.005		0.00003	0.03
4, 6, 14, 16, 12, 2	Vegetarian Foods	99	UK/006/007	1997-1998	0.014		0.0006	0.2
1, 7, 16, 15, 9, 8, 4, 12,	Snack and Convenience foods	298	UK/002	1996-1999	0.017		0.01	0.27

\* Cockles and winkles. \*\* Including 4 samples of 5.1 (dried chocolate drinks) and 3 samples of 1.1.4 (flavoured milks/yoghurts)

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## 4. DIETARY INTAKE OF LEAD

Over the past decades, the lead level in food has decreased significantly owing to source-related efforts to reduce the emission of lead, and improvements in quality assurance of chemical analysis. Lead is present at low concentrations in most foods. Offal and molluscs may contain higher levels. Contamination of food during processing or food production in contaminated areas are the main reasons for enhanced lead intake via foodstuffs.

### 4.1 Toxicology

Absorption of ingested lead may constitute a serious risk to public health. Some chronic effects of lead poisoning are colic, constipation and anaemia. It may also induce increased blood pressure and cardiovascular disease in adults. Foetal neuro-developmental effects and reduced learning capacity in children are among the most serious effects. (ref. 1-3)

### 4.2 Recommendations on intake limitations

A Provisional Tolerable Weekly Intake (PTWI) of 0.025 mg/kg (25 µg/kg) bodyweight have been decided for lead. This is equal to 1.75 mg/week (1750 µg/week) for a person weighing 70 kg. The average intake of lead by adults in the Member States is, according to current information, 42 µg/day (Table 4.2), which is equal to 296 µg/week (range 7 - 973 µg/week. Table 4.3). This corresponds to 14% (0.5 – 56%) of the PTWI (Table 4.4), assuming an average

**Table 4.1. Lead. Consumption of food in g/day by the mean adult population in the Member States. The figures are based on products for which occurrence data for Pb are available.**

Food group	BE	DK	FI	FR	DE	HE	IR	IT	NO	PT	SE	UK	Mean
Milk and milk products	238	357	420	158		112		130	463		344	281	<b>278</b>
Condensed, powder milk, cheese, yoghurt	28	33		83	41			43	31		28	60	<b>43</b>
Fats and oils		48		20	21			20		9.9		27	<b>24</b>
Fruits and vegetables	336	421	149	353	352	0.5		448	255	332	171	379	<b>290</b>
Confectionary		30		5	5.9				10	1.0			<b>10</b>
Cereals and bakery wares		217	2.8	253	188	23		216	175	290	142	209	<b>172</b>
Meat		136	71	148	175	37	87	110	49		101	88	<b>100</b>
Offal	0.2		3.0	3.2	2.0	1.6	0.9	6.5	2.0	2.2		1.0	<b>2.2</b>
Fish and fish products		23	53	30	16	36	20	32	61	40	22	14	<b>32</b>
Bivalves, crustaceans and cephalopods			1.6	4.7	0.78	5.2	0.65		11	10			<b>4.8</b>
Eggs		21	19	20	33			14	17		15	14	<b>19</b>
Sweeteners	0.4		1.1	16	13				6.0	31	0.6	63	<b>16</b>
Salts and spices				9.3	2.3								<b>5.8</b>
Beverages	1020	2003*	476	1091	376			84	693	176	39	937	<b>690</b>
Ready to eat									2.0			2.0	<b>2.0</b>
<b>Sum/Member State</b>	<b>1623</b>	<b>3289</b>	<b>1196</b>	<b>2194</b>	<b>1227</b>	<b>215</b>	<b>109</b>	<b>1104</b>	<b>1775</b>	<b>892</b>	<b>863</b>	<b>2075</b>	<b>1380</b>

\*Including drinking water.

weight of 70 kg for a Member State adult. The SCF concluded in its opinion of 19<sup>th</sup> of June 1992 that the mean level of lead in foodstuffs does not presently seem to be a cause for alarm. However, long-term action should follow with the objective of further lowering the levels of lead in foodstuffs.

### 4.3 Intake of lead by the mean adult population

Twelve Member States submitted data for the mean adult population (BE for 14-18 year olds). In addition, several Member States submitted data for other population groups (Table 1.1).

The total consumption of food for which there are occurrence data available are shown in Table 4.1. Only two Member States have carried out complete intake surveys; DK, who reported a mean intake of 18 µg/day and UK with 27µg/day (Table 4.2). The intake in all other reporting Member States are thus based on surveys that lack data from one or several food groups, which will result in an underestimation of the intake. The composition of the food groups may also result in under- or overestimation of the contribution from that particular food group.

The presence (or absence) of a particular food with a very high (or very low) occurrence level and which is much (or little) consumed may thus have a great impact on the intake from that food group.

**Table 4.2. Lead. Daily Intake (µg/day) by the Mean Adult Population.**

Food group	BE	DK	FI	FR	DE	HE	IR	IT	NO	PT	SE	UK	Mean
Milk, milk products	0.95	0.59	2.1	0.32		1.38		0.91	0.93		0.34	0.28	<b>0.87</b>
Condensed, powder milk, cheese, yoghurt	0.74	0.19			1.3			1.94	0.062		0.25	0.48	<b>0.71</b>
Fats and oils		0.6			0.74			0.22		0.48		0.14	<b>0.44</b>
Fruit and vegetables	17.4	3.98	1.72	25.2	14	0.29		16.7	1.51	117	0.69	4.98	<b>18</b>
Confectionary		0.74			0.39				0.04	0.031			<b>0.30</b>
Cereals and bakery wares		2.35*	0.08*	9.63*	6.0	3.20*		4.35	2.2*	0.53	1.43	4.0	<b>3.4</b>
Meat		0.99	1.25	1.83	11	4.21	0.42	2.82	3.24		0.74	1.23	<b>2.8</b>
Offal	0.01		0.14	0.14	0.16	0.23		1.17	0.066	0.15		0.09	<b>0.24</b>
Fish and fish products		0.16	0.48	0.70	0.36	13.8	0.34	1.27	0.97	2.22	0.066	0.28	<b>1.9</b>
Bivalves, crustaceans and cephalopods			0.04	0.79	0.08	2.03	0.35		1.2	0.51			<b>0.71</b>
Eggs		0.03	0.19	0.12	0.70			0.14	0.42		0.008	0.04	<b>0.21</b>
Sweeteners	0.04		0.02	0.47	0.65				0.047	0.17	0.023	1.0	<b>0.30</b>
Salts and spices				3.92	2.2								<b>3.0</b>
Beverages	18.7	8.61**	0.48	13.7	9.7**			4.2	10.1	12.2	1.17	14	<b>8.9</b>
Ready to eat									0.008			0.02	<b>0.01</b>
<b>Sum/Member State</b>	<b>38</b>	<b>18</b>	<b>6</b>	<b>57</b>	<b>47</b>	<b>25</b>	<b>1.1</b>	<b>30</b>	<b>21</b>	<b>133</b>	<b>5</b>	<b>27</b>	<b>42</b>

\* Only cereals. \*\* Including drinking water.

In most Member States the average intake is below 25% of the PTWI (Table 4.4). In FI and SE, who have intake data from most of the major food groups, the intake is only 2% of the PTWI. The AQC data presented together with the occurrence data indicate that this low level is based on reliable data.



**Table 4.3. Lead. Weekly Intake (µg/week) by the Mean Adult Population.**

Food group	BE	DK	FI	FR	DE	HE	IR	IT	NO	PT	SE	UK	Mean
Milk, milk products	6.65	4.13	14.7	2.24		9.66		6.37	6.51		2.38	1.96	<b>6.1</b>
Condensed, powder milk, cheese, yoghurt	5.18	1.33			9.0			13.6	0.43		1.75	3.36	<b>4.9</b>
Fats and oils		4.2			5.2			1.54		3.36		0.98	<b>3.1</b>
Fruit and vegetables	122	27.9	12	176	96	2.03		117	10.6	819	4.83	34.9	<b>129</b>
Confectionary		5.18			2.8				0.28	0.217			<b>2.1</b>
Cereals and bakery wares		16.5*	0.56*	67.4*	42	22.3*		30.4	15.4*	3.76	10.0	28	<b>24</b>
Meat		6.93	8.75	12.8	78	29.5	2.94	19.7	22.7		5.18	8.61	<b>20</b>
Offal	0.07		0.98	0.98	1.1	1.61		8.19	0.46	1.05		0.63	<b>1.7</b>
Fish and fish products		1.12	3.40	4.88	2.5	96.3	2.38	8.89	6.79	15.5	0.462	1.96	<b>13</b>
Bivalve, crustaceans and cephalopods			0.28	5.56	0.54	14.2	2.45		8.4	3.57			<b>5.0</b>
Eggs		0.21	1.33	0.85	4.9			0.98	2.94		0.056	0.28	<b>1.4</b>
Sweeteners	0.28		0.14	3.31	4.6				0.33	1.19	0.161	7.0	<b>2.1</b>
Salts and spices				27.5	15								<b>21</b>
Beverages	131	60.3**	3.36	95.7	68**			29.4	70.7	85.2	8.19	98	<b>62</b>
Ready to eat									0.06			0.14	<b>0.1</b>
<b>Sum/Member State</b>	<b>265</b>	<b>128</b>	<b>46</b>	<b>397</b>	<b>330</b>	<b>176</b>	<b>7.8</b>	<b>208</b>	<b>146</b>	<b>933</b>	<b>33</b>	<b>186</b>	<b>296</b>

\* Only cereals. \*\*Including drinking water

In PT the intake is in the order of 50% of the PTWI. Possible reasons for this high intake will be discussed in section 4.6.

**Table 4.4. Lead. Weekly Intake in % of the PTWI by the Mean Adult Population. (PTWI for Pb = 0.025 mg/kg bodyweight = 25 µg/kg bodyweight)**

Food group	BE	DK	FI	FR	DE	HE	IR	IT	NO	PT	SE	UK	Mean
<b>Mean body weight</b>	<b>60</b>	<b>72</b>	<b>77.1</b>	<b>66.4</b>	<b>70.5</b>	<b>70</b>	<b>75</b>	<b>70</b>	<b>73</b>	<b>70</b>	<b>73.7</b>	<b>70.1</b>	<b>70.6</b>
Milk, milk products	0.44	0.23	0.76	0.14		0.55		0.36	0.36		0.13	0.11	<b>0.34</b>
Condensed, powder milk, cheese, yoghurt	0.35	0.07			0.51			0.78	0.02		0.09	0.19	<b>0.29</b>
Fats and oils		0.23			0.29			0.09		0.19		0.06	<b>0.17</b>
Fruits and vegetables	8.12	1.5	0.62	10.6	5.42	0.12		6.68	0.58	46.8	0.26	1.99	<b>7.52</b>
Confectionary		0.29			0.16				0.02	0.01			<b>0.12</b>
Cereals and bakery wares		0.91	0.03	4.06	2.39	1.28		1.74	0.84	0.21	0.54	1.60	<b>1.36</b>
Meat		0.39	0.45	0.77	4.43	1.68	0.16	1.13	1.24		0.28	0.49	<b>1.10</b>
Offal	0.00		0.05	0.06	0.06	0.09		0.47	0.03	0.06		0.04	<b>0.10</b>
Fish and fish products		0.062	0.17	0.29	0.14	5.50	0.13	0.51	0.37	0.89	0.03	0.11	<b>0.75</b>
Bivalve, crustaceans and cephalopods			0.01	0.34	0.03	0.81	0.13		0.46	0.20			<b>0.28</b>
Eggs		0.012	0.07	0.05	0.28			0.06	0.16		0.003	0.02	<b>0.08</b>
Sweeteners	0.02		0.01	0.20	0.26				0.02	0.07	0.01	0.40	<b>0.12</b>
Salts and spices				1.65	0.86								<b>1.26</b>
Beverages	8.74	3.3	0.17	5.76	3.87			1.68	3.87	4.87	0.44	5.59	<b>3.67</b>
Ready to eat									0.003			0.01	<b>0.01</b>
<b>Sum %/Member State</b>	<b>18</b>	<b>7</b>	<b>2.4</b>	<b>24</b>	<b>19</b>	<b>10</b>	<b>0.4</b>	<b>12</b>	<b>8.0</b>	<b>53.3</b>	<b>1.8</b>	<b>11</b>	<b>14</b>

After taking all the factors into account, the conclusion is that the general adult population runs a low risk of exceeding the PTWI for lead. It seems unlikely that consumers, even those with a high level intake (see Tables 4.24-4.27), would exceed the PTWI of 1.75 mg/week for a person weighing of 70 kg.

#### 4.4 Intake of lead by children: Mean population

Intake data were reported by FR and DE ( BE reported intake data for 14-18 year olds, but they are included in the tables for the mean adult population). The data are shown in Table 4.5, together with data on their percentage of the PTWI. Since children have a lower body mass, their body burden per kg bodyweight will generally be larger than that for adults. The intake by children in FR is 35%, inPTWI, which is 11 % higher than for the adult population. I DE the intake by young children is 24% of the PTWI and for the older children 35%. This is 6 – 15% higher than for the adult population. Children with a high consumption of foods with high levels of Pb thus run a greater risk than adults, of exceeding the PTWI (see Table 4.27).

High level daily intake by children in the mean population group, as well as by children in the consumers only group are shown in section 4.8, table 4.27.

**Table 4.5. Lead. Intake by children in various age brackets. Mean Population.**

	Daily intake, µg			Weekly intake, µg			% of PTWI		
	Age bracket, year			Age bracket, year			Age bracket, year		
	3-14	4-6	10-12	3-14	4-6	10-12	3-14	4-6	10-12
<b>Food</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>
							<b>31.6*</b>	<b>20.97*</b>	<b>40.95*</b>
Milk and milk products	0.5	0.001	0.001	3.7	0.007	0.007	0.47	0.001	0.001
Condensed, powder milk, cheese, yoghurt		0.63	0.71		4.4	5.0		0.83	0.49
Fats and oils		0.46	0.64		3.2	4.5		0.61	0.44
Fruit and vegetables	17	8.5	11	120	59	75	15.1	11	7.3
Confectionary		0.62	0.69		4.4	4.8		0.83	0.5
Cereals and bakery wares	11	4.1	5.7	79	29	40	9.95	5.5	3.9
Meat	1.4	5.4	8.7	9.6	38	61	1.21	7.2	5.9
Offal	0.1	0.07	0.13	0.5	0.48	0.9	0.06	0.09	0.09
Fish and fish products	0.5	0.16	0.22	3.3	1.1	1.5	0.42	0.22	0.15
Bivalve, crustaceans and cephalopods	0.3	0.02	0.02	2.2	0.11	0.1	0.27	0.02	0.01
Eggs	0.1	0.45	0.54	0.5	3.2	3.8	0.07	0.60	0.37
Sweeteners	0.1	0.40	0.43	1.0	2.8	3.0	0.13	0.53	0.3
Salt and spices	2.7	1.4	1.7	19	10	12	2.39	1.8	1.2
Beverages	5.8	4.0	4.4	40	28	31	5.1	5.4	3.0
<b>Sum/age bracket</b>	<b>40</b>	<b>26</b>	<b>34</b>	<b>278</b>	<b>184</b>	<b>241</b>	<b>35 %</b>	<b>35 %</b>	<b>24 %</b>

\*Mean body weight

## 4.5 Legislation

In Table 4.6 the MLs for lead, as defined in Commission Regulation (EC) No 466/2001, are compared with available occurrence data from the Member States. Some of these data comes from the occurrence summary table (Table 4.28) and others from the main occurrence table in *Annex B*. The occurrence data were collected to give as realistic a picture as possible of the current status. They are to some extent an approximation based on many data sets and do not claim to be an “absolute” truth.

The comparison shows that for most food groups and in most Member States the MLs are rarely exceeded (figures above the ML are marked in **bold**). In some cases, e.g., for meat it was not relevant to calculate a mean for every country, therefore the results are shown as a range. A large range may indicate contamination problems during sampling and/or analysis. It may also indicate that the analytical method is not fully under control.

**Table 4.6. Lead. Maximum Levels (ML) in mg/kg, as defined in Commission Regulation (EC) No 466/2001, and compared with occurrence data from the Member States. Figures above the ML are marked in bold.**

Product	ML	BE	DK	FI	FR	DE	HE	IR	IT	NO	PT	SE	UK
Cows milk (3.1.1)	<b>0.02</b>	0.004	<0.001- <b>0.023</b>	<0.010	0.002	0.014*	0.012	<b>0.05</b>	<0.005- 0.007	0.002		<0.002	0.001
Fats and oils (3.1.11)	<b>0.1</b>					0.036			0.012- 0.089	0.001			0.005
Fruit (3.1.10)	<b>0.1</b>		0.033			0.027		<b>0.64</b>	0.040			0.029	
Berries and small fruits (3.1.10.1)	<b>0.2</b>	<0.04			0.049								
Vegetables (3.1.9)	<b>0.1</b>			0.005- 0.018		0.04		0.86	0.035	0.006		0.014	0.003
Potatoes (3.1.9)	<b>0.1</b>			0.012							<b>0.34</b>	0.002	0.001
Cereals (3.1.8)	<b>0.2</b>	<0.040	<0.024		0.09- <b>0.27</b>	0.032	0.14		0.025	0.010	0.018- 0.15	0.009	0.017
Meat (3.1.3)	<b>0.1</b>	<0.040- <b>0.18</b>	<0.015	0.010- 0.020	0.012	0.054- 0.067	0.06- <b>0.77</b>	0.010- <b>0.25</b>	0.03	0.034		0.009	0.006
Edible offal (3.1.3.1)	<b>0.5</b>	0.063		0.02- 0.06	0.044	0.081	0.14		0.18		0.03- 0.27	0.088	0.09
Fish muscle meat (3.1.4/3.1.4.1)	<b>0.2/0.4</b>	<0.02- 0.14	<0.009	<0.010- 0.032	0.023	0.022	0.03- <b>1.0</b>		0.080	0.015	0.055	0.004	0.02
Crustaceans, excluding brown meat of crab (3.1.5)	<b>0.5</b>	<0.04- 0.11		0.02- 0.065	0.24	0.099				<b>0.63</b>			
Bivalve molluscs (3.1.6)	<b>1.5</b>	<0.040- 0.40			0.12		0.38- 0.88		0.15				
Cephalopods (3.1.7)	<b>1.0</b>						0.26- 0.36						
Fruit juices (3.1.12)	<b>0.05</b>	0.018			0.037	0.024					<0.005		
Wine (3.1.13)	<b>0.2</b>	0.012			0.029	0.16			0.042- 0.060		0.077	0.03	

\* only milk powder

## 4.6 Comments on the intake of lead by the mean adult population by Member State

This summary only reports the mean intake of the adult population in the individual Member State. Particular findings are highlighted. Consumers, high-risk groups or particular age-segments are not included. The comments relate mainly to the contents of Tables 4.1-4.4.

### BELGIUM

**Estimated intake of lead:** Data reported for 6 food categories. Several important groups are missing. The mean daily intake of 38 µg is relatively high, 18% of the PTWI, compared to other Member States. Although several major food groups are missing the sampled food groups provide 1623 g of food/day, of which non-alcoholic beverages is 1014 g. The major contribution to the diet comes from fruit and vegetables (17 µg) and non-alcoholic beverage (19 µg).

#### Analytical Quality Assurance

Certified reference materials have been used extensively, with good correlation between found and certified results. Participation in several proficiency tests has resulted in acceptable Z-scores.

