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Database of the Iodine Content of Food and Diets Populated with Data From Published Literature

DfID KAR Project R7411

Commissioned Report CR/03/84N

BRITISH GEOLOGICAL SURVEY

COMMISSIONED REPORT CR/03/84N

Database of the Iodine Content of Food and Diets Populated with Data from Published Literature

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Front cover

Iodised salt from a local market in China.

Key words

Iodine, food, water, diet

Bibliographical reference

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Summary

A database of results for the iodine content of foods and diets was prepared for a DFID funded project looking at "Environmental Controls in Iodine Deficiency Disorders". It was populated with citations from the literature and contains 732 records. On the basis of these data, the geometric mean result for the iodine content of foods is 87 µg/kg, from 494 citations.

Using classifications based on food type the following order for levels of iodine is determined:

Marine fish (1455.9 µg/kg) > Freshwater fish (102.8 µg/kg) > Leafy vegetables (88.8 µg/kg) > Dairy (83.9 µg/kg) > Other vegetables (80.1 µg/kg) > Meat (68.4 µg/kg) > Cereals (56.0 µg/kg) > Fresh fruit (30.6 µg/kg) > Bread (17.0 µg/kg) > Water (6.4 µg/l)

(The figure in brackets represents the geometric mean value for each group)

The results show that in general grain crops are poorer sources of iodine than vegetables and that there is some equivocal evidence to suggest that leafy vegetables contain higher iodine concentrations than other vegetables but fish and seaweed are by far the greatest natural sources of iodine in foodstuffs.

The geometric mean result for the average daily dietary intake is 161 µg/day, based on 84 citations. It is noted that vegetarian and vegan diets often do not meet the recommended adult daily intake of 150 µgI/day due to the lack of dairy, meat and fish components. Results also show that Japanese, USA and Canadian dietary intakes are higher than other countries.

Intake depends not only on the iodine content of the food but also on the composition of the diet. Results show that food accounts for over 90% of human iodine exposure in most circumstances with water and air providing minimal inputs. However, in subsistence populations drinking high-iodine groundwaters, water can contribute more than 20% of the dietary intake. Results of dietary studies show the following general order of percentage daily iodine intake from the main food groups in Western Countries:

Dairy (50%) > Cereals (20%) > Fish (9%) > Meat (8%) > Vegetables (7%) > Sweets (5%) > Fruits (1%)

The majority of iodine in Western diets comes from adventitious sources such as iodophors in the dairy industry, red food colouring and improvers in cereals, bread, meat and sweets. Removing these components to equate to a developing country diet where people are often dependant on staple grain foodstuffs such as rice shows that intakes fall below 100 µg/day. It is concluded that without adventitious sources of iodine or a marine foods component, most diets would fail to provide the recommended daily intake of 150 µg/day.

1 Introduction

This report describes a database of results