### DENMARK

**Estimated intake of lead:** The Danish survey includes all major food groups and provides a consumption of 3289 g of food/day, Beverages (including drinking water) make up 2003 g of the total consumption. The mean lead intake which is fairly low, 18 µg/day (7% of the PTWI), is on the same order of magnitude as in the other Nordic countries. The major source of lead in the diet appears to be beverages, that contribute nearly 50% to the daily intake of lead. Denmark did not follow the agreed model for calculating results below the LOD. Instead they used the LOD as the assigned value, which results in a slightly different estimation of the intake.

#### Analytical Quality Assurance

A number of different certified reference materials, relevant for the survey, was analysed in parallel to the samples. The results showed good agreement with the certified levels. No results from proficiency tests were reported.

### FINLAND

**Estimated intake of lead:** Data reported for 10 food groups, including all major groups. The mean intake is very low, 6 µg/day, which is only 2.4 % of the PTWI. The intake represents a daily food consumption of 1196 gram. Milk contributes 2.1 µg and 1.7 µg comes from fruit and vegetables.

#### Analytical Quality Assurance

Use of CRMs and participation in PT programmes is reported, but no analytical data were provided.

### FRANCE

**Estimated intake of lead:** Data reported for 11 food groups, including all major groups, which corresponds to a food consumption of 1895 g/day, out of a total of 2193 g/day. The mean intake of 56.8 µg/day constitute 24 % of the PTWI. This is relatively high, compared with other

Member States. The main contributor is fruit and vegetables, with a mean content of 66 µg/kg. It appears, however, that some dried fruits and certain mushrooms increase the mean level considerably. Unexpectedly high levels are also reported for cereals and cereal products which contribute 17% to the daily intake. The dietary intake calculation is, however, based on only 6 occurrence data on 4 items. This therefore represents an approximation for this group. These two groups contribute 61% of the daily intake of lead, followed by beverages (including waters and wine) with 24%.

#### **Analytical Quality Assurance**

Certified reference materials has been used extensively, as well as participation in proficiency tests. Most of these have, however, involved animal tissues and milk powder.

#### GERMANY

**Estimated intake of lead:** Data reported for 13 food groups, including all major groups. The mean daily intake is relatively high, 47 µg/day, which is 19% of the PTWI. This primarily due to a very high level in wine, 156 µg/kg. It is assumed that these wine samples were not ordinary wine off the shelf, but sampled due to some suspicion of contamination. The other major source is meat from game, with a mean level of 1370 µg/kg. The only probable source for such high levels is gunshot residues. Omitting these food groups the daily intake is reduced to 27 µg/day, or 11% of the PTWI.

#### **Analytical Quality Assurance**

Certified reference materials has been used extensively, as well as participation in proficiency tests. The results are generally acceptable.

#### GREECE

**Estimated intake of lead:** Data reported for 7 food groups. Several major food groups are missing. Considering that the intake is based on a food consumption of only 215 g/day, the mean daily intake of 25 µg, corresponding to 10% of the PTWI, is very high. All food groups, with the exception of milk, display very high lead levels. Fruit and vegetables have a mean level of 0.61 mg/kg, which is a factor of 10 higher than in other Member States. Occurrence data for this group consists only of dried fruit and canned vegetables. The dried fruit will have a high lead level due to the higher dry matter content. Meat (fermented) is reported to contain 0.78 mg/kg, which is extraordinary. Fish alone provide 14 µg to the daily diet, due to an occurrence level of 0.2-0.5 mg/kg. This is also intriguing, since it must be assumed that most fish is of mediterranean origin. Consumers of fish may thus risk to exceed the PTWI for lead. If more food groups were included it can be assumed that the mean intake of lead would be even higher.

#### **Analytical Quality Assurance**

The different laboratories have participated in several PT-programmes and have used a number of different certified reference materials. It can, however, not be concluded that these results verify the above mentioned abnormal results.

#### IRELAND

**Estimated intake of lead:** Data reported for 4 food groups. The mean daily intake is 1 µg (0.4% of the PTWI), which is very low. It is, however, only based on a daily consumption of 109 g of meat and seafood.

#### **Analytical Quality Assurance**

The two laboratories have analysed several certified reference materials. Both have participated in several PT-programmes, with acceptable result.

#### ITALY

**Estimated intake of lead:** Data reported for 10 food groups, including all major groups, making a total consumption of 1303 g/day. The mean daily intake is 30 µg, which corresponds to 12% of the PTWI. The major source is fruit, which contribute 17 µg/day. Cereals and bakery ware is the 2<sup>nd</sup> largest source with 4 µg/day.

#### **Analytical Quality Assurance**

Use of CRMs and participation in PT programmes is indicated. However, no analytical data are reported.

#### the NETHERLANDS

**Estimated intake of lead:** The data available was considered too limited for an attempt to calculate a relevant mean daily intake and was withdrawn by the participant.

#### NORWAY

**Estimated intake of lead:** Data reported for 13 food groups, including all major groups. The mean daily intake of lead is 21 µg (8% of the PTWI). Beverages (as coffee ) contributes 10 µg/day and meat products 3 µg/day. Beef is reported to contain an average of 0.034 mg/kg, which must be considered to be rather high for uncontaminated meat.

#### **Analytical Quality Assurance**

Use of CRMs and participation in PT programmes is indicated. However, no analytical data are reported.

#### PORTUGAL

**Estimated intake of lead:** Data reported for 8 food groups, including most major food groups. The reported daily intake is 133 µg (54% of the PTWI). This is very high, considering that a food consumption of 892 g/day is indicated. Potatoes are reported to contain, on average, 0.363 mg/kg, which provides 117 µg to the total intake. Lettuce is reported to contain 0.426 mg/kg. The LOD is reportedly very high, ≤ 1 mg/ kg, for products in this food group. Since half the LOD is assigned the product as its occurrence level the intake may be erroneously high. If the fruit and vegetables group is omitted, the intake decreases to 22 µg/day (9% of the PTWI).

#### **Analytical Quality Assurance**

Use of CRMs and participation in PT programmes indicated. CRM-results for wine shown with results. PT-result for tomato paste shown, also with acceptable result.

#### SWEDEN

**Estimated intake of lead:** Data reported for 9 food groups, including all major groups. The reported daily intake is 5 µg. This corresponds to 2% of the PTWI. The daily intake of food is

reportedly 863 g, which is comparatively low. Beverages (wine) and cereals are the main contributors with 1.4 and 1.2 µg/day, respectively. Although the wine consumption has increased in Sweden, it is not so large as to make its lead content a serious problem.

#### **Analytical Quality Assurance**

Extensive use of CRMs. Regular participation in PT-programmes. The presented results show acceptable agreement.

#### UNITED KINGDOM

**Estimated intake of lead:** The UK Total Diet Study shows a mean population intake of 27 µg/day, which corresponds to 11% of the PTWI. The average food consumption is 2075 g/day. Beverages are the main contributor to the mean dietary exposure with 14 µg/day. For mean level consumers the intake corresponds to 9.6% (24 µg/day) of the PTWI, and for high level consumers the intake corresponds to 17% (43 µg/day) of the PTWI.

#### Analytical Quality Assurance

Several CRMs were analysed during the survey, as well as frequent participation in PT-rounds. The presented results show acceptable agreement.

### **4.7 Comments on lead in the specific food groups**

All specific results are shown in tables 4.7 – 4.23. The comments are intended to highlight particular/unusual findings and to describe the food groups impact in terms of % PTWI.

#### **Table 4.7: Lead in dairy products, excluding products of category 2: Milk (Cat. 1.1-1.5)**

Data reported by 10 Member States. All mean levels (occurrence) are below the maximum residue level of 0.020 mg/kg for milk decided in EU Decision 466/2001. In FI this food group provides 34% of the total intake of lead. The mean contribution from milk is less than 1% of the PTWI.

#### **Table 4.8. Lead in dairy products, excluding products of category 2: Cheese (Cat. 1.6)**

Data reported by 6 Member States. The mean intake ranges between 0.06 – 2µg/day. The mean contribution from cheese is less than 1% of the PTWI.

#### **Table 4.9. Lead in fats and oils (Cat. 2)**

Data reported by 5 Member States. The levels in food are consistently low, <0.05 µg/g. Its contribution to the daily intake of lead is thus very low. The mean contribution is less than 0.5% of the PTWI.

#### **Table 4.10. Lead in fruit (Cat. 4.1)**

Data reported by 4 Member States. The occurrence data from DK, 0.008 µg/g is by far lower than what is reported by other Member States. The mean contribution is up to 3% of the PTWI.

#### **Table 4.11. Lead in vegetables including mushrooms & fungi, roots, tubers, pulses, legumes, nuts and seeds (Cat. 4.2)**

Data reported by 11 Member States. The occurrence data show a considerable variation and range between 0.004 and 0.6 µg/g. The data from FR and HE also show a large variation

withing the country. When such variations are not caused by agricultural practices, they are indicating that the quality control activities in the reporting laboratory may not be sufficient. Other factors may also play a role. The mean contribution is up to 10% of the PTWI (FR), with the exception of PT with 47% of the PTWI.

**Table 4.12. Lead in confectionary (Cat. 5)**

Data reported by 4 Member States. The occurrence levels in this group are low, as is the consumption. It thus has very little impact on the total intake of lead. The mean contribution is less than 0.5 % of the PTWI.

**Table 4.13. Lead in cereals and cereal products, incl. flours & starches from roots & tubers, pulses & legumes, excluding bakery (Cat. 6)**

Data reported by 10 Member States. As the consumption, on average, is large, its impact on the total intake is considerable, although the mean level in food generally is low, with the exception of Greece and France (see annexes pp. 80). The mean contribution is up to 10% of the PTWI (FR).

**Table 4.14. Lead in bakery wares (Cat 7)**

Data reported by 3 Member States. The food group provides 4 µg to the daily intake in IT. The contribution is less than 1.5% of the PTWI.

**Table 4.15. Lead in meat and meat products, including poultry and game (Cat. 8).**

Data reported by 10 Member States. The contribution to the total intake of lead is generally very small. In HE intake from meat is large, despite the small consumption of only 37 g/day. The occurrence data show an extremely large variation. The highest occurrence results are probably due to lead from gunshot residues (DE). The mean contribution is generally less than 2 % of the PTWI, in DE 4.5% of the PTWI.

**Table 4.16. Lead in offal (8.4)**

Data reported by 10 Member States. The consumption of offal is low in all Member States and its impact on the total intake is very small. It is noteworthy that the occurrence results from GE and HE are on the same level as in meat. The mean contribution is less than 0.5 % of the PTWI

**Table 4.17. Lead in fish and fish products, including molluscs, crustaceans and echinoderms (Cat. 9)**

Data reported by 11 Member States. The occurrence level in fish meat is usually well below 0.1 µg/g. The exception is HE who has reported extremely high levels,  $\leq 0.55$  mg/kg. These results remain to be verified. The mean contribution is generally less than 1% of the PTWI, in HE 6.3% of the PTWI.

**Table 4.18. Lead in eggs and egg products (Cat.10)**

Data reported by 8 Member States. The concentration in eggs is generally very low, with the exception of HE, who has reported a mean concentration of 0.21 mg/kg. The mean contribution is less than 0.5 % of the PTWI



**Table 4.19. Lead in sweeteners, including honey (Cat 11)**

Data reported by 8 Member States. The contribution to the intake is 1 µg/day, or lower. The consumption varies from 0.4 to 63 g/day. The mean contribution is less than 0.5 % of the PTWI

**Table 4.20. Lead in salt, spices, soups, sauces, salads, protein products etc (Cat. 12).**

Data reported by 2 Member States. The contribution to the daily intake is 2-4 µg. The mean contribution is 0.9-1.6 % of the PTWI

**Table 4.21. Lead in non-alcoholic ("soft") beverages (Cat. 14.1)**

Data reported by 8 Member States. The consumption in certain countries is very large, up to 2 kg/day. This food group therefore has a great impact on the daily intake, although the occurrence level is very low, ≤0.02 mg/kg. The contribution is up to 7.5% of the PTWI.

**Table 4.22. Lead in alcoholic beverages, including alcohol-free and low-alcohol (Cat. 14.2)**

Data reported by 6 Member States. Wine is a well known source of lead in our diet, and is the main source in this group. The mean contribution ranges from 0-4.6% of the PTWI

**Table 4.23. Lead in ready to eat (Cat 15)**

Data reported by 2 Member States. Gives no measurable addition to the intake and thus no measurable addition to the PTWI.

**Table 4.7. Lead in dairy products, excluding products of category 2: *Milk* (Cat. 1.1-1.5)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
BELGIUM	238	675	0.0040	0.95	2.70	3	0.4	1.1
DENMARK	357		0.0017	0.59		3.2	0.2	
FINLAND	420		0.005	2.10		34.4	0.8	
FRANCE	158	411	0.002	0.32	0.83	0.56	0.1	0.3
GERMANY*	0.1	0.5	0.014	0.001	0.007	0.006	0.0	0.0
GREECE	112	393	0.012	1.38	4.83	5.49	0.6	1.9
ITALY	130	163	0.007	0.91	1.14		0.4	0.5
NORWAY	463	1141	0.002	0.926	2.28	4.5	0.4	0.9
SWEDEN	344		<0.002	0.344		7.3	0.1	
U. K.	281		0.001	0.28		1	0.1	

- Only milk powder

**Table 4.8. Lead in dairy products, excluding products of category 2: *Cheese* (Cat. 1.6)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
BELGIUM	28.2	71.7	0.026	0.74	1.88	2.0	0.3	0.8
DENMARK	33		0.058	0.19		1.0	0.1	
GERMANY	41.2	111	0.031	1.28	3.45	2.3	0.5	1.4
ITALY	43.2	43.9	0.045	1.94	1.97		0.8	0.8
NORWAY	31	80	0.002	0.062	0.16	0.3	0.0	0.1
SWEDEN	27.5		0.009	0.248		5.2	0.1	
UK	60		0.008	0.48		2	0.2	

**Table 4.9. Lead in fats and oils (Cat. 2)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
DENMARK	48		0.0125	0.60		3.3	0.2	
GERMANY	20.5	50.7	0.036	0.74	1.82	1.1	0.3	0.7
ITALY	19.8	20.5	0.011	0.22	0.22		0.1	0.1
PORTUGAL	9.9	40	0.0485	0.48	1.94		0.2	0.2
U. K.	27		0.005	0.14		<1	0.1	

**Table 4.10. Lead in fruit (Cat. 4.1)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
DENMARK	180		0.0079	1.43		7.8	0.6	
FRANCE*	15.5	85.7	0.049	0.77	4.24	1.35	0.3	1.7
GERMANY	103	293	0.027	2.77	7.9	5.7	1.1	3.2
ITALY	193.7	232.5	0.04	7.75	9.3	23	3.1	3.7
UK	113		0.0105	1.21		<5		

\*Berries, small fruits

**Table 4.11. Lead in vegetables including mushrooms & fungi, roots, tubers, pulses, legumes, nuts and seeds (Cat. 4.2)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
BELGIUM*	335.7	633	0.041	17.39	32.81	42	7.0	13.1
DENMARK	241		0.0106	2.55		14.0	1.0	
FINLAND	149		0.005-0.012	1.72		28.2	0.7	
FRANCE*	338	594 – 64 – 89 -25	0.066-0.226	24.4	39– 6.6 – 8.2- 5.7	43	10.03	2.4- 16.6
GERMANY	250	508	0.03-0.16	10.9	25.3	13.9	4.4	10.1
GREECE**	0.47	0	0.61	0.2867	0	1.14	0.1	
ITALY	254.2	309.6	0.035	8.9	10.84	26.4	3.6	4.3
NORWAY*	255	701	0.052	1.51	3.91	7.3	0.6	1.6
PORTUGAL	332	880	0.004-0.426	117	324	84	46.8	130
SWEDEN*	171		0.009	0.691		14.6	0.3	
U. K*.	266		0.023	3.77		15	1.5	

\*Fruit and vegetables. \*\*Dried and preserved fruit.

**Table 4.12. Lead in confectionary (Cat. 5)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
DENMARK	30		0.0247	0.74		4.1	0.3	
GERMANY	5.86	28.6	0.067	0.39	1.92	0.3	0.2	0.8
NORWAY	10	38	0.004	0.04	0.684	0.2	0.0	0.3
PORTUGAL	1		0.031	0.031		0.02	0.0	

**Table 4.13. Lead in cereals and cereal products, incl. flours & starches from roots & tubers, pulses & legumes, excluding bakery wares (Cat. 6)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
DENMARK	217		0.0108	2.35		12.9	0.9	
FINLAND	2.8		0.029	0.08		1.3	0.0	
FRANCE	62.9	74-116	0.092-0.269	9.63	10.6-20	17	4.1	8.4-4.5
GERMANY*	188	343	0.032	6.01	10.98	10.5	2.4	4.4
GREECE	23	91	0.139	3.197	12.649	12.75	1.3	5.1
ITALY	66	89.2	<0.050-0.014	0.61	1.0	1.8	0.2	0.4
NORWAY	175	359	0.018	2.20	4.77	10.6	0.9	1.9
PORTUGAL	285	30	0.02-0.04	0.54	0.6	4.5	0.2	
SWEDEN	126		<0.005-0.017	1.17		30.2	0.5	
U.K.	101		0.017	2.00		8	0.8	

\*Including bakery wares

**Table 4.14. Lead in bakery wares (Cat 7)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
ITALY	149.5	151.6	0.025	3.74	3.79	11.1	1.5	1.5
PORTUGAL	5.7		0.02	0.114		0,08	0.0	
SWEDEN	15		0.017	0.26		5.4	0.1	
UK	108		0.02	2.00		8	0.8	

**Table 4.15. Lead in meat and meat products, including poultry and game (Cat. 8).**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
DENMARK	136		0.0073	0.99		5.4	0.4	
FINLAND	71.3		0.01-0.03	1.25		20.5	0.5	
FRANCE	148.4	287.9	0.012	1.83	3.56	3.2	0.8	1.5
GERMANY	175	389	0.054-1.32	11.2	23.7	9.7	4.5	9.5
GREECE	37	111	0.1137	4.2069	12.621	16.77	1.7	5.0
IRELAND	87	193	0.02	0.42	0.97		0.2	0.4
ITALY	109.5	48.9	0.038	2.82	5.23	8.4	1.1	2.1
NORWAY	49	115	0.034	3.24	7.38	15.6	1.3	6.2
SWEDEN	101		<0.00-0.035	0.745		15.8	0.3	
U. K.	88		0.0073	1.23		<6	0.5	

**Table 4.16. Lead in offals (8.4)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
BELGIUM	0.17		0.0626	0.01		0	0.0	
FINLAND	3		0.03-0.06	0.14		2.3	0.1	
FRANCE	3.2	21.4	0.044	0.14	0.93	0.25	0.1	0.4
GERMANY	1.95	17.9	0.081	0.16	1.45	0.11	0.1	0.6
GREECE	1.6	8.9	0.1436	0.22976	1.2780	0.92	0.1	0.5
IRELAND	0.876	0	0.0049	0.0043	0		0.0	
ITALY	6.5	28.5	0.18	1.17	5.13	3.5	0.5	2.1
NORWAY	2	11	0.163	0.066	1.07	0.32	0.0	0.4
PORTUGAL	2.185		0.068	0.149		0.11	0.1	
U. K.	1		0.09	0.09		<1	0.0	

**Table 4.17. Lead in fish and fish products, including molluscs, crustaceans and echinoderms (Cat. 9)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
DENMARK	23		0.0070	0.16		0.9	0.1	
FINLAND	53		0.02-0.069	0.48		8.1	0.2	
FRANCE	34.1	14-87	0.023-0.240	1.49	1.7-3.4	2,6	0.63	0.7-1.4
GERMANY	16.9	63.4	0.022-0.099	0.43	1.54	0.94	0.2	0.6
GREECE	36	178	0.214-0.55	13.8	68.3	62.3	5.5	27.3
IRELAND	20	74.9		0.34	1.88		0.1	0.48
ITALY	31.8	48.3	0.04	1.27	1.93	3.8	0.5	0.8
NORWAY	61	190	0.0175	0.97	2.89	4.69	0.4	1.2
PORTUGAL	40		0.051-0.055	2.22		1.97	0.9	
SWEDEN	21.5		<0.006	0.066		1.4	0.0	
U. K.	14		0.02	0.28		<1	0.1	

**Table 4.18. Lead in eggs and egg products (Cat.10)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
DENMARK	21		0.0014	0.03		0.2	0.0	
FINLAND	19		0.01	0.19		3.1	0.1	
FRANCE	20.0	62.9	0.006	0.12	0.38	0.21	0.0	0.2
GERMANY	33.4	81	0.21	0.70	1.70	1.9	0.3	0.7
ITALY	13.8	18.3	0.01	0.14	0.18	0.4	0.1	0.2
NORWAY	17	42	0.025	0.425	1.05	2.0	0.2	0.8
SWEDEN	15		<0.001	0.008		0.2	0.0	
U. K.	14		0.003	0.04		<1	0.0	

**Table 4.19. Lead in sweeteners, including honey (Cat 11)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
BELGIUM	0.37	2.14	0.0958	0.04	0.21	0	0.0	0.1
FINLAND	1.1		0,02	0.02		0.3	0.0	
FRANCE	15.9	49.7	0.030	0.47	1.48	0.83	0.2	0.6
GERMANY	13.0	54.1	0.039-0.104	0.65	2.89	0.72	0.3	1.2
NORWAY	6	30	0.047	0.047	0.282	0.2	0.0	0.1
PORTUGAL	31.3		0.0054	0.169		0.12	0.1	
SWEDEN	0.6		0.038	0.023		0.5	0.0	
U. K.*	63		0.014	1.0		4	0.4	

\*Including preserves

**Table 4.20. Lead in salt, spices, soups, sauces, salads, protein products etc (Cat. 12).**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
FRANCE*	9.3	23.3	0.422	3.92	9.83	6.9	1.6	4.1
GERMANY	2.26	6.0	0.94-1.02	2.17	5.81	0.12	0.9	2.3

Excluding soups

**Table 4.21. Lead in non-alcoholic ("soft") beverages (Cat. 14.1)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
BELGIUM	1014	1718	0.018	18.7	31.6	49	8.7	12.6
DENMARK*	2003		0.0043	8.61		47.2	3.4	
FINLAND	476		0.001	0.48		7.9	0.2	
FRANCE*	931	963-1234	0.0013-0.022	9.03	1.54-21.5	15.9	3.8	0.65-9.05
GERMANY	329	1051	0.003-0.024	2.41	9.24	18.2	1.0	3.7
NORWAY	599	1840	0.011	10.0	25.7	48.2	4.0	10.2
PORTUGAL	26.96	64.25	0.017	0.670	1.61	0.26	0.3	0.6
U. K.	937		0.015	14		54	5.6	

\* Total beverages, including drinking water.

**Table 4.22. Lead in alcoholic beverages, including alcohol-free and low-alcohol (Cat. 14.2)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
BELGIUM	5.73	26.39	0.0124	0.07	0.33	0	0.0	0.1
FRANCE	159.9	628.6	0.029	4.64	18.23	8.2	1.9	7.3
GERMANY*	47	222	0.156	7.32	34.7	2.6	2.9	13.9
ITALY*	84	148.6	0.05	4.2	7.43	12.5	1.7	3.0
NORWAY	94	399	0.0005	0.047	0.20	0.2	0.0	0.1
PORTUGAL	149.3		0.077	11.496		8.25	4.6	
SWEDEN*	39		0.030	1.17		24.8	0.5	

\*Wine only

**Table 4.23. Lead in ready to eat (Cat 15)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake	% of PTWI	
	Mean level	High level		Mean l.	High l.		Mean l.	High l.
NORWAY	2	9	0.004	0.008	0.036	0	0.0	0.0
U. K.	2		0.01	0.02		<1	0.0	

#### 4.8 Estimated daily intake of lead by other population groups

The UK is the only Member State that has complete intake studies for other population groups. The data from the UK and the available data from other Member States are presented in tables 4.24 – 4.27.

**Table 4. 24. Lead Daily Intake ( $\mu\text{g}/\text{day}$ ) by the Mean Adult Population. High Level.**

Food group	BE	FR	DE	HE	IR	IT	NO	PT	Mean
Milk and milk products	2.7	0.83	0.007	4.83		1.14	2.28		2.0
Condensed and milk powder, cheese, yoghurt	1.88		3.45			1.97	0.16		1.8
Fats and oils			1.83			0.22		1.94	1.3
Fruit and vegetables	32.8	4.2-39	33.2	0*		20.1	3.91	324	69
Confectionary			1.92				0.684		1.4
Cereals and bakery wares		10.6-20	11.0	12.6		4.79	4.77		8.3
Meat		3.56	23.7	12.6	1.55	5.23	7.38		8.8
Offal		0.93	1.45	1.28		5.13	1.07		2.0
Fish and fish products		2.04	1.35	54.3	2.01	1.93	2.89		11
Bivalves, crustaceans and cephalopods		1.7-3.4	0.19	13.9			5.79		5.0
Eggs	0.21	0.38	1.70			0.18	1.05		0.82
Sweeteners		1.48	2.89				0.28		1.2
Salt and spices		9.83	5.81						7.7
Beverages	31.9	1.5-21	43.9			0.2	25.9		25
Ready to eat							0.04		

\*Dried fruit and canned vegetable

**Table 4.25. Lead. Daily Intake ( $\mu\text{g}/\text{day}$ ) by Consumers Only. Mean level.**

Food group	BE	FR	DE	HE	IR	NO	UK
Milk, milk products	1.0	0.4	0.01	2.32		0.93	0.24
Condensed and milk powder, cheese, yoghurt	0.8		1.34			0.066	0.42
Fats and oils			0.74				0.12
Fruit and vegetables	1.7-15.8	2.65-19.1	15.7	7.32		1.61	5.94
Confectionary			0.89			0.052	0.25
Cereals and bakery wares		4.62-9.62	6.02	6.95		2.2	4.25
Meat		1.8	41.7	6.37	0.42	3.6	1.19
Offal	0.6	0.8	1.17	4.16	0.10	1.8	1.58
Fish and fish products		0.9	0.65	8.79-22.6	0.54	1.3	0.67
Bivalves, crustaceans and cephalopods		1.4-3.6	1.45	11.4-17.4	4.55	1.4	0.28
Eggs		0.2	0.72			0.42	0.09
Sweeteners	0.4	0.6	1.28			0.24	0.4
Salts and spices		4.1	2.23				
Beverages	18.9	0.7-8.4-6.6	16.9			12	10.33
Ready to eat						0.016	0.05
<b>Total intake</b>			<b>91</b>		<b>5.6</b>	<b>26</b>	<b>24</b>

**Table 4.26. Lead. Daily Intake (µg/day) by Consumers Only. High level.**

Food group	BE	FR	DE	HE	IR	NO	UK
Milk, milk products	2.73	0.9	0.02**	5.28		2.3	0.61
Condensed, powder milk, cheese, yoghurt	1.88		0.35*			0.17	1.35
Fats and oils			1.83				0.3
Fruits and vegetables	4.6-28.3	7.24-39.5	37.3	22.0*		4.1	13.4
Confectionary			2.87			0.16	0.96
Cereals and bakery wares		11.5-23.3	11.0	19.9		4.8	8.94
Meat		3.6	100	15	0.98	8.3	2.78
Offal	0	2.0	2.89	11.2	0.28	5.6	5.52
Fish and fish products		2.2	1.69	20.4-52.2	1.7	3.5	1.97
Bivalve, crustaceans and cephalopods		2.8-8.1	3.64	29.3-44.7	30	6.2	1.1
Eggs		0.4	1.71			1.1	0.24
Sweeteners	2.05	1.5	4.06			0.75	1.34
Salts and spices		10	5.92				
Beverages	32.31	1.6-21.5	59.5			27	25.5
Ready to eat						0.05	0.24
<b>Total intake</b>							<b>43</b>

\*Dried and preserved fruit only \*\*Milk powder only

**Table 4.27. Lead. Daily intake (µg/day) by children in different age groups.**

Age group	Mean population. High level			Consumers only. Mean level			Consumers only. High level		
	3-14	4-6	10-12	3-14	4-6	10-12	3-14	4-6	10-12
<b>FOOD</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>	<b>FR</b>	<b>DE</b>	<b>DE</b>
Milk, milk products**	1.1	0.004	0.007	0.5	0.005	0.009	1.1	0.01	0.017
Condensed, powder milk, cheese, yoghurt		1.9	2.1		0.70	0.79		2.1	2.3
Fats and oils		1.1	1.6		0.46	0.64		1.1	1.6
Fruits and vegetables	2.7-28	20.7	25	1.9-13	9.6	12.0	5.4-28	23.0	28.6
Confectionary		2.3	2.4		0.85	0.99		2.8	2.8
Cereals and bakery wares	12-19	7.2	10.0	5.4-8.4	4.1	5.7	13-21	7.2	10
Meat	2.6	12.3	17.7	1.4	21.0	39.0	2.6	28.0	17.7
Offal	0.5	0.56	1.26	0.6	0.71	1.0	1.5	1.8	2.9
Fish and fish products	1.3	0.63	0.86	0.6	0.35	0.48	1.4	0.91	1.2
Bivalve, crustaceans, cephalopods	0.9-1.7			1.1-2.9	0.73	1.0	3.6-8.2		
Eggs	0.3	1.1	1.2	0.1	0.46	0.55	0.3	1.1	1.2
Sweeteners	0.5	1.6	1.6	0.2	0.73	0.86	0.5	2.25	2.57
Salts and spices	7.6	4.0	4.7	3	1.44	1.8	8.1	4.1	4.8
Beverages	0.3-13	11.6	13.8	0.6-5.2	5.3	5.6	1.2-13	14.5	17.3

\*\* DE: only milk powder



## 4.9 Occurrence summary table for lead

This table contains summaries of occurrence data that has been used in the intake calculation. It provides information on the mean concentration level, median levels where available and min and max values.

**Table 4.28.**

### Lead Occurrence summary data for individual food samples. Unit: mg/kg

Food group code	Food	No. of samples	Reference	Year of sampling	Mean level of lead	Median level of lead	Min	Max
<b>Belgium</b>								
1	Dairy product 1	143			0.0040		< 0.001	0.0248
2	Dairy product 2	74			0.0262		0.0025	0.0540
5	fruit, vegetables 3,1,19	46			0.052		< 0.040	0.326
6	vegetables 3,1,8	8			< 0.040			
7	vegetables 3,1,9,1	18			0.051		< 0.040	0.172
8	Berries	14					< 0.040	
9	fish	154					< 0.02	0.1370
10	bivalves,cephalopods	28					< 0.040	0.401
11	crustaceans	36					< 0.04	0.11
12	bread	4					< 0.040	
13	meat	1128					< 0.040	0.176
14	liver	1089			0.0626	0.0497	< 0.02	0.5510
21	honey	35			0.096		< 0.040	0.533
23	particular foodstuffs	6			0.189		< 0.040	0.466
25	fruit juices	40			0.0184		< 0.020	0.0750
26	wine	15			0.0124	0.0111	< 0.025	0.0271
<b>Denmark</b>								
	Dairy products	21	DK-001	1990	n.d.	n.d.	<0.0007	0.023
	Fruits	440	DK-003	1993-97	0.033	0.015	<0.005	0.719
	Vegetables	796	DK-003	1993-97	0.033	0.011	<0.003	0.719
	Cereals	601	DK-003	1993-97	<0.024	<0.024	<0.024	0.164
	Meat	1409	DK-003	1993-97	<0.015	<0.015	<0.014	0.172
	Fish	766	DK-003	1993-97	<0.009	<0.009	<0.009	0.326
	Eggs	30	DK-003	1993-97	<0.005	<0.005	<0.005	0.006
	Beverages	60	DK-003	1993-97	n.d.	n.d.	<0.003	0.006
<b>Finland</b>								
1.1	milk	52	FI 003	1998	<0.010			
4.2.1	potato	100	FI 101	2000	0.012		<0.005	0.027
4.2.1	carrot	33	FI 102	1993	0.011		0.005	0.041
4.2.1	lettuce	28	FI 102	1993	0.018		0.005	0.063
4.2.1	Chinese cabbage	30	FI 102	1993	0.005		<0.005	0.011
6.3	Muesli products	30	FI 103	1998	0.065		<0.005	0.33
8.1	Meat, reindeer	7	FI 007	2001	0.010		<0.01	0.02
8.1	Meat, bovine	30	FI 006	2001	0.010		<0.01	0.030
8.1	Meat, pig	33	FI 006	2001	0.020		0.010	0.090
8.1	Meat, sheep	3	FI005	2000	0.020		0.010	0.020
8.1	Meat, horse	2	FI 005	2000	0.020		0.010	0.020
8.4	Liver,bovine	31	FI 006	2001	0.050		0.020	0.12
8.4	Liver, pig	34	FI 006	2001	0.050		0.020	0.11
8.4	Liver, elk	11	FI 005	2000	0.060		<0.010	0.39

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Food group code	Food	Number of samples	Reference	Year of sampling	Mean level of lead	Median level of lead	Min	Max
<b>Finland cont.</b>								
8.4	Liver, poultry	13	FI 005	2000	0.070		0.030	0.14
8.4	Kidney, bovine	30	FI 006	2001	0.060		0.020	0.29
8.4	Kidney, pig	30	FI 006	2001	0.020		0.010	0.050
8.4	Kidney, elk	49	FI 006	2001	0.080		0.030	0.27
9.1.1	pike	10	FI 007	2002	0.020		<0.010	0.020
9.1.1	perch	10	FI 007	2002	0.010		<0.010	0.020
9.1.1	Pike perch	10	FI 007	2002	<0.010		<0.010	0.010
9.1.1	bream	4	FI 007	2002	<0.010			
9.1.1	salmon	8	FI 007	2002	<0.010			
9.1.1	vendace	7	FI 007	2002	0.010		0.010	0.030
9.1.1	burbot	7	FI 007	2002	<0.010			
9.1.1	powan	3	FI 007	2002	<0.010			
9.1.1	Baltic herring	32	FI 007	2002	0.010		<0.010	0.010
9.1.2.1	mussels	5	FI 104	2002	0.065		<0.005	0.33
9.1.4.3	shrimp	6	FI 104	2002	0.020		0.007	0.026
9.4	Canned tuna	14	FI 104	2002	0.032		0.005	0.064
10.1	egg	30	FI 002	1997	0.010		<0.010	0.020
11.3	honey	9	FI 004	1999	0.040		<0.010	0.16
14.1.5	Ground coffee (drink)	14	FI 106	1994	0.001			
<b>France</b>							< x = < ½ LOD	
1	Dairy products	349	FR 004	2000-2001	0.002		< 0.00025	0.011
5	Fruits and vegetables	432	FR 006	2000-2001	0.066		< 0.0025	0.500
6	Legumes and pulses	38	FR 006	2000-2001	0.103		< 0.005	0.380
7	Brassica, leafy vegetables, excl. fungi	123	FR 006	2000-2001	0.092		< 0.002	0.415
7 bis	Mushrooms	84	FR 006	2000-2001	0.226		< 0.0025	1.20
8	Berries and small fruits	59	FR 006	2000-2001	0.049		< 0.0025	0.300
10	Cereals and cereal products	85	FR 006	2000-2001	0.269		< 0.0175	1.50
11	Cereals and cereal products cat.2	6	FR 006	2000-2001	0.092		< 0.050	0.200
13	Meat and meat products	6013	FR 004	2000-2001	0.012		< 0.00025	0.247
14	Edible offal	6431	FR 004	2000-2001	0.044		< 0.00025	3.43
15&16	Fish and fish products	892	FR 004-006	2000-2001	0.023		< 0.001	0.600
17	Molluscs	145	FR 004	2000	0.121		< 0.002	0.960
19	Crustaceans	6	FR 006	2000	0.240		0.160	0.430
20	Eggs and egg products	300	FR 004	2000	0.006		< 0.0003	0.054
21	Sweeteners, incl. honey	316	FR 004, 006	2000-2001	0.030		< 0.0125	0.323
22	Salts, spices, sauces, excl. Soups	160	FR 006	2000-2001	0.422		< 0.0015	3.00
24	Water	80	FR 006	2000-2001	< 0.00125		< 0.00125	< 0.00125
25	Non alcoholic beverages	166	FR 006	2000-2001	0.022		< 0.0015	0.127
26	Alcoholic beverages	288	FR 006	2000-2001	0.029		< 0.00125	0.120
<b>Germany</b>								
1.1 and 1.3	milk	148		1997-2002	0.017		<0.006	0.11
1.5	milk powder	51		1998-2000	0.014		<0.01	<0.06
1.6	cheese	240		1997-2001	0.031		<0.006	0.216
2	oil	57		1998-2002	0.036		<0.01	0.66
4.1	fruits	1986		1997-2002	0.027		<0.0015	0.94
4.1.2.2	dried fruits	95		1997-2001	0.049		<0.006	0.25
4.2	nuts and seeds	1173		1997-2002	0.120		<0.006	2.2
4.2	vegetable	3447		1997-2002	0.04		0.002	1.513
4.2	fungi	311		1997-2002	0.16		<0.002	7.335
4.2.2.2	dried vegetables	55		2000-2002	0.754		<0.05	16.1

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Food group code	Food	Number of samples	Reference	Year of sampling	Mean level of lead	Median level of lead	Min	Max
<b>Germany cont.</b>								
4.2.2.2	dried fungi	63		1998-2002	0.653		<0.15	5.12
4.2.2.2	dried algae	11		2000-2002	0.51		0.08	1.5
4.2.2.6	concentrated tomato	61		1999-2001	0.03		<0.006	0.382
5.1	cocoa products	148		1998-2002	0.067		<0.01	0.279
6 and 7	cereals, cereal products, bakery wares	1455		1997-2002	0.032		<0.005	0.751
8.1	fresh meat	840		1997-2002	0.067		<0.006	14
8.1	game	605		1997-2002	1.32		<0.006	188
8.4	offal	3086		1997-2002	0.081		<0.006	1.57
8.5, 8.3, 8.2	processed meat	311		1997-2002	0.054		<0.006	0.876
9.1 without 9.1.2 to 9.1.4	fish	2289		1997-2002	0.022		<0.005	0.57
9.1.2 to 9.1.4	bivalves, crustaceans, squids	620		1997-2002	0.099		<0.006	1.35
10.1	eggs	46		1997-2002	0.021		<0.006	0.259
11.1	sugar	28		1999-2002	0.039		<0.01	0.32
11.3	honey	133		1997-2002	0.07		<0.006	2.74
11.4	sweeteners	32		1998-2000	0.104		<0.01	0.276
12.1	salt	12		1998-2002	0.94		<0.05	2.7
12.2	herbs and spices	501		1997-2002	1.015		<0.006	379.2
13.1, 13.2	infant food	1275		1997-2002	0.035		<0.005	0.34
13.4, 13.5	dietetic food	137		1997-2002	0.791		<0.01	34.8
13.6	food supplements	44		1998-2002	1.57		<0.0022	18
14.1.1	water	2910		1997-2002	0.003		<0.0005	0.6
14.1.2,14.1.3	vegetal juice	28		1997-2002	0.017		<0.01	0.127
14.1.2,14.1.3	fruit juice	195		1998-2002	0.024		<0.006	0.25
14.1.5	tea and coffee	413		1997-2002	0.537		<0.0015	5.83
14.2.1	beer	125		1999-2002	0.007		<0.006	0.081
14.2.3	wine	433		1997-2002	0.156		0.0044	16.8
<b>Greece</b>								
1.1.1	Milk and butter milk	95		2000-2002	0.0123		0.0042	0.1460
4.1.2.2	Dried fruit	4		2000	0.6100	0.5000	0.4100	1.0900
4.2.2.4	Canned vegetables	3		1999-2000	0.7587		0.1490	1.8500
6.1	Whole, broken or flaked grain, incl. Rice	4		2001-2002	0.1390		0.0100	0.3500
8.1.1	Whole pieces or cuts	28		1999-2002	0.1305		0.0230	0.7140
8.1.2	Whole pieces or cuts	21		2001	0.0599	0.0280	0.0094	0.4530
8.3.1.3	Fermented meat	1		1999	0.7750	0.7750	0.7750	0.7750
8.4	Offals	93		1999-2002	0.1437		0.0110	0.8150
9.1.1.30	Small fish eaten whole	10		2001	0.4272	0.1400	0.0100	1.7610
<b>Greece cont.</b>								
9.1.1.30	Bogue	4		2001	0.1400	0.1470	0.0480	0.2650
9.1.1.30	Cuttlefish	3		2001	0.4300	0.4100	0.3910	0.4880
9.1.1.30	Perch	3		2001	0.1620	0.1830	0.0100	0.2040
9.1.1.30	Seabream	3		2001	0.0300	0.0400	0.0100	0.0400
9.1.1.5	Grey mullet	4		2001-2002	0.3328		0.0100	1.1000
9.1.2	Fresh bivalve molluscs	2		2002	0.5565	0.5565	0.4550	0.6580
9.1.2.1	mussels	26		2001-2002	0.3826		0.0990	0.8150
9.1.2.1	Mussels	5		2001-2002	0.8838		0.0630	3.1810
9.1.2.2	Oysters	1		2002	0.5420	0.5420	0.5420	0.5420
9.1.3.2	Squid	2		2001	0.3600	0.3600	0.3570	0.3640
9.1.3.3	Octopus	2		2001	0.2560	0.2560	0.0610	0.4500
9.2.1	Frozen fish, fish fillets and fish products incl.	11		2001-2002	0.1535		0.0100	0.4130
9.4	canned fish	22		1999-2002	1.0113		0.1320	6.8200
9.4.1	Fish canned in oil	1		2002	0.0100	0.0100	0.0100	0.0100
9.4.2	Fish canned in brine (tuna)	4		2001	0.0002		0.0001	0.0005
9.4.2	Fish canned in brine	5		1999	0.4660		0.2500	0.6200

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Food group code	Food	Number of samples	Reference	Year of sampling	Mean level of lead	Median level of lead	Min	Max
<b>Greece cont.</b>								
9.4.3	Fermented fish	6		1999	0.5092		0.4500	0.6200
14.3	Other alcoholic beverages	1		2000	0.2100	0.2100	0.2100	0.2100
<b>Ireland</b>								
	Milk	3		1999	0.05		0.05	0.05
	Dairy powders	147		1995	0.05		<0.02	0.07
	Fruit	6		2001	0.64		0.5	0.89
	Vegetables	1		2001	0.86		0.86	0.86
	Meat	13		1997-2001	0.25		<0.002	<0.05
	Jams	1		2001	0.95		0.95	0.95
	Herbs	17		2001	0.73		0.51	0.96
	Spices	16		2001	0.71		0.06	0.98
	Fish	623		1996-2001	0.02		<0.004	0.13
	Mollusks	3149		1996-2000	0.30		0.02	2.45
	Crustaceans	52		1997-2000	1.01		<0.021	2.9
	Water	34		1999-2001	0.01		0.01	0.01
	Fruit Juices	1		1999	0.05		0.05	0.05
	Hot Beverages	4		2001	0.67		0.54	0.9
	Alcohol	1		2001	0.05		0.05	0.05
	Soups	1		2001	0.53		0.53	0.53
	Food Colour	1		1999	0.05		0.05	0.05
	Juice Powder	1		2001	0.7		0.7	0.7
<b>Italy</b>								
1.1.1	milk	120	IT18-20	1993-1997	0.007		<0.005	0.013
1.1.1	Cow milk	10	IT10	1997	<0.005		<0.005	<0.005
1.6	cheese	25	IT18-20	1993-1997	0.045		0.015	0.15
1.6.2	Pecorino (ewes' milk cheese)	7	IT14	1998	0.019			
1.6.6	Ricotta (ewes' milk cheese)	7	IT14	1998	0.002			
2.1.2	Olive oil	10	IT19	1999	0.0115		0.0074	0.0199
2.1.2	Olive oil	4	IT16	2000-2001	0.0892		0.0337	0.1561
4.1.1	fruits	115	IT18-20	1993-1997	0.040		0.015	0.1
4.2.1	fresh vegetables	80	IT18-20	1993-1997	0.035		0.02	0.1
6.1	soft wheat grain	178	IT8	1996	0.014	0.012	0.005	0.041
6.1	durum wheat grain	239	IT8	1996	0.013	0.012	0.005	0.034
6.1	Rice	42	IT 22	1997-2002	<0.050		<0.050	0.07
6.4	Pasta	11	IT6	2002	0.0047	0.0045	0.0023	0.0085
7.1	bread	25	IT18-20	1993-1997	0.025		<0.010	0.55
8.1	fresh meat	30	IT18-20	1993-1997	0.03		<0.010	0.15
8.2	processed meat	15	IT18-20	1993-1997	0.045		0.019	0.098
8.4	edible offals	65	IT18-20	1993-1997	0.18		0.05	0.4
9.1.1	fresh fish	55	IT18-20	1993-1997	0.08		0.025	0.15
9.1.2.1	mussels	65	IT18-20	1993-1997	0.15		0.055	0.4
9.1.2.1	mussels	30	IT3	1995				
9.1.2.3	Striped venus	1260	IT15	1999	0.12		0.09	0.19
10.1	fresh eggs	15	IT18-20	1993-1996	0.01		<0.010	0.02
11.3	Honey	50	IT5	1999	0.025		0.004	0.141
13.1	Powdered milks for infants	18	IT12	1997	<0.005		<0.005	<0.005
14.2.3	Wine	110	IT18-20	1993-1997	0.06		0.02	0.12
14.2.3	white-red wines	60	IT10	1996-1998	0.042		0.007	0.108
<b>Norway</b>								
1	Dairy products	44		2000-2001	0.0024		0.001	0.025
2	Fats and oils	6		2001	0.001		0.000	0.006
5	Confectionary	6		1999	0.004		0.000	0.019
6	Cereals	269		1995-1997	0.0096		<0.005	0.019
4	Vegetables and fungi	756		1993-1995	0.0057		<0.001	0.016
8	Meat	398		2001-2001	0.0799		0.025	0.395
9	Fish	766		1994-1997	0.0147		0.01	0.05
9	Shellfish	148		1994-2000	0.628		0.008	3.5

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Food group code	Food	Number of samples	Reference	Year of sampling	Mean level of lead	Median level of lead	Min	Max
<b>Norway cont.</b>								
10	Egg	27		2000-2001	0.005		<0.01	0.01
11	Sweeteners	11		1999-2001	0.0155		0	0.2
14	Beverages	94		1999-2001	0.0077		0.0004	0.022
<b>Portugal</b>								
	vegetable oil	26	PT-040,020	2001-2002			<0.001	0.01
	fruits and vegetables	102	PT-10,040,120	1997-2002	0.189		0.012	<1.0
	potato	57	PT-010	1997-2000	0.34		<0.2	<1.0
	fruits and egetables(powder,concentrate and puree)	110	PT-010,020,040	1999-2002	0.082		<0.007	1.8
	chocolate	4	PT-020	2000-2002	0.031		<0.057	<0.080
	cereals and flour	36	PT-020,040	2000-2002	0.040		<0.007	0.373
	breakfast cereals	20	PT-040	2001				0.04
	pasta and noodles	2	PT-040	2000				0.04
	cakes	2	PT-040	2000				0.04
	liver(bovine,caprine,quail,rabbit,chicken,wild boar,ovine,turkey,pork,deer)	258	PT-050	2001	0.132		<0.0012	9.1
	equine liver	15	PT-050	2001	0.267	0.100	0.045	2.0
	fresh fish	194	PT-060	1998-2001	0.055		<0.1	0.3
	bivalves e molluscs	34	PT-020,060	1998-2002	0.051		0.051	0.4
	canned fish,molluscs,bivalves	244	PT-020,060,040,120	1996-2001	0.050		0.001	1
	sugar	281	PT-010,020	1997-2002	0.0054		<0.004	<0.4
	pizza sauce	5	PT-120	1998	0.08		0.008	0.174
	natural mineral waters and source waters	13	PT-030	2000-2001	0.001		<0.0005	<0.005
	Fruit juices	12	PT-020	2001			<0.005	<0.005
	Water based drink	6	PT-020	2002			<0.005	<0.005
	still wine	307	PT-020/PT-070	1999-2002	0.077		0.004	0.435
	Porto wine	247	PT-080/PT-100	2000			0.018	0.453
	Spirituous beverage	5	PT-020	2000-2002			0.168	0.655
<b>Sweden</b>								
1.1-1.5	Dairy products, milk	20	SE 010	1998	<0.002			
1.6	Dairy products, cheese	23	SE 016	1995	0.058		0.004	0.21
4.1-4.2	Fruits and vegetables	146	SE 005,017,018,021	1996-97, 2000-02	0.013		<0.003	0.12
6	Cereals	112	SE 007,010,012,018,022	1997-98, 2000-01	0.009		<0.005	0.057
7	Bakery wares	28	SE 014	1999	0.017		0.006	0.038
8.1-8.3	Meat	334	SE 009,015,023	1994-1997	0.009		<0.002	0.081
8.4	Offals	340	SE 006,009,024	1994-99	0.058		<0.004	0.34
9.1.1	Fish	75	SE 001,020	1993,2001	0.004		<0.006	0.018
10	Egg	5	SE 008	1998	<0.001			
11	Honey	5	SE 004	2001	0.038		<0.004	0.15
12	Spices	4	SE 019	1997	1.2		0.07	4.5
14	Beverages	570	SE 025	1997-98	0.03		-	-
16	Composite foods	4	SE 013	1999	0.019		0.012	0.026
<b>United Kingdom</b>								
	<i>Total Diet Study</i>							
1.2.2.2	Dairy produce	20	UK/010	1997	0.008		<0.002	0.019
1.1	Milk	20	UK/010	1997	0.001		<0.0006	0.0019
2	Oil & fats	20	UK/010	1997	0.005		<0.005	0.019
4.5.11	Sugar and preserves	20	UK/010	1997	0.014		0.006	0.041
4.1.1	Fresh fruit	20	UK/010	1997	0.003		0.001	0.007
4.1.2	Fruit products	20	UK/010	1997	0.018		0.006	0.049
4.2	Green vegetables	20	UK/010	1997	0.061		0.0026	1

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Food group code	Food	Number of samples	Reference	Year of sampling	Mean level of lead	Median level of lead	Min	Max
<b>United Kingdom cont</b>								
4.2	Other Vegetables	20	UK/010	1997	0.015		0.004	0.048
4.2	Potatoes	20	UK/010	1997	0.003		<0.002	0.008
4.2.2.4	Canned vegetables	20	UK/010	1997	0.012		0.003	0.035
6	Miscellaneous cereals	20	UK/010	1997	0.017		0.007	0.061
7.1.1	Bread	20	UK/010	1997	0.020		0.012	0.042
8	Carcase meat	20	UK/010	1997	0.006		0.002	0.015
8	Poultry	20	UK/010	1997	0.005		<0.002	0.013
8.3	Meat Products	20	UK/010	1997	0.011		0.005	0.042
8.4	Offal	20	UK/010	1997	0.090		0.01	0.281
9	Fish	20	UK/010	1997	0.020		0.005	0.048
10	Eggs	20	UK/010	1997	0.003		<0.002	0.012
14	Beverages	20	UK/010	1997	0.015		0.0007	0.07
15.2	Nuts	20	UK/010	1997	0.010		<0.005	0.026
<i>Ad hoc Surveys</i>								
8.4	Offals	92	UK/008/009	1997-1998	0.099		<0.03	1.31
9.1.1	Fish and shellfish	110	UK/003	1996-1997	0.01		0.01	0.02
9.1.2	Fish and shellfish	9	UK/003	1996-1997	0.627		0.04	1.7
9.1.3	Fish and shellfish	3	UK/003	1996-1997	0.01		0.01	0.02
9.1.4	Fish and shellfish	12	UK/003	1996-1997	0.04		0.01	0.1
9.1-other	Cockles and winkles	7	UK/003	1996-1997	0.265		0.05	0.65
9.2.2	Fish and shellfish	3	UK/003	1996-1997	0.01		0.01	0.01
13	Infant foods	96	UK/001/011	1997-1999	0.013		<0.001	0.1
14	Beverages*	91	UK/004/005	1997	0.017		4E-05	0.06
4, 6, 14, 1, 16, 12, 2	Vegetarian foods	99	UK/006/007	1997-1998	0.036		0.004	0.16
1, 7, 16, 15, 9, 1, 8, 4, 12, 14, 6	Snack and convenience foods	298	UK/002	1996-1999	0.019		0.01	0.37

\*Including 4 samples of 5.1(dried chocolate drinks) and 3 samples of 1.1.4 (flavoured milks/yoghurts)

### References for lead in 4.1

1. WHO Food Additives series 2000, 44, (safety evaluation of certain Food Additives and Contaminants), 273-312. Lead. Bolger M.; Carrington C.; Larsen J. C.; Petersen B.
2. Alimentaria 1999, 305, 77-85. Lead toxicology and its presence in food. Rubio C.; Frias I.; Hardisson A.
3. Megen- und Spurenelemente, Arbeitstaging, 19<sup>th</sup>, Jena, Germany, Dec. 3-4, 1999, 95-103. Cadmium and lead in the food chain of industrial point source in Eastern Europe. Willecke-Wetstein, C. Steinbach, J. Luker, E. Bacon, J. Breen.

## 5. DIETARY INTAKE OF MERCURY

### 5.1 Toxicology

Mercury is a toxic element found mostly in fish and fishery products. Methylmercury, the main form in which mercury is present in seafood is the most toxic among mercury species. The methylmercury content in fish and shellfish varies, but it is generally assumed that over 90% is in the form of methylmercury. It may induce alterations in the normal development of the brain of infants and may, at higher levels, induce neurological changes in adults. Children exposed to methyl mercury prior to birth may experience negative effects on their mental development. Therefore, the levels of mercury and methylmercury in food should be as low as reasonably achievable, (taking into account that for physiological reasons certain fish species concentrate mercury more easily in their tissues than others).(ref.1-7)

### 5.2 Recommendations on intake limitations

A PTWI of 0.005 mg/kg (5 µg/kg) bodyweight have been decided for total mercury. This is equal to 0.35 mg/week (350 µg/week) for a person weighing 70 kg. The average intake of total mercury by an adult in the Member States is, according to current information, 5.53 µg/day, which is equal to 38.7 µg/week.

**Table 5. 1. Mercury. Consumption of food in g/day by the mean adult population in the Member States. The figures are based on products for which occurrence data are available.**

Food	BE	DK	FI	FR	DE	HE	IR	IT	NL	NO	PT	SE	UK
Milk, milk products	238	357				112							281
Condensed and milk powder, cheese, yoghurt		33			41								60
Fats and oils		48			21								27
Edible ice													
Fruits and vegetables		421		353	352	0.5*			360				379
Confectionary		30			5.9								
Cereals and bakery wares		217		63**	188	23			220				209
Meat		136			175	37	88						88
Offal						1.6	0.87				2.2		1
Fishmeat	13	23	53	30	16	36	20	32	10	70	40	30	14
Bivalves, crustaceans and cephalopods	1.8			4.7	0.8	5.2	0.05			10	10		
Eggs		21			33								14
Sweeteners					13						31		63
Salt and spices				9.3	2.3				79				
Beverages		2003		1091	376								937
Ready to eat													2
Composite food									282				
<b>Sum</b>	<b>253</b>	<b>3289</b>	<b>53</b>	<b>1551</b>	<b>1227</b>	<b>215</b>	<b>109</b>	<b>32</b>	<b>951</b>	<b>80</b>	<b>83</b>	<b>30</b>	<b>2075</b>

\* dried fruit. \*\* excluding bakery wares

In its sixtieth meeting in Rome, (10-19 June 2003), JECFA established a new PTWI-value for methylmercury, corresponding to 1.6 µg/kg bw, which covers also pregnant women and their fetuses (the previous value was 3.3 µg/kg bw, and did not protect this risk group).

### 5.3 Intake of mercury by the mean adult population

Thirteen Member States submitted data for the mean adult population (BE for 14-18 year olds).

In addition, several Member States submitted data for other population groups (Table 1.1)

The Tables 5.2 - 5.4 report the intakes for 13 food categories.

**Table 5.2 Mercury daily intake (µg/day). Mean Adult population.**

Food	BE	DK	FI	FR	DE	HE	IR	IT	NL	NO	PT	SE	UK	Mean
Milk and dairy products	0.13	0.38			0.165								0.23	<b>0.23</b>
Fats and oils		0.02			0.12								0.08	<b>0.07</b>
Fruits and vegetable		0.61		3.49	3.27				1.05				0.29	<b>1.74</b>
Cereals and bakery ware		0.58		1.16 **	1.32				0.42				0.62	<b>0.82</b>
Meat and offal		0.20			1.62		0.42				0.09		0.21	<b>0.51</b>
Fish and fish products	2.53	0.96	6.2	2.73	2.80	4.51	0.92	8.6	0.19	3.34	13.1	2.7	1.00	<b>3.81</b>
Bivalves, cephalopoda, crustaceans, squid	0.12			0.15	0.02	0.66	0.03			0.72	0.80			<b>0.36</b>
Eggs		0.03			0.17								0.02	<b>0.07</b>
Sweeteners					0.05						0.39		0.19	<b>0.21</b>
Salts, spice				0.49	0.02				0.09					<b>0.2</b>
Beverages		0.73		0.45 *	0.36*								0.37	<b>0.46</b>
Ready to eat													0.01	<b>0.01</b>
Composite food									0.04					<b>0.04</b>
<b>Sum</b>	<b>2.78</b>	<b>3.5</b>	<b>6.2</b>	<b>8.48</b>	<b>9.91</b>	<b>5.17</b>	<b>1.37</b>	<b>8.6</b>	<b>1.79</b>	<b>4.06</b>	<b>14.4</b>	<b>2.7</b>	<b>3.02</b>	<b>5.53</b>

\* Including drinking water. \*\* Excluding bakery ware

No Country reports intake data for all the food categories. DE presents the higher number of food categories (11/13), IT and SE the lower (1/13).

**Table 5.3 Mercury. Weekly intake (µg/week). Mean Adult population.**

Food	BE	DK	FI	FR	DE	HE	IR	IT	NL	NO	PT	SE	UK	Mean
Milk and dairy products	0.88	2.66			1.15								1.61	<b>1.57</b>
Fats and oils		0.14			0.86								0.56	<b>0.52</b>
Fruit and vegetable		4.27		24.4	22.9				7.35				2.03	<b>12.2</b>
Cereals and bakery ware		4.06		8.15* *	9.21				2.94				4.34	<b>5.74</b>
Meat and offal		1.40			11.4		2.94				0.63		1.47	<b>3.56</b>
Fish	17.7	6.72	43.4	19.1	19.6	31.6	6.44	60.2	1.33	23.4	91.7	18.9	7.00	<b>26.7</b>
Bivalves, cephalopods, crustaceans, squid	0.83			1.06	0.12	4.62	0.21			5.04	5.6			<b>2.50</b>
Eggs		0.21			1.17								0.14	<b>0.51</b>
Sweeteners					0.35						2.73		1.33	<b>1.47</b>
Salts and spices				3.44	0.14				0.63					<b>1.4</b>
Beverages		5.11		3.12*	2.52								2.59	<b>3.26</b>
Ready to eat													0.07	<b>0.07</b>



SCOOP 3.2.11 – Intake of As, Cd, Pb and Hg

Composite food									0.28					<b>0.28</b>
<b>Sum</b>	<b>19.4</b>	<b>24.5</b>	<b>43.4</b>	<b>59.3</b>	<b>69.4</b>	<b>36.2</b>	<b>9.59</b>	<b>60.2</b>	<b>12.6</b>	<b>28.4</b>	<b>101</b>	<b>18.9</b>	<b>21.1</b>	<b>38.7</b>

\* Including drinking water. \*\* Excluding bakery wares

**Table 5.4 Mercury. Weekly Intake in % PTWI, by the Mean Adult Population\***

Food	BE	DK	FI	FR	DE	HE	IR	IT	NL	NO	PT	SE	Mean
<b>Mean body weight</b>	<b>60</b>	<b>72</b>	<b>77.1</b>	<b>66.4</b>	<b>70.5</b>	<b>70</b>	<b>75</b>	<b>70</b>	<b>65.8</b>	<b>73</b>	<b>70</b>	<b>73.7</b>	<b>70.3</b>
Milk and dairy products	0.29	0.74			0.33								<b>0.45</b>
Fats and oils		0.04			0.24								<b>0.14</b>
Fruit and vegetable		1.19		7.36	6.49				2.23				<b>4.32</b>
Cereals and bakery ware		1.13		2.46	2.62				0.89				<b>1.78</b>
Meat and offal		0.39			3.22		0.78				0.18		<b>1.14</b>
Fish	5.90	1.87	12.0	5.76	5.56	9.02	1.72	17.2	0.40	6.41	26.2	5.13	<b>8.10</b>
Bivalves, cephalopods, crustaceans, squid	0.28			0.32	0.04	1.32	0.06			1.38	1.6		<b>0.71</b>
Eggs		0.06			0.33								<b>0.19</b>
Sweeteners					0.10						0.78		<b>0.44</b>
Salts e spice				1.04	0.04				0.19				<b>0.42</b>
Beverages		1.42		0.85	0.72								<b>1.00</b>
Ready to eat													
Composite food									0.09				<b>0.99</b>
<b>Sum</b>	<b>6.47</b>	<b>6.81</b>	<b>12.1</b>	<b>17.78</b>	<b>19.7</b>	<b>10.3</b>	<b>2.56</b>	<b>17.2</b>	<b>3.8</b>	<b>7.79</b>	<b>28.8</b>	<b>5.13</b>	<b>18.78</b>

\*UK uses consumer intake estimates for comparison with safety guidelines.

The values of the sum of total mercury intakes, for all countries, are in the range 9.6 µg/week (IR, 3 food categories), and 100.7 µg/week (PT, 4 food categories). This corresponds to 2.56% – 28.8%) of the PTWI, assuming an average weight of 70 kg for a Member States adult. Eleven countries have mercury levels less than 60.3 µg/week, while 2 countries (DE, PT) have respectively 69.4 µg/week and 100.7 µg/week. Regarding the intake for drinking water, it was calculated out of the intakes sum. Two countries present water intake data: FR (0.29 µg/week), DE ( 0.28 µg/week, including the consumption of mineral water)

The mean intake of methylmercury from fish, bivalves, cephalopods, crustaceans and squid is specified in tables 5.2 – 5.3. These data can be used to calculate the intake of methylmercury in relation to the PTWI of 1.6 µg/kg body weight/week for methylmercury (WHO, 2003). The mean intake of mercury from fish and seafood is 29.2 µg/week, taking the mean values for all countries according to Table 5.3. If it is assumed that all of the mercury present in fish is present as methylmercury, the mean intake corresponds to 26% of the PTWI for methylmercury for a person with a body weight of 70 kg. In Tables 5.28 and 5.29 daily mercury intake in consumers only, mean and high level, reported by the UK are shown. From these data it can be calculated that in UK, consumers only, methylmercury intake from fish and shellfish corresponds to 13% of the PTWI for methylmercury. For consumers only, high level, methylmercury intake from fish and shellfish corresponds to 41% of the PTWI for methylmercury. In NO the methylmercury intake by mean consumers corresponds to 73% of the PTWI for methylmercury, whereas for high consumers, methylmercury intake is more than twice the PTWI for methylmercury (e.g.  $(11.0+1.35 \mu\text{g}/\text{day}) \times 7/118 = 0.73$ ;  $(34.06+4.25) \times 7/118 = 2.25$ ). The method used in the Norwegian intake calculation (i.e. intake based on single

point estimates for consumption of each of the relevant foods combined with single point estimates for Hg-concentration in those foods) is known to overestimate the intake, in particular the high-level intakes. However, the results from the SCOOP task indicate that there is a risk that population-groups with a high consumption of fish and seafood may have intakes of methylmercury that are close or even exceed the PTWI of 1.6 µg/kg body weight/week

#### 5.4 Intake of mercury by children: Mean population

Intake data were reported by FR and DE ( BE reported intake data for 14-18 year olds, but they are included in the tables for the mean adult population). The data are shown in Table 5.5, together with data on their percentage of the PTWI for total mercury. Since children have a lower body mass, their body burden per kg bodyweight will generally be larger than that for adults.

The total mercury dietary intake for children in FR is 41.02 µg/week, corresponding to 25.96% of the PTWI (31.6 kg x 5 = 158 µg/week). The dietary intake of the mean adult population in France is 59.4 µg/week, corresponding to 17.88% of the PTWI. The mercury dietary intakes for two children groups in DE are 38.95 and 52.55 µg/week, corresponding respectively to 37.15% and 25.66% of the PTWI (21 kg x 5 = 105 µg/week-age 4-6 years; 41 kg x 5 = 205 µg/week-age 10-12 years). The dietary intake of the mean adult population in Germany is 69.37 µg/week, corresponding to 19.7 % of the PTWI.

The intake of mercury from fish and shellfish can also be compared with the PTWI for methylmercury. For a 4-6 year-old child weighing 21 kg, the PTWI for methylmercury corresponds to 33.6 µg. Similarly, for a 10-12 year-old child the PTWI for methylmercury

**Table 5.5. Total mercury. Intake by children in various age brackets. Mean Population.**

	Daily intake, µg			Weekly intake, µg			% of PTWI		
	Age bracket, year			Age bracket, year			Age bracket, year		
	3-14	4-6	10-12	3-14	4-6	10-12	3-14	4-6	10-12
Food	FR	DE	DE	FR	DE	DE	FR	DE	DE
Milk and milk products									
Condensed, powder milk, cheese, yoghurt		0.081	0.092		0.567	0.637		0.54	0.31
Fats and oils		0.076	0.106		0.532	0.742		0.51	0.36
Fruits and vegetables	2.16	1.81	2.39	15.12	12.67	16.74	9.57	12.11	8.17
Cereals and bakery wares	1.45	0.907	1.24	10.15	6.349	8.68	6.42	6.05	4.23
Meat		0.80	1.267		5.6	8.87		5.33	4.33
Offal		0.004	0.008		0.028	0.056		0.03	0.027
Fish and fish products	1.70	1.273	1.739	11.9	8.91	12.17	7.53	8.48	4.86
Bivalve, crustaceans and cephalopods	0.06	0.004	0.005	0.42	0.028	0.035	0.26	0.03	0.017
Eggs		0.107	0.128		0.75	0.896		0.71	0.44
Sweeteners		0.033	0.036		0.23	0.254		0.21	0.12
Salt and spices	0.34	0.012	0.016	2.38	0.084	0.111	1.51	0.018	0.054
Beverages	0.147	0.453	0.478	1.03	3.169	3.345	0.65	3.02	1.63
<b>Sum</b>	<b>5.86</b>	<b>5.56</b>	<b>7.51</b>	<b>41.02</b>	<b>38.95</b>	<b>52.55</b>	<b>24.4</b>	<b>37.15</b>	<b>25.66</b>

corresponds to 65.6 µg. Using the data from FR and DE in Table 5.5, the percentage of PTWI for methylmercury for children is 26% and 19% for children aged 4-6 and 10-12 years, respectively (as a worst case assuming that all mercury is methylmercury).

Intake data in Table 5.30, shows daily mercury intake in children, consumers only, mean or high level, or mean population, high level. Using these data for comparison with PTWI for methylmercury, gives that PTWI is reached or exceeded in children (e.g. for 10-12 year-old children;  $9.64 \times 7/65.6$ ).

## 5.5 Legislation

In Table 5.6 the MLs for mercury, as defined in The Commission Regulation (EC) No 466/2001, are compared with available occurrence data from the Member States. The occurrence data were collated to give as realistic a picture as possible. They are to some extent an approximation based on many data sets and do not claim to be an “absolute” truth.

**Table 5.6. Mercury. Maximum Levels (ML) in mg/kg, as defined in Commission Regulation (EC) No 466/2001, and compared with occurrence data from the Member States.**

Product	ML	BE	DK	FI	FR	DE	HE	IR	IT	NL	NO	PT	SE	UK
3.3.1	0.5			0.024-0.255 <0.005/ 1.35	0.060 <0.00003 /0.857		<0.01-0.286 0.0015/ 3.70	0.005-0.34 <0.01/ 0.34*	0.07-0.27 0.05/ 0.42	0.01-0.14 0.005/ 0.56	<0.05-0.278 0.01/ 3.14		0.16 0.01/ 1.26	
3.3.1.1	1.0			0.16-0.412 <0.01/ 0.849	0.381 <0.004/ 4.30		0.377 0.268/ 0.432	0.030-0.1667 0.030/ 0.55**	0.21-0.45	0.019-0.28 0.22/ 0.77	0.01-0.598 0.03/ 3.98		0.35 0.01/ 2.2	
Fish. Mean Min/max		0.189 <0.01/ 2.12	0.052 0.011 /0.20			0.173 <0.001/5.8						0.323 0.01/ 1.66		0.016-0.129 0.001/ 0.49
Bivalves, Cephalopods Mean Min/max	0.5	<0.01/ 0.22		0.024 <0.001/ 0.325		0.029 <0.001/0.66						0.0795 0.01/ 0.19		
Crustaceans Mean Min/max	0.5	0.065 <0.01/ 0.159		0.041 0.030/ 0.065										

\*IR. One sample of butterflyfish: 1.05 mg/kg. \*\*IR. One sample of smoked fish: 1.26 mg/kg

## 5.6 Comments on the mean adult population intake of total mercury by Member State:

This section only reports the mean intake of the adult population. Particular findings of interest are highlighted. Consumers, high-risk groups or particular age-segments are not included. A brief comment of the result from each Member State is given. Tables 5.7 – 5.26 provides additional information.

#### BELGIUM

**Estimated intake of mercury:** data for 3 food categories; the most important is fish (17.69 µg – 5.90% PTWI). The sum of the mercury intakes of food categories is 19.4µg/week, corresponding to the 6.47 % of the PTWI. The intake is based on the occurrence of mercury in dairy products, fish and crustaceans. The sum of these food groups intake is 2.78µg/day. Fish represents 91% of this value.

#### **Analytical Quality Assurance**

Certified reference materials have been used extensively as well as participation in proficiency tests. The results showed good correlation between found and certified results.

#### DENMARK

**Estimated intake of mercury:** data for 8 food categories. The most important are fish (6.72µg –1.87 % PTWI ), beverages (5.11 µg – 1.42%PTWI), fruits and vegetables (4.27µg –1.19 %PTWI), cereals and bakery wares (4.06µg –1.13% PTWI). The sum of the mercury intakes of food categories is 24.5 µg/week, corresponding to 6.81 % of the PTWI. The intake is based on the occurrence of mercury in milk, cheese, fats, vegetables, fruits, confectionary, cereals and bread, meat and meat products, fish, eggs and beverages. Total dietary mercury intake was 3.5 µg/day. Fish, beverages and cereals/ bread represent of the total intake about 55%.

#### **Analytical Quality Assurance**

Certified reference materials were analysed in parallel to the samples

#### FINLAND

**Estimated intake of mercury:** Mercury intake for fish is 43.4µg/week of mercury, corresponding to 12.06 % of the PTWI. The intake is based on the occurrence of mercury in several fish species. The sum of these fish species was 6.2 µg/day. The highest contribution to is provided by pike (30.4%).

#### **Analytical Quality Assurance**

Certified reference materials and proficiency tests were used but not reported.

#### FRANCE

**Estimated intake of mercury:** data for 6 food categories. The most important are: fruits&vegetables (24.45 µg/week – 7.36% PTWI), fish (19.12 µg/week –5.76% PTWI).cereals excluding bakery wares (8.15 µg/week – 2.46% PTWI), Salt and spices(3.44 µg/week –1.04% PTWI). The sum of the mercury intakes of food categories is 59.34 µg/week, corresponding to 17.88 % of the PTWI. The intake is based on the occurrence of mercury in fruits and vegetables, mushrooms, cereals and cereal products, fish and fish products, molluscs and cephalopodes, crustaceans, salts, spices, sauces, water, soft beverages and alcoholic beverages. The sum of these food groups intake was 8.48 µg/day. The highest contribution to this value is provided by fruits and vegetables (26.2%), fish and fish products (18.9% + 13.3 % for 3.3.1.1.of regulation 466/2001 + 0.67 % for Molluscs and cephalopods + 1.11% for Crustaceans and echinoderm = 34 % for all the fish and fish products) and mushrooms (15%).

#### **Analytical Quality Assurance**

Certified reference materials have been used extensively as well as participation in proficiency tests. The results showed a good correlation between found and certified results.

#### GERMANY

**Estimated intake of mercury:** data for 11 food categories. The most important are: fruits&vegetables (22.86 µg - 6.48% PTWI), fish (19.6 µg –5.56% PTWI). Cereals and bakery wares (9.21 µg – 2.62% PTWI), meat and offal 11.34µg –3.22% PTWI). The sum of the mercury intakes of

food categories is 69.37 µg/week, corresponding to 18.68% of the PTWI. The intake is based on the occurrence of mercury in cheese, eggs, meat, fish, bivalves, crustaceans, cereals, nut and seeds, fruit and vegetables, dried fruit and vegetables, mushrooms, wine, honey, herbs and spices, sweeteners, game, liver and kidney, concentrated tomato, milk powder, oil, sugar, salt, water. The sum of these food groups intake was 9.91 µg/day. The highest contribution to this value is provided by vegetables, including fungi (33%).

#### **Analytical Quality Assurance**

Certified reference materials have been used extensively as well as participation in proficiency tests. The results showed a good correlation between found and certified results.

#### GREECE

**Estimated intake of mercury:** data for 2 food categories: fish (31.57 µg –9.02% PTWI), bivalve + crustaceans + cephalopoda (4.62 µg –1.32% PTWI). The sum of the mercury intakes of food categories is 36.19 µg/week, corresponding to 10.34 % of the PTWI. The intake is based on the occurrence of mercury in fish, molluscs and crustaceans. The sum of this food groups intake was 5.17 µg/day. Fish of Reg. 466/01 is about the 50% of the sum.

#### **Analytical Quality Assurance**

Laboratories have participated in proficiency tests programs; results regarding use of certified reference materials are reported

#### IRELAND

**Estimated intake of mercury:** data for 3 food categories. The most important is fish (6.44 µg – 1.72% PTWI) The sum of mercury intake of food categories is 9.59 µg/week, corresponding to 2.56 % of the PTWI. The intake estimated on the basis of the occurrence of mercury is 1.37 µg/day in fish, molluscs, crustaceans, meat and offals. Fish represents 67.2% of this value.

#### **Analytical Quality Assurance**

Laboratories have participated in proficiency tests programs; results regarding use of certified reference materials are reported.

#### ITALY

**Estimated intake of mercury:** only data for fish: (60.2 µg/week of mercury,), corresponding to 17.2 % of the PTWI. The intake is based on the occurrence of mercury in fish and molluscs. The sum of this food groups intake was 8.6 µg/day. Fish of Reg. 466/01 represents 58% of this value.

#### **Analytical Quality Assurance**

Certified reference materials have been used as well as participation in proficiency tests. No data regarding correlation between found and certified results are reported.

#### the NETHERLANDS

**Estimated intake of mercury:** data for 5 food categories. The most important is: fruits&vegetables (7.35 µg –2.23 %PTWI), The sum of the mercury intakes of food categories is 12.6 µg/week, corresponding to 3.8 % of the PTWI. The intake is based on the occurrence of mercury in fruits, vegetables, nuts, cereals, bakery wares, fish and fish products, salt, spices, soups, sauces and composite foods. The sum of this food groups intake was 1.79 µg/day. Fruits, vegetables and nuts represent about the 60% of the sum.

#### **Analytical Quality Assurance**

Certified reference materials were analyzed in parallel to the samples, as well as participation in proficiency tests. No data regarding correlation between found and certified results are reported.

#### NORWAY

**Estimated intake of mercury:** data for 2 food categories: fish (23.4µg –6.3% PTWI), bivalve+crustaceans+cephalopoda (5.04µg –1.38% PTWI). The sum of mercury intake of food categories is 28.4µg/week corresponding to 7.79 % of the PTWI. The intake is based on the occurrence of mercury in several fish species. The sum of these fish species intake was 4.06 µg/day. Lake trout represents 20.5% of this value.

#### **Analytical Quality Assurance**

Certified reference materials have been used as well as participation in proficiency tests. No data regarding correlation between found and certified results are reported.

#### PORTUGAL

**Estimated intake of mercury:** data for 4 food categories. The most important are fish (91.7µg –26.2 % PTWI), bivalve +crustaceans+cephalopoda (5.6 µg –1.6% PTWI). The sum of mercury intake of food categories is 100.66 µg/week, corresponding to 28.76 % of the PTWI. The intake is based on the occurrence of mercury in liver, sugar, fresh fish and molluscs. The sum of this food groups intake was 14.38 µg/day. Fresh fish represent 91.6%.

#### **Analytical Quality Assurance**

Certified reference materials have been used as well participation in proficiency tests. Methods validated.

#### SWEDEN

**Estimated intake of mercury:** only data for fish: (18.9µg/week of mercury,), corresponding to 5.13 % of the PTWI. The intake is based on the occurrence of mercury in several fish species. The sum of these fish species intake was 2.7 µg/day. The highest contribution to this value is provided by cod type fish represent 22.6% of the sum.

#### **Analytical Quality Assurance**

Certified reference materials have been used extensively as well as participation in proficiency tests. The results showed a good correlation between found and certified results.

#### UNITED KINGDOM

**Estimated intake of mercury:** data for 10 food categories. The most important categories are: fish (7 µg), cereals and bakery wares (4.34 µg). The sum of the mercury intakes of food categories is 21.14 µg/week. The intake is based on total diet study. Total population intake was 3.02 µg/day. The highest contribution to the intake is provided by fish (33%).

#### **Analytical Quality Assurance**

Certified reference materials have been used extensively as well as participation in proficiency test. The results showed a good correlation between found and certified results.

## 5.7 Comments on total mercury in specific food groups

All specific results are shown in tables 5.7 – 5.26 The comments are intended to highlight particular/unusual findings.

### **Table 5.7. Mercury in Dairy products, excluding products of category 2: Milk (Cat. 1.1-1.5)**

No data for AU, FI, FR, DE, HE, IR, IT, NL, NO, PT, SP, SE.

BE: Total dairy products. FR: dairy products The mean mercury intake was in the range 0.11 µg/day (UK) – 0.35 µg/day (DK). DK presented the only high level intake value: 0.36 µg/day.

### **Table 5.8. Mercury in Dairy products, excluding products of category 2: Cheese (Cat. 1.6)**

No data for AU, BE, FI, FR, HE, IR, IT, NL, NO, PT, SP, SE. The mean mercury intake was in the range 0.03 µg/day (DK) – 0.165 µg/day (DE). DE presented the only high level intake value: 0.446 µg/day

### **Table 5.9. Mercury in Fats and oils (Cat. 2)**

No data for AU, BE, FI, FR, HE, IR, IT, NL, NO, PT, SP, SE. The mean mercury intake was in the range 0.02 µg/day (DK) – 0.123 µg/day (DE). DE presented the only high level intake value: 0.304 µg/day

### **Table 5.10. Mercury in Fruit (Cat. 4.1)**

No data for AU, BE, FI, HE, IR, IT, SP, SE. FR and NL presented intake value referred to total Vegetables +total Fruits, (respectively 2.22+ 1.27 for mushrooms, and 1.05 µg/day. The mean mercury intake was in the range 0.05 µg/day (NO) – 3.49 µg/day (FR). FR and DE presented high level intake (respectively 4.43+ 8.34 for only mushrooms, and 0.585 µg/day). FR and NL: fruits and vegetables.

### **Table 5.11. Mercury in vegetables incl. mushrooms & fungi, roots, tubers, pulses, legumes, nuts and seeds: (Cat. 4.2).**

No data for AU, BE, FI, FR, HE, IR, IT, NL, NO, PT, SP, SE. The mean mercury intake was in the range 0.21 µg/day (UK) – 3.27µg/day (DE).

### **Table 5.12. Mercury in Confectionary (Cat. 5)**

No intake data for all countries.

### **Table 5.13. Mercury in Cereals and cereal products, incl. flours & starches from roots & tubers, pulses & legumes, excluding bakery (Cat. 6)**

No data for AU, BE, FI, HE, IR, IT, NO, PT, SP, SE. DK and DE presented intake value referred to Cereals & Bakery Wares. The mean intake was in the range 0.12 µg/day (NL) – 1.32 µg/day (DE). FR and DE presented high level intake (respectively 3.04, and 2.40 µg/day. DK: cereals+bread, total. DE: cereals+bakery wares.

### **Table 5.14 Mercury in Bakery Wares (Cat 7)**

Data only for NL, UK. The mean intake was, 0.30 µg/day for NL and 0.22 µg/day for UK.

### **Table 5.15. Mercury in Meat and meat products, including poultry and game (Cat. 8).**

No data for AU, BE, FI, FR, HE, IT, NL, NO, PT, SP, SE. The mean mercury intake was in the range 0.20 µg/day (DK) – 1.62 µg/day (DE). IR: meat + offals.

**Table 5.16 Mercury in Offals (Cat. 8).**

No data for AU, BE, DK, FI, FR, HE, IT, NL, NO, SP, SE. The mean mercury intake was in the range 0.087 µg/day (PT) – 0.01 µg/day (UK, DE). DE presented the only high level intake value: 0.09 µg/day

**Table 5.17. Mercury in Fish and fish products, including molluscs, crustaceans and echinoderms (MCE) (Cat. 9)**

No data for AU, SP, DK and DE presented intake value referred to Fish incl. 3.3.1.1 Reg. 466/2001. The mean intake was in the range 0.19 µg/day (NL) – 13.1 µg/day (PT). BE, FR DE, IR, NO presented high level intake (respectively 9.02, 13.12, 10.695, 3.5, 16.08 and µg/day). FR: included 3.3.1.1 reg. 466/2001 (8.16µg/day). HE: included reg. 466/2001 (2.58µg/day). IT: included reg. 466/2001 (5µg/day).

**Table 5.18. Mercury in Bivalve molluscs**

No data for AU, BE, DK, FI, NL, NO, SP, SE. FR, HE, IT presented intake value referred to Bivalve Molluscs & Cephalopodes. DE presented intake value referred to Bivalve Molluscs & Crustaceans. The mean intake was in the range 0.023µg/day (DE) – 0.60 µg/day (UK). FR, DE, HE, NL, and PT presented high level intake in the range 0µg/day (IT) –0.803 µg/day(PT). FR and IT: bivalves molluscs + cephalopodes. DE: bivalve molluscs + crustaceans. HE: fresh bivalve molluscs + fresh cephalopodes

**Table 5.19 Mercury in Crustaceans**

No data for AU, DK, FI, DE, NL, PT, SP, SE, UK. The mean mercury intake was in the range 0.09µg/day (FR) – 0.724 µg/day (NO). BE, FR, HE, IR, NO presented high level intake in the range 0.29 µg/day (IR) –4.17 µg/day(HE).

**Table 5.20. Mercury in Egg and egg products (Cat.10)**

No data for AU, BE, FI, FR, HE, IR, IT, NL, NO, PT, SP, SE. The mean intake was in the range 0.03µg/day (UK) – 0.167 µg/day (DE). DE presented the only high level intake value: 0.405 µg/day

**Table 5.21. Mercury in Sweeteners incl. honey (Cat 11)**

Data only for DE, UK. The mean mercury intake was 0.051 µg/day for DE and 0.19 µg/day for UK..

**Table 5.22. Mercury in salt, spices, soups, sauces, salads, protein products, etc (Cat 12)**

No data for AU, BE, DK, FI, HE, IR, IT, NO, PT, SP, SE, UK. The mean mercury intake was in the range 0.09µg/day (NL) – 0.49 µg/day (FR). FR and DE presented high level intake (respectively 1.23 and 0.05 µg/day. FR: excluding soups

**Table 5.23. Mercury in Non-alcoholic ("soft") beverages (Cat. 14.1)**

No data for AU, BE, FI, HE, IR, IT, NL, NO, PT, SP, SE. The mean intake was in the range 0.18µg/day (FR) – 0.73 µg/day (DK). FR and DE presented the only high level intake value: 0.46 µg/day (FR), 0.84 µg/day (DE). FR and DE presented values for water, respectively 0.042 and n.d?.



DK and UK: total beverages. FR and DE: excluded water. FR: 556g/day – 0.042 µg/day. DE: 260g/day – 0.049 µg/day including mineral water.

**Table 5.24. Mercury in Alcoholic beverages, incl. alcohol-free and low-alcoholic counter (Cat. 14.2)**

FR and DE presented the mean mercury intake values (0.23 µg/day, FR - 0.117 µg/day, DE).

**Table 5.25. Mercury in Ready to eat (Cat 15)**

UK presented the only mean mercury intake value: 0.01 µg/day.

**Table 5.26. Mercury in composite foods (Cat 16)**

Only NL and NO presented mean mercury intake, respectively 0.04 and 4.06µg/day. NO presented the only high level mercury intake value: 18.47 µg/day.

**Table 5.7. Mercury in Dairy products, excluding products of category 2: Milk (Cat. 1.1-1.5)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	238.36	674.73	0.00053	0.127	0.360	5
DENMARK	357		0.0010	0.35		10.0
U. K.	281		0.0004	0.11		4

**Table 5.8. Mercury in Dairy products, excluding products of category 2: Cheese (Cat. 1.6)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	33		0.0009	0.03		0.9
GERMANY	41.35	111.7	0,003-0.004	0.165	0.446	2.3
U. K.	60	175.50	0.002	0.12		4

**Table 5.9. Mercury in Fats and Oils (Cat. 2)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	48		0.0004	0.02		0.6
GERMANY	20.53	50.7	0.006	0.123	0.304	1.1
U. K.	27		0.003	0.08		3

**Table 5.10. Mercury in Fruit (Cat. 4.1)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	180		0.0017	0.31		8.8%
FRANCE*	349.2	695.7	0.006	2.22	4.43	26.2
FRANCE**	3.8	25.0	0.334	1.27	8.34	15
GERMANY	102.5	292.7	0.002	0.205	0.585	5.7
the NETHERLANDS	360		0.003	1.05		58
NORWAY	83.70	279.30	0.001	0.05		
PORTUGAL	78.10	287.50	0.001	0.06		
U. K.	113		0.001	0.08		2

\* excluding mushrooms. \*\* mushrooms only

**Table 5.11. Mercury in Vegetables incl. mushrooms & fungi, roots , tubers, pulses, legumes, nuts and seeds (Cat. 4.2)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	241		0.0012	0.30		8.5%
GERMANY	249.62	507.65	0.002-0.103	3.27	8.03	13.9
U. K.	266		0.00085	0.21		<8

**Table 5.12. Mercury in Confectionary (Cat. 5)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	30		0	0		0
GERMANY	5.86	28.6				0.3

**Table 5.13 Mercury in Cereals and cereal products, incl. flours & starches from roots & tubers, pulses & legumes, excluding bakery (Cat. 6)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	217		0.0027	0.58		16.5%
FRANCE	62.9	164.3	0.019	1.16	3.04	13.7
GERMANY	187.93	343.15	0.007	1.316	2.402	10.5
the NETHERLANDS	42		0.003	0.12		7
U. K.	101		0.004	0.4		13

**Table 5.14. Mercury in Bakery Wares (Cat 7)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
the NETHERLANDS	178		0.002	0.30		17
U. K.	108	261.30	0.002	0.22		7

**Table 5.15. Mercury in Meat and meat products, including poultry and game (Cat. 8).**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	136		0.0015	0.20		5.7%
FRANCE	153.7	291.4				
GERMANY	174.96	389.4	0.004-0.012	1.615	3.64	9.7%
IRELAND	87	193	0.006	0.41	0.94	
U. K.	88		0.002	0.2		<7

**Table 5.16. Mercury in Offals (Cat. 8)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
GERMANY	1.95	17.9	0.005	0.010	0.090	0.11
IRELAND	0.88		0.01	0.009		
PORTUGAL	2.185		0.04	0.0874		
U. K.	1		0.005	0.01		<1

**Table 5.17. Mercury in Fish and fish products, including molluscs, crustaceans and echinoderms (MCE) (Cat. 9)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	13.37	47.79	0.189	2.523	9.019	91
DENMARK	23		0.0417	0.96		27.4
FINLAND	53		0.035-0.380	6.2		100
FRANCE*	29.8	82.9 – 21.4	0.06-0.381	2.73	4.96 – 8.16	32.2
GERMANY	16.9	63.4	0.029-0.173	2.819	10.695	0.94
GREECE	18	71	0.108-0.143	4.513		87.18
IRELAND	23.31	74.86	0.07	0.96	3.5	
ITALY			0.10-0.33	8.6		100
the NETHERLANDS	10		0.019	0.19		11
NORWAY*	70.4	237.6	0.005-1.082	3.3374	18.48	82.1
PORTUGAL	40.5		0.32	13.10		
SWEDEN	30.1		0.02—0.23	2.7		100
U. K.	14		0.043	1.00		33

\* excluding molluscs, crustaceans and echinoderms (MCE)

**Table 5.18. Mercury in Bivalves molluscs**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
FRANCE*	2.4	16.4	0.024	0.06	0.40	0.7
GERMANY	0.78	1.9	0.029	0.023	0.055	0.04
GREECE	2.6	18	0.0234	0.06084	0.4212	1.18
IRELAND	0.084		0.02	0.002		
PORTUGAL	10.1		0.0795	0.0795	0.803	
U. K.	14.00	55.20	0.043	0.60		

\* molluscs and cephalopods

**Table 5.19. Mercury in Crustaceans**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
BELGIUM	1.83	12.75	0.065	0.119	0.829	4
FRANCE	2.3	14.3	0.041	0.09	0.58	1.1
GREECE	2.6	18	0.2318	0.60268	4.1724	11.64
IRELAND	0.57	2.59	0.09	0.05	0.29	
NORWAY	10	37	0.02-1.185	0.724	2.396	17.9

**Table 5.20. Mercury in Eggs and eggs products (Cat.10)**

SCOOP 3.2.11 – Intake of As, Cd, Pb and Hg

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	21		0.0014	0.03		0.9
FRANCE	20.0	62.9				
GERMANY	33.42	81	0.005	0.167	0.405	1.9
U. K.	14		0.001	0.02		<1

**Table 5.21. Mercury in Sweeteners incl. honey (Cat 11)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
FRANCE	15.9	49.7				
GERMANY	13.020	54.050	<0.002-0.004	0,051	0.208	0.72
PORTUGAL	31.3		0.00125	0.391		
U. K.*	63		0.003	0.19		6

\* Sugar and preserves

**Table 5.22. Mercury in Salt, spices, soups, sauces, salads, protein products, etc (Cat 12)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
FRANCE*	9.3	23.3	0.053	0.49	1.23	5.8
GERMANY	2.26	6.0	0.003-0.011	0.020	0.048	0.13
the NETHERLANDS	79		0.001	0.09		5

\* Excluding soups

**Table 5.23. Mercury in Non-alcoholic ("soft") beverages (Cat. 14.1)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
DENMARK	2003		0.0004	0.73		20.8
FRANCE*	373.8	962.9	0.00048	0.18	0.46	2.1
GERMANY	68.89	290	n.d.	0.193	0.841	3.8
GERMANY*	329	1051	n.d.	0.193 0.242	0.841 0.605	3.8 18.2
U. K.	937		0.0004	0.37		12

\* including water

**Table 5.24. Mercury in Alcoholic beverages, incl. alcohol-free and low-alcoholic (Cat. 14.2)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
FRANCE*	159.9	628.6	0.00141	0.23	0.88	2.7
GERMANY*	46.95	222.2	<0.005	0.117	0.556	2.6

\* only wine

**Table 5.25. Mercury in Ready to eat (Cat. 15)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
U. K.	2		0.003	0.01		<1

**Table 5.26. Mercury in composite foods (Cat 16)**

Member State	Consumption (g/day)		Mean level in food (µg/g)	Intake (µg/day)		% of total dietary intake
	Mean level	High level		Mean l.	High l.	
the NETHERLANDS	282		0.0002	0.04		2
NORWAY				4.061*	18.474	100

## 5.8 Estimated daily intake of total mercury by other population groups

The UK is the only Member State that has complete intake studies for other population groups. The data from the UK and the available data from other Member States are presented in tables 5.27 – 5.30.

**Table 5.27. Mercury Daily Intake (µg/day) by the Mean Adult Population.****High Level.**

Food group	BE	FR	DE	HE	IR	NO
Milk and Dairy Products	0.36		0.445			
Fats and oils			0.30			
Fruit and vegetables		4.43 – 8.34	8.63			
Cereals and Bakery Ware		3.04	2.40			
Meat and offal			3.65		0.96	
Fish	9.02	4.96 – 8.16	10.64	17.80	3.5	16.08
Bivalves, cephalopods and crustaceans	0.83	0.4 - 0.58	0.06	4.59	0.28	2.40
Eggs			0.405			
Sweeteners			0.021			
Salt and spices		1.23	0.05			
Beverages		0.09 – 0.46 – 0.88	1.51			

**Table 5.28. Mercury Daily Intake ( $\mu\text{g}/\text{day}$ ) by Consumers Only. Mean level.**

Food group	BE	FR	DE	HE	IR	IT	NO	UK
Milk and milk products	0.132							0.09
Condensed, powder milk, cheese, yoghurt			0.17					0.11
Fats and oils			0.12					0.05
Fruit and vegetables		2.22 – 6.41	3.8					0.30
Confectionary								0.05
Cereals and bakery wares		1.26	1.32					0.71
Meat			1.73		0.42			0.3
Offal			0.07		0.2			0.09
Fish and fish products	4.46	2.18 – 5.77	5.14	10.30	1.41	8.6	11.0	1.44
Bivalves, cephalopods and crustaceans	0.60	0.31 – 0.61	0.42	9.44	0.7		1.35	0.6
Eggs			0.17					0.04
Sweeteners	0.03		0.08					0.08
Salts and spices	0.52	0.52	0.02					
Beverages	0.05	0.04 – 0.18 – 0.32	0.49					0.27
Ready to eat								0.02
<b>Total consumery intake</b>								<b>3.1</b>

**Table 5.29. Mercury Daily Intake ( $\mu\text{g}/\text{day}$ ) by Consumers Only. High level.**

Food group	BE	FR	DE	HE	IR	NO	UK
Milk, milk products	0.365						0.25
Condensed, powder milk, cheese, yoghurt			0.45				0.34
Fats and oils			0.30				0.13
Fruits and vegetables		4.43 – 14.3	9.30				0.59
Confectionary							0.21
Cereals and bakery wares		3.07	2.40				1.64
Meat			3.18		0.95		0.71
Offal			0.18		0.57		0.32
Fish and fish products	10.36	5.4 – 16.3	13.25	23.82	4.1	34.06	4.23
Bivalve, crustaceans and cephalopods	1.90	0.74 – 1.37	1.07	24.24	1.94	4.25	2.37
Eggs			0.41				0.1
Sweeteners			0.25				0.29
Salts and spices		1.25	0.05				
Beverages		0.10 – 0.46 – 1.05	1.81				0.66
Ready to eat							0.07
<b>Total Consumer Intake</b>							<b>6.4</b>

**Table 5.30. Mercury. Daily intake ( $\mu\text{g}/\text{day}$ ) by children in different age groups.**

	Mean population High level		Consumers only Mean level		Consumers only High level	
	4-6 years	10-12 years	4-6 years	10-12 years	4-6 years	10-12 years
<b>FOOD</b>	<b>DE</b>		<b>DE</b>		<b>DE</b>	
Milk, milk products						
Condensed, powder milk, cheese, yoghurt	0.25	0.27	0.09	0.10	0.27	0.29
Fats and oils	0.19	0.275	0.08	0.11	0.19	0.275
Fruits and vegetables	4.38	5.61	2.06	2.76	5.05	6.74
Cereals and bakery wares	1.57	2.18	0.91	1.24	1.58	2.18
Meat	1.86	2.64	0.82	1.27	1.86	2.64
Offal	0.035	0.08	0.04	0.06	0.11	0.18
Fish and fish products	4.95	6.73	2.73	3.78		9.64
Bivalve, crustaceans, cephalopods	0	0	0.21	0.30		
Eggs	0.26	0.29	0.11	0.13	0.26	0.29
Sweeteners	0.05	0.04	0.02	0.03	0.07	0.09
Salts and spices	0.03	0.04	0.01	0.02	0.03	0.04
Beverages						



## 5.9 Occurrence summary table for total mercury

This table contains summaries of occurrence data that has been used in the intake calculation. It provides information on the mean concentration level, median levels where available and min and max values.

**Table 5.31.**

<b>Mercury. Occurrence summary data for individual food samples. Unit: mg/kg.</b>									
Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total Hg	Median level of total Hg	Min	Max
<b>Belgium</b>									
1	Dairy product 1	125				0.000533		< 0.001	0.0038
2	Dairy product 2	91						< 0.004	0.0044
8	wild muscle	2		2001				< 0,01	
9	fish	188				0.188743		< 0.01	2.121
10	bivalves.cephalopods	42						< 0.01	0.221
11	crustaceans	40				0.065054		< 0.01	0.159
15	Dietetic formulae	5		2002		0.034		0.015	0.1
<b>Denmark</b>									
	Meat	566	DK-002	1993-97		<0,007	<0,007	<0,007	0.391
	Fish	225	DK-002	1993-97		0.052	0.051	0.011	0.201
	Eggs	30	DK-002	1993-97		0.002	0.002	0.000	0.007
<b>Finland</b>									
9.1.1	pike	8	FI 007	2002		0.412		0.152	0.849
9.1.1	perch	15	FI 007	2002		0.255		0.078	1.35
9.1.1	sprat	6	FI 007	2002		0.024		0.005	0.030
9.1.1	pike perch	10	FI 007	2002		0.203		0.057	0.369
9.1.1	bream	2	FI 007	2002		0.083		0.08	0.085
9.1.1	salmon	15	FI 007	2002		0.068		0.046	0.096
9.1.1	Rainbow trout	18	FI 007	2002		0.031		<0.005	0.048
9.1.1	vendace	7	FI 007	2002		0.084		0.019	0.137
9.1.1	burbot	7	FI 007	2002		0.240		0.019	0.349
9.1.1	powan	3	FI 007	2002		0.083		0.061	0.096
9.1.1	Baltic herring	32	FI 007	2002		0.035		<0.005	0.107
9.4	Canned tuna	13	FI 104	2002		0.16		<0.05	0.48
<b>France</b>									
4	Fruits and vegetables, excl. Mushrooms	57	FR 006	2000-2001		0.006		< 0.001	0.099
4 bis	Mushrooms	65	FR 006	2000-2001		0.334		0.002	2.40
6	Cereals and cereal products	68	FR 006	2000-2001		0.019		0.003	0.115
9	Fish and fish products	617	FR 004-FR 006	2000-2001		0.060		< 0.0003	0.857
10	3.3.1.1.of regulation 466/2001	142	FR 004-FR 006	2000-2001		0.381		< 0.004	4.30
11	Molluscs and cephalopods	145	FR 004-FR 006	2000-2001		0.024		< 0.0013	0.325
12	Crustaceans and echinoderm	6	FR 006	2000		0.041		0.030	0.065
15	Salts, spices, sauces, excl. Soups	149	FR 006	2000-2001		0.053		< 0.000075	0.590

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Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total Hg	Median level of total Hg	Min	Max
<b>France cont.</b>									
17	Waters	133	FR 006	2000-2001		< 0.000075		< 0.000075	< 0.00008
18	Soft beverages	33	FR 006	2000-2001		0.00048		< 0.000075	0.0025
19	Alcoholic beverages	43	FR 006	2000-2001		0.00141		< 0.000075	0.009
<b>Germany</b>									
1.1 & 1.3	milk	89		1997-2002		0.004		<0.002	<0.01
1.5	Milk powder	9		1998		0.003		<0.005	
1.6	cheese	155		1997-2000		0.004		<0.001	0.02
2	oil	36		1998-2002		0.006		<0.002	0.065
4.1	fruits	104		1997-2001		0.002		<0.0002	0.018
4.1.2.2	dried fruits	28		1997-2001		0.002		<0.001	0.023
4.2	nuts and seeds	483		1997-2002		0.004		<0.001	0.06
4.2	vegetable	626		1997-2002		0.011		<0.0002	1.77
4.2	fungi	203		1997-2002		0.103		<0.001	1.31
4.2.2.2	dried vegetables	53		2000-2002		0.736		<0.002	4.7
4.2.2.2	dried algae	13		2000		0.009		<0.01	0.14
4.2.2.2	dried fungi	36		1998-2002		1.22		0.01	4.45
4.2.2.6	cocentrated tomato	36		2000-2001		0.002		<0.001	<0.01
6 and 7	cereals, cereal products, bakery wares	191		1998-2002		0.007		<0.001	0.49
8.1	fresh meat	574		1997-2002		0.012		<0.001	1
8.1	game	328		1997-2002		0.004		<0.0008	0.05
8.4	offal	1935		1997-2002		0.005		<0.0008	0.1
8.5, 8.3 and 8.2	processed meat	246		1998-2002		0.006		<0.0008	0.25
9.1 without 9.1.2 to 9.1.4	fish	3296		1997-2002		0.173		<0.0008	5.8
9.1.2 to 9.1.4	bivalves, crustaceans, squids	687		1997-2002		0.029		<0.0008	0.66
10.1	eggs	26		1997-2000		0.005		<0.01	0.01
11.1	sugar	12		1998-2001		0.004		<0.01	
11.3	honey	99		1997-2002		0.004		<0.001	0.045
11.4	sweeteners	2		1998-2000		0.002		<0.002	
12.1	salt	5		2001-2002		0.011		<0.002	0.024
12.2	herbs and spices	226		1997-2002		0.003		<0.001	0.051
13.1 & 13.2	infant food	267		1997-2002		0.004		<0.001	0.02
13.6	food supplements	37		1998-2002		0.03		<0.001	0.317
14.1.1	water	2092		1997-2002		0.00019		<0.0001	<0.05
14.1.2 & 14.1.3	fruit juice	21		1998-2000		0.003		<0.002	<0.005
14.1.5	tea and coffee	148		1997-2002		0.01		<0.002	0.041
14.2.3	wine	13		2000		0.003		<0.005	
<b>Greece</b>									
9.1.1	Fresh fish	18		1999-2000		0.1387		0.0250	0.8230
9.1.1.5	Grey mullet	4		2002		0.1275	0.1300	0.1200	0.1300
9.1.1.13	bass	6		1999-2000		0.0478		0.0300	0.0800
9.1.1.28	swordfish	3		2000-2002		0.3773		0.2680	0.4320

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Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total Hg	Median level of total Hg	Min	Max
<b>Greece cont.</b>									
9.1.1.30X1	Chrysophrys auratus	40		1998-2002		0.0619		0.0040	0.1140
9.1.1.30X2	Common Pantora	1		2000		0.1650	0.1650	0.1650	0.1650
9.1.1.30X3	bogue	5		1999-2001		0.0577		0.0205	0.0900
9.1.1.30 X5	Cuttlefish	3		2001		0.1000	0.0520	0.0170	0.2320
9.1.1.30 X6	Perch	3		2001		0.1627	0.1290	0.1140	0.2450
9.1.1.30 X7	Seabream	3		2001		0.1470	0.1300	0.0800	0.2310
9.1.1.30 X8	Small fish eaten whole	10		2001		0.0830	0.0570	0.0350	0.2050
9.1.2.1	Mussels	2		2001		0.0285	0.0285	0.0160	0.0410
9.1.3.2	Squid	2		2001		0.0365	0.0365	0.0350	0.0380
9.1.3.3	Octopus	2		2001		0.0515	0.0515	0.0250	0.0780
9.1.2	Fresh bivalve molluscs	15		2000-2002		0.0231		0.0052	0.0490
9.1.2.1	Mussels	54		2001-2002		0.0215		0.0015	0.0310
9.1.2.2	Oysters	1		2002		0.0120	0.0120	0.0120	0.0120
9.1.3	Fresh cephalopodes	1		2001		<0.01			
9.1.3.2	Octopus	2		2000		0.0450	0.0450	0.0200	0.0700
9.1.4	Fresh crustaceans	2		1998		0.2500	0.2500	0.2000	0.3000
9.1.4.2	Lobsters	1		2000		0.1010	0.1010	0.1010	0.1010
9.1.4.3	shrimp	6		1999		0.2476	0.2300	0.1657	0.3900
9.2.1	Frozen fish, fish fillets and fish products incl. MCE	580		1999-2002		0.1200		<0.003	3.7020
9.4	canned fish	17		1999		0.2721		0.0100	0.4700
9.4.1	Fish canned in oil	28		1999-2002		0.1020		0.0030	0.4500
9.4.2	Fish canned in brine	22		1999-2002		0.0992		<0.003	0.6150
9.4.3	Fermented fish	136		1999-2002		0.0652		<0.003	0.5450
9.4.4.X1	Smoked hering	3		2000-2002		0.0457		0.0370	0.0630
<b>Ireland</b>									
	acid casein powder	43		1995		0.0050		< 0.01	< 0.01
	rennet casein powder	33		1995		0.0050		< 0.01	< 0.01
	skim milk powder	71		1995		0.0050		< 0.01	< 0.01
	Beef	125		1997		0.0050		< 0.01	< 0.01
	Beef (Muscle, Liver, Kidney)	89		2000 - 2001		0.0037		< 0.001	< 0.02
	Lamb (Muscle, Liver, Kidney)	22		2000 - 2001		0.0053		< 0.001	< 0.02
	Pork	100		1997		0.0050		< 0.01	< 0.01
	Pork (Muscle, Liver, Kidney)	10		2000		0.0005		< 0.001	< 0.001
	Poultry	28		2000 - 2001		0.0088		< 0.015	< 0.02
	FARM GAME LIVER	7		2001		0.0100		< 0.02	< 0.02
	Anchovies	1		2001		0.0500		0.0500	0.0500
	Black jack	10		1998		0.0400		0.0400	0.0400
	Black sole	99		1996 - 2000		0.0830		0.0300	0.2100
	Butterfish/Bass	1		2001		1.0500		1.0500	1.0500
	C.Gigas	724		1996 - 2000		0.0279		0.0200	0.0500
	Cod	193		1996 - 2001		0.0634		0.0100	0.1900

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Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total Hg	Median level of total Hg	Min	Max
<b>Ireland cont.</b>									
	Cuckoo ray	30		1996		0.0800		0.0700	0.0900
	Forkbeard	10		1997		0.0900		0.0900	0.0900
	Gurnard	10		1999		0.0900		0.0900	0.0900
	Haddock	154		1996 - 2001		0.0795		0.0100	0.2700
	Hake	82		1996 - 2001		0.0790		0.0300	0.1500
	Herring	32		1996 - 2001		0.0760		0.0400	0.1000
	John dory	10		1996		0.0700		0.0700	0.0700
	Kipper Fillets	2		2001		0.0400		0.0200	0.0600
	Lemon sole	71		1996 - 2001		0.0713		0.0300	0.1400
	Ling	49		1996 - 2000		0.1680		0.1100	0.2900
	LOBSTER	1		2001		0.3400		0.3400	0.3400
	M.edulis	2150		1996 - 2000		0.0209		0.0200	0.0400
	Mackerel	129		1996 - 2001		0.0410		0.0200	0.0800
	Megrim	110		1996 - 2000		0.0900		0.0200	0.3300
	monk/angler fish	90		1996 - 2000		0.1267		0.0800	0.1800
	Norway lobster	50		1996		0.0900		0.0800	0.1000
	O.edulis	300		1996 - 2000		0.0309		0.0200	0.0500
	Plaice	187		1996 - 2001		0.0474		0.0100	0.1000
	Pollack	10		1996		0.0500		0.0500	0.0500
	Pollock	19		2000		0.1250		0.0500	0.2000
	Prawns	121		1997 - 2001		0.1143		0.0200	0.2400
	Rainbow Trout	1		2001		0.0500		0.0500	0.0500
	Saithe	5		1999		0.2500		0.2500	0.2500
	Salmon	321		1999 - 2001		0.0381		0.0200	0.0900
	Salmon (tinned)	1		2001		0.0200		0.0200	0.0200
	Sardines	4		2001		0.0263		0.0200	0.0500
	Scottish Brisling	1		2001		0.0200		0.0200	0.0200
	Skate/Ray	45		1998 - 2000		0.0800		0.0300	0.1000
	Skippers	1		2001		0.0500		0.0500	0.0500
	Sole Fillet Loose	1		2001		0.0200		0.0200	0.0200
	Torsk	9		1999		0.1600		0.1600	0.1600
	Trout	51		1999 - 2001		0.0459		0.0256	0.1000
	Tuna	14		1998 - 2001		0.1667		0.0600	0.5500
	Tuna (tinned)	1		2001		0.0300		0.0300	0.0300
	White Crab Meat	2		2001		0.0850		0.0700	0.1000
	White sole	20		1996		0.2000		0.1300	0.2700
	Whiting	161		1996 - 2001		0.0733		0.0100	0.2000
	Witch	20		2000		0.0850		0.0800	0.0900
	Wolf-fish	10		1999		0.1900		0.1900	0.1900
	Cod (processed)	28		2001		0.0280		0.0100	0.0600

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Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total Hg	Median level of total Hg	Min	Max
<b>Ireland cont.</b>									
	Crab Flakes	1		2001		0.0050		< 0.01	< 0.01
	Fish portions, fingers, etc.	9		2001		0.0156		<0.0100	0.0500
	Frozen Fish	1		2001		0.0300		0.0300	0.0300
	Frozen Prawns	1		2001		0.0900		0.0900	0.0900
	Salmon Pate	1		2001		0.0300		0.0300	0.0300
	Whiting	2		2001		0.0200		0.0200	0.0200
	Kippers	1		2001		0.0400		0.0400	0.0400
	Roolmop Herring	1		2001		0.0100		0.0100	0.0100
	Smoked Fish	1		2001		1.2600		1.2600	1.2600
	Smoked Haddock	2		2001		0.1400		0.1000	0.1800
	Smoked Kippers	5		2001		0.0520		0.0100	0.0800
	Smoked Mackerel	9		2001		0.0622		0.0300	0.0900
	Smoked Mussels	1		2001		0.0050		< 0.01	< 0.01
	Smoked Salmon	2		2001		0.0350		0.0200	0.0500
	Smoked Tuna	1		2001		0.0300		0.0300	0.0300
	Woodoak Smoked Sprat	1		2001		0.0500		0.0500	0.0500
	Brisling (tinned)	1		2001		0.0400		0.0400	0.0400
	Mackerel (tinned)	1		2001		0.0400		0.0400	0.0400
	Pink Salmon	5		2001		0.0320		0.0200	0.0500
	Red Salmon	5		2001		0.0460		0.0200	0.0800
	Salmon (tinned)	3		2001		0.0217		0.0300	0.0300
	Sardines (tinned)	5		2001		0.0430		0.0400	0.0700
	Tuna (tinned)	14		2001		0.1071		0.0100	0.2900
	Cinnamon	1		2001		0.0100		0.0100	0.0100
	Tuna Salad	1		2001		0.0300		0.0300	0.0300
	Haddock & Pasta Bake	1		2001		0.0400		0.0400	0.0400
<p><i>Note: Table does not include all occurrence data (excluded are not quantified data and data from highly contaminated areas. For these please see main table in the Annex</i></p>									
<b>Italy</b>									
9.1.3.2	Spider octopus	300	IT-011	1997		0.27		0.18	0.42
9.1.3.1	Broadtail squid	212	IT-011	1997		0.07		0.05	0.12
9.1.1.29	Tuna	97	IT-017	1997		0.21*			
9.1.1.25	Shark ( <i>all species</i> )	54	IT-017	1997		0.45*			
9.1.3.1	Calamary	109	IT-017	1997		0.09*			
9.1.3.2	Octopus	118	IT-017	1997		0.11*			
9.1.3.3	Cuttle-fish	92	IT-017	1997		0.10*			
9.1.3.1	Squid	45	IT-017	1997		0.13*			
9.1.4.3	Prawn & shrimp	111	IT-017	1997		0.10*			
9.1.1.30	Cod & hake	233	IT-017	1997		0.12*			
9.1.1.30	Sole	106	IT-017	1997		0.11*			
9.1.1.30	Plaice	11	IT-017	1997		0.10*			
9.1.1.30	Salmon	12	IT-017	1997		0.09*			
9.1.1.8	Pilchard	164	IT-017	1997		0.11*			

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Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total Hg	Median level of total Hg	Min	Max
<b>Italy cont.</b>									
9.1.1.9	European anchovy	198	IT-017	1997		0.09*			
9.1.1.30	Mackerel	61	IT-017	1997		0.13*			
9.1.2.1	Mussel	209	IT-017	1997		0.10*			
9.1.2.3	Venus & Carpet shell	96	IT-017	1997		0.08*			
9.1.4.3	Squill or mantis shrimp	720	IT-004	1998		0.14		0.05	0.23
<b>the Netherlands</b>									
	anchovy	1	NL/003	1998		0.05			
	anchovy	10	NL/003	2001		0.051	0.045	0.01	0.13
	flounder	1	NL/003	1999		0.14			
	trout	2	NL/003	1999		0.015	0.015	0.01	0.02
	shrimp	6	NL/003	1999		0.027	0.03	0.02	0.03
	mixed vegetables	1	NL/003	1998		0.003			
	herring	1	NL/003	1998		0.04			
	herring	2	NL/003	1999		0.03	0.03	0.03	0.03
	herring	8	NL/003	2001		0.032	0.03	0.1	0.08
	heek	2	NL/003	1999		0.05	0.05	0.04	0.06
	squid	1	NL/003	1998		0			
	Squid	1	NL/003	1999		0.01			
	squid	3	NL/003	2001		0.03	0.03	0.01	0.05
	cod fish	4	NL/003	1999		0.062	0.055	0.03	0.11
	crab	1	NL/003	1997		0.033			
	crab	3	NL/003	2001		0.05	0.05	0.04	0.06
	mackerel	3	NL/003	1998		0.034	0.03	0.02	0.052
	mackerel	1	NL/003	1999		0.02			
	mackerel	5	NL/003	2001		0.04	0.03	0.01	0.08
	Nile perch	1	NL/003	1999		0.06			
	oysters	1	NL/003	2001		0.01			
	other shellfish	1	NL/003	2001		0.02			
	other fish products	3	NL/003	1997		0.02	0.03	0.005	0.03
	other fish products	1	NL/003	1999		0.03			
	other fish products	16	NL/003	2001		0.037	0.02	0.005	0.17
	other fish species	13	NL/003	1999		0.085	0.05	0.01	0.34
	other fish species	5	NL/003	2001		0.155	0.08	0.005	0.42
	other fish species	9	NL/003	2002		0.314	0.31	0.2	0.56
	eel	3	NL/003	1999		0.057	0.04	0.02	0.11
	eel	1	NL/003	2001		0.08			
	gurnard	1	NL/003	1999		0.16			
	sardines	3	NL/003	1997		0.035	0.037	0.029	0.038
	sardines	4	NL/003	1998		0.071	0.086	0.01	0.101
	sardines	26	NL/003	2001		0.03	0.01	0.01	0.16
	dab	7	NL/003	1999		0.08	0.08	0.02	0.15
	haddock	1	NL/003	2001		0.01			
	haddock	3	NL/003	1999		0.05	0.05	0.04	0.06
	plaice	9	NL/003	1999		0.038	0.04	0.02	0.06
	St jacob shells	1	NL/003	1999		0.01			
	lemon sole	6	NL/003	1999		0.063	0.04	0.01	0.19
	tuna	4	NL/003	1997		0.123	0.138	0.036	0.178
	tuna	4	NL/003	1998		0.019	0.19	0.03	0.035
	tuna	1	NL/003	1999		0.28			
	tuna	14	NL/003	2001		0.196	0.105	0.05	0.77
	whiting	3	NL/003	1999		0.043	0.02	0.02	0.09

SCOOP 3.2.11 – Intake of As, Cd, Pb and Hg

Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total Hg	Median level of total Hg	Min	Max
<b>the Netherlands cont.</b>									
	salmon	5	NL/003	1997		0.036	0.037	0.031	0.04
	salmon	1	NL/003	1999		0.02			
	salmon	3	NL/003	2001		0.043	0.04	0.01	0.08
<b>Norway</b>									
9	Saltwater fish	580		1994-2000		0.0595		0.004	0.26
9	Freshwater fish	1135		1997-2001		0.2936		0.024	3.98
9	Shellfish	75		1994-1996		0.0908		0.02	0.191
<b>Portugal</b>									
	tomate paste	1	PT-040	2001		0.03	0.03	0.03	0.03
	cereal flour	7	PT-050	200-2001		0.056		0.03	0.09
	breakfast cereals	10	PT-040	2001				0.001	0.003
	bread	3	PT-040	2001				0.001	0.062
	liver(bovine,caprine,quail,rabbit,chicken,wild boar, ovine, turkey, pork, deer equine)	274	PT-050	2001		0.03		0.01	0.10
	fresh fish	515	PT040,020,061,110,064,062,063,064	1998-2002		0.3235		0.01	1.66
	bivalves e molluscs	62	PT-020,061,110,062	1998-2002		0.0795		0.01	0.19
	canned fish	7370	PT-020,065,110,120,040	1990-2002				<0.005	1.27
	sugar	11	PT-020	2002		<0.025	<0.025	<0.025	<0.025
	salt	9	PT-040	2000					0.03
<b>Sweden</b>									
9.1.1	Fish	333	SE 002.003	1992-93, 2001		0.21		0.01	2.2
<b>United Kingdom</b>									
Total Diet Study									
1.2.2.2	Dairy produce	20	0	1997		0.002		<0.001	0.002
1.1	Milk	20	0	1997		0.0004		<0.0004	0.0004
2	Oil & fats	20	0	1997		0.003		<0.003	0.004
4.1.1	Fresh fruit	20	0	1997		0.0006		<0.00006	0.0006
4.1.2	Fruit products	20	0	1997		0.0008		<0.0006	0.003
4.2	Green vegetables	20	0	1997		0.0004		<0.0004	0.0005
4.2	Other Vegetables	20	0	1997		0.0006		<0.0006	0.0008
4.2	Potatoes	20	0	1997		0.001		<0.001	<0.001
4.2.2.4	Canned vegetables	20	0	1997		0.0009		<0.0006	0.0067
4, 5, 11	Sugar and preserves	20	0	1997		0.003		<0.003	<0.003
6	Miscellaneous cereals	20	0	1997		0.004		<0.001	0.009
7.1.1	Bread	20	UK/010	1997		0.002		<0.001	0.004
8	Carcass meat	20	UK/010	1997		0.001		<0.001	0.003
8	Poultry	20	UK/010	1997		0.002		<0.001	0.006
8.3	Meat Products	20	UK/010	1997		0.003		0.002	0.006
8.4	Offal	20	UK/010	1997		0.0052		0.002	0.0103
9	Fish	20	UK/010	1997		0.043		0.017	0.092
10	Eggs	20	0	1997		0.0013		<0.0009	0.0028
14	Beverages	20	0	1997		0.0004		<0.0004	<0.0004
15.2	Nuts	20	0	1997		0.003		<0.003	<0.003
Ad hoc									
9.1.1	Fish and Shellfish	110	UK/003	1996-1997	0.08			0.016	0.24
9.1.2	Fish and Shellfish	9	UK/003	1996-1997	0.03			0.008	0.11

## SCOOP 3.2.11 – Intake of As, Cd, Pb and Hg

Food group code	Food name	No. of samples	Reference	Year of sampling	Type of water <sup>1</sup>	Mean level of total Hg	Median level of total Hg	Min	Max
<b>United Kingdom cont.</b>									
9.1.3	Fish and Shellfish	3	UK/003	1996-1997	0.04			0.016	0.058
9.1.4	Fish and Shellfish	12	UK/003	1996-1997	0.129			0.051	0.49
9.1 - other <sup>2</sup>	Fish and Shellfish	7	UK/003	1996-1997	0.032			0.001	0.046
9.2.2	Fish and Shellfish	3	UK/003	1996-1997	0.016			0.006	0.025
13	Infant Foods	96	UK/001/011	1997-1999	0.001			<0.0003	0.01
14	Beverages <sup>3</sup>	91	UK/004/005	1997	0.002			0.00002	0.03
4, 6, 14, 1, 16, 12, 2	Vegetarian Foods	99	UK/006/007	1997-1998	0.005			0.001	0.008
1, 7, 16, 15, 9, 1, 8, 4, 12, 14, 6	Snack and Convenience foods	298	UK/002	1996-1999	0.007			0.005	0.082

<sup>1</sup> Upper bound mean. <sup>2</sup> Cockles and winkles. <sup>3</sup> Including 4 samples of 5.1(dried chocolate drinks) and 3 samples of 1.1.4 (flavoured milks/yoghurts)

### References for mercury in 5.1

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## 6. Food Categorisation System

Code	Description
<b>0</b>	<b>Food in general, unless otherwise specified</b>
<b>1</b>	<b>Dairy products, excluding products of category 2</b>
1.1	Milk and dairy-based drinks
1.1.1	Milk and buttermilk
1.1.2	Milk, incl. sterilised and UHT goats milk
1.1.3	Buttermilk (Plain)
1.1.4	Dairy-based drinks, flavoured and/or fermented (e.g. chocolate, milk, cocoa, eggnog)
1.2	Fermented and renneted milk products (plain) excluding drinks
1.2.1	Fermented milks (plain)
1.2.2	Non heat-treated after fermentation
1.2.3	Heat-treated after fermentation
1.2.4	Renneted milk
1.3	Condensed milk (plain) and analogues
1.3.1	condensed milk (plain)
1.3.2	Beverage whiteners
1.4	Cream (plain) and the like
1.4.1	Pasteurised cream
1.4.2	Sterilised, UHT, whipping or whipped cream and reduced fat creams
1.4.3	Clotted cream
1.4.4	Cream analogues
1.5	Milk powder and cream powder (plain)
1.5.1	Milk and cream powder
1.5.2	Powder analogues
1.6	Cheese
1.6.1	Unripened cheese
1.6.2	Ripened cheese
1.6.3	Total ripened cheese, includes rind
1.6.4	Rind of ripened cheese
1.6.5	Cheese powder (for reconstitution; e.g., for cheese sauces).
1.6.6	Whey cheese
1.6.7	Processed cheese
1.6.8	Cheese analogues
1.7	Dairy-based desserts (e.g. ice cream, ice milk, pudding, fruit or flavoured yoghurt)
1.8	Whey and whey products, excl. whey cheese
<b>2</b>	<b>Fats and oils, and fat emulsions (type water-in-oil)</b>
2.1	Fats and oils essentially free from water
2.1.1	Butter oil, anhydrous milk fat, ghee
2.1.2	Vegetable oils and fats
2.1.3	Lard, tallow and fish oil, and other animal fats
2.2	Fat emulsions mainly of type water in oil
2.2.1	Emulsions containing at least 80% fat
2.2.2	Butter and concentrated butter
2.2.3	Margarine and similar products (e.g. butter-margarine blends)
2.2.4	Emulsions containing less than 80% fat (e.g. minarine)
2.3	Fat emulsions other than 2.2, incl. mixed and/or flavoured products based on fat emulsions.
2.4	Fat based desserts (excl. dairy based desserts)
<b>3</b>	<b>Edible ices, including sherbet and sorbet</b>
<b>4</b>	<b>Fruits and vegetables (incl. mushrooms &amp; fungi, roots and tubers, pulses and legumes), and nuts &amp; seeds</b>
<b>4.1</b>	<b>Fruit</b>
4.1.1	Fresh fruit
	Untreated fruit
	Surface-treated fruit
	Peeled or cut fruit
4.1.2	Processed fruit
4.1.2.1	Frozen fruit

- 4.1.2.2 Dried fruit
- 4.1.2.3 Fruit in vinegar, oil or brine
- 4.1.2.4 Canned or bottled (pasteurised) fruit
- 4.1.2.5 Jams, jellies, marmalades
- 4.1.2.6 Fruit-based spreads other than 4.1.2.5 (e.g. chutney)
- 4.1.2.7 Candied fruit
- 4.1.2.8 Fruit preparations, incl. pulp and fruit toppings
- 4.1.2.9 Fruit-based desserts, incl. fruit-flavoured water-based desserts
- 4.1.2.10 Fermented fruit products
- 4.1.2.11 Fruit fillings for pastries
- 4.1.2.12 Cooked or fried fruit
- 4.2 Vegetables incl. mushrooms & fungi, roots & tubers, pulses and legumes), and nuts & seeds**
- 4.2.1 Fresh vegetables
  - Untreated vegetables
  - Surface-treated vegetables
  - Peeled or cut vegetables
- 4.2.2 Processed vegetables, and nuts and seeds
  - 4.2.2.1 Frozen vegetables
  - 4.2.2.2 Dried vegetables
  - 4.2.2.3 Vegetables in vinegar, oil or brine
  - 4.2.2.4 Canned or bottled (pasteurised) vegetables
  - 4.2.2.5 Vegetable, and nut & seed purees and spreads (e.g. peanut butter)
  - 4.2.2.6 Vegetable, and nut & seed pulps and preparations other than 4.2.2.5
  - 4.2.2.7 Fermented vegetable products
  - 4.2.2.8 Cooked or fried vegetables

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- 5 Confectionery**
- 5.1 Cocoa products and chocolate products incl. limitations and chocolate substitutes
  - Cocoa mixes (powders and syrups)
  - Cocoa based spread, incl. fillings
  - Imitation chocolate, chocolate substitute products
- 5.2 Sugar based confectionery other than 5.1, 5.3 and 5.4, incl. hard and soft candy, nougats, etc.
- 5.3 Chewing gum
- 5.4 Decorations (e.g. for fine bakery wares), toppings (non-fruit) and sweet sauces.

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- 6 Cereals and cereal products, incl. flours & starches from roots & tubers, pulses & legumes, excluding bakery.**
- 6.1 Whole, broken or flaked grain, incl. rice
- 6.2 Flours and starch
- 6.3 Breakfast cereals, incl. rolled oats
- 6.4 Pastas and noodles
- 6.5 Cereal and starch-based desserts (e.g. rice pudding, tapioca pudding)
- 6.6 Batters (e.g. for breading or batters for fish or poultry)

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- 7 Bakery wares**
- 7.1 Bread and ordinary bakery wares
  - 7.1.1 Breads and rolls
  - 7.1.2 Crackers, excluding sweet crackers
  - 7.1.3 Other ordinary bakery products (e.g. bagels, pita, English muffins)
  - 7.1.4 Bread-type products, incl. bread stuffing & bread crumbs
- 7.2 Fine bakery wares
  - 7.2.1 Cakes, cookies and pies (e.g. fruit-filled or custard types)
  - 7.2.2 Other fine bakery products (e.g. doughnuts, sweet rolls, scones and muffins)
  - 7.2.3 Mixes for fine bakery wares (e.g. cakes, pancakes)

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- 8 Meat and meat products, including poultry and game**
- 8.1 Fresh meat, poultry and game
  - 8.1.1 Whole pieces or cuts
  - 8.1.2 Comminuted
- 8.2 Processed meat, poultry and game products in whole pieces or cuts
  - 8.2.1 Non-heat treated
    - 8.2.1.1 Cured (incl. salted)
    - 8.2.1.2 Cured (incl. salted) and dried.
    - 8.2.1.3 Fermented

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- 8.2.2 Heat-treated
- 8.2.3 Frozen
- 8.3 Processed comminuted meat, poultry and game products
  - 8.3.1 Non-heat treated
    - 8.3.1.1 Cured (incl. salted)
    - 8.3.1.2 Cured (incl. salted) and dried
    - 8.3.1.3 Fermented
  - 8.3.2 Heat-treated
  - 8.3.3 Frozen
- 8.4 Edible offal
- 8.5 Edible casings (e.g. sausage casings)

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- 9 Fish and fish products, including molluscs, crustaceans and echinoderms (MCE)**
  - 9.1** Fresh fish and fish products, incl. MCE
    - 9.1.1** Fresh fish Muscle meat of fish
      - 9.1.1.1 Muscle meat of wedge sole (*Dicoglossa cuneata*),
      - 9.1.1.2 eel (*Anguilla anguilla*)
      - 9.1.1.3 spotted seabass (*Dicentrarchus punctatus*)
      - 9.1.1.4 horse mackerel or scad (*Trachurus trachurus*)
      - 9.1.1.5 grey mullet (*Mugil labrosus labrosus*)
      - 9.1.1.6 common two-banded seabream (*Diplodus vulgaris*)
      - 9.1.1.7 grunt (*Pomadasys benneti*)
      - 9.1.1.8 european pilchard or sardine (*Sardina pilchardus*),
      - 9.1.1.9 european anchovy (*Eneraulis encrasicolus*)
      - 9.1.1.10 luvar or louvar (*Luvarus imperialis*)
      - 9.1.1.11 Anglerfish (*Lophius spp.*)
      - 9.1.1.12 atlantic catfish (*Anarhichas lupus*)
      - 9.1.1.13 bass (*Dicentratus labrax*)
      - 9.1.1.14 blue line (*Molva dipterygia*),
      - 9.1.1.15 halibut (*Hippoglossus hippoglossus*),
      - 9.1.1.16 little tuna (*Eutynnus spp.*),
      - 9.1.1.17 marlin (*Makaira*),
      - 9.1.1.18 pike (*Esox lucius*),
      - 9.1.1.19 plain bonito (*Orgynopsis unicolor*),
      - 9.1.1.20 portuguese dogfish (*Centroscymnes coelolepis*),
      - 9.1.1.21 rays (*raja spp.*),
      - 9.1.1.22 redfish (*Sebastes marinus*, *S. mentella* *S. viviparus*),
      - 9.1.1.23 sail fish (*Istiophorus platypterus*),
      - 9.1.1.24 scabbard fish (*Lepidopus caudatus*, *Aphanopus carbo*),
      - 9.1.1.25 shark (all species),
      - 9.1.1.26 snake mackerel (*Lepidocybium flavobrunneum*, *Ruvettus pretiosus*, *gempylus serpens*)
      - 9.1.1.27 sturgeon (*Acipenser spp.*),
      - 9.1.1.28 swordfish (*Xiphias gladius*)
      - 9.1.1.29 tuna (*Thunnus spp.*).
      - 9.1.1.30 Other
    - 9.1.2** Fresh bivalve molluscs
      - 9.1.2.1 Mussels
      - 9.1.2.2 Oysters
      - 9.1.2.3 Clams
      - 9.1.2.4 Other
    - 9.1.3** Fresh cephalopodes (with or without viscera)
      - 9.1.3.1 Squid
      - 9.1.3.2 Octopus
      - 9.1.3.3 Cattle-fish
      - 9.1.3.4 Other
    - 9.1.4** Fresh crustaceans,
      - 9.1.4.1 Crab (tested whole, white and brown meat, or just white meat)
      - 9.1.4.2 Lobsters (tested whole, white and brown meat, or just white meat)
      - 9.1.4.3 Shrimp
      - 9.1.4.4 Other
    - 9.1.5** Echinoderm
  - 9.2 Processed fish and fish products, incl. MCE
    - 9.2.1 Frozen fish, fish fillets and fish products, incl. MCE

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- 9.2.2 Frozen battered fish, fish fillets and fish products, incl. MCE
- 9.2.3 Frozen minced and creamed fish products, incl. MCE
- 9.2.4 Cooked and/or fried fish and fish products, incl. MCE
- 9.2.4.1 Cooked fish
- 9.2.4.2 Cooked molluscs, crustaceans and echinoderms
- 9.2.4.3 Fried fish and fish products, incl. MCE
- 9.3 Semi-preserved fish and fish products, incl. MCE
- 9.3.1 Fish and fish products, incl. MCE, marinated and/or in jelly
- 9.3.2 Fish and fish products, incl. MCE, pickled and/or in brine
- 9.3.3 Salmon substitutes, caviar and other fish roe products.
- 9.3.4 Semi-preserved fish and fish products, incl. MCE other than 9.3.1 - 9.3.3
- 9.4 Fully preserved, Canned or fermented fish and fish products incl. MCE.
- 9.4.1 Fish canned in oil
- 9.4.2 Fish canned in brine
- 9.4.3 Fermented fish

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- 10 Eggs and egg products**
- 10.1 Fresh eggs
- 10.1.1 Eggs from indoor reared hens
- 10.1.2 Eggs from outdoor reared hens
- 10.2 Egg products
- 10.2.1 Liquid egg products
- 10.2.2 Frozen egg products
- 10.2.3 Dried and/or heat coagulated egg products
- 10.3 Preserved eggs, incl. alkaline, salted, and canned eggs
- 10.4 Egg-based desserts (e.g. custard)

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- 11 Sweeteners, including honey**
- 11.1 White & semi-white sugar (sucrose or saccharose), fructose, glucose (dextrose), xylose; sugar solutions and syrups, also (partially) inverted sugars, incl. molasses, treacle, and sugar toppings.
- 11.2 Other sugars and syrups (e.g. , brown sugars, maple syrup)
- 11.3 Honey
- 11.4 Table-top sweeteners, incl. those containing high-intensity sweeteners, other than 11.1 - 11.3

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- 12 Salts, spices, soups, sauces, salads, protein products, etc.**
- 12.1 Salt
- 12.2 Herbs, spices, seasonings (incl. salt substitutes), and condiments
- 12.3 Vinegars
- 12.4 Mustards
- 12.5 Soups and broths
- 12.5.1 Ready-to-eat soups and broths, incl. canned, bottled and frozen
- 12.5.2 Mixes for soups and broths
- 12.6 Sauces and like products
- 12.6.1 Emulsified sauces (e.g. mayonnaise, salad dressing)
- 12.6.2 Non-emulsified sauces (e.g. ketchup, cheese sauce, cream sauce, brown gravy)
- 12.6.3 Mixes for sauces and gravies
- 12.7 Salads (e.g. macaroni or potato salad), sandwich spreads (excl. cocoa- and nut-based spreads)
- 12.8 Yeast
- 12.9 Protein products

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- 13 Foodstuffs intended for particular nutritional uses**
- 13.1 Infant formulae and follow-on formulae
- 13.2 Foods for young children (weaning foods)
- 13.3 Dietetic foods intended for special medical purposes
- 13.4 Dietetic formulae for slimming purposes and weight reduction
- 13.5 Dietetic foods other than 13.1-13.4
- 13.6 Food supplements

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- 14 Beverages, excluding dairy products**
- 14.1 Non-alcoholic ("soft") beverages**
- 14.1.1 Waters
  - Natural mineral waters and source waters
  - Table waters and soda waters
- 14.1.2 Fruit and vegetable juices
  - Canned or bottles (pasteurised) fruit juice
  - Canned or bottles (pasteurised) vegetable juice

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	Concentrates (liquid or solid) for fruit juice
	Concentrates (liquid or solid) for vegetable juice
14.1.3	Fruit and vegetable nectars
	Canned or bottled (pasteurised) fruit nectar
	Canned or bottles (pasteurised) vegetable nectar
	Concentrates (liquid or solids) for fruit nectar
	Concentrates (liquid or solids) for vegetable nectar
14.1.4	Water-based flavoured drinks, incl. "sport" or "electrolyte" drinks
14.1.4.1	Carbonated drinks
14.1.4.2	Non-carbonated, incl. punches and ades
14.1.4.3	Concentrates (liquid or solid) for drinks
14.1.5	Coffee, coffee substitutes, tea, herbal infusions, and other hot cereal beverages, excl cocoa.
<b>14.2</b>	<b>Alcoholic beverages, incl. alcohol-free and low-alcoholic counterparts</b>
14.2.1	Beer and malt beverages
14.2.2	Cider and perry
14.2.3	Wines
14.2.3.1	Still wine
14.2.3.2	Sparkling and semi-sparkling wines
14.2.3.3	Fortified wine and liqueur wine
14.2.3.4	Aromatized wine
14.2.4	Fruit wine
14.2.5	Mead
14.2.6	Spirituous beverages
14.3	Other alcoholic beverages (e.g. beer, wine, or spirit coolers. etc.)
<b>15</b>	<b>Ready-to-eat savouries</b>
15.1	Snacks - potato, cereal, flour or starch based (from roots & tubes, pulses & legumes)
15.2	Processed nuts, incl. coated nuts and nut mixtures (with e.g., dried fruit)
<b>16</b>	<b>Composite foods (e.g. casseroles, meat pies) -foods that can not be placed in categories 1-15.</b>

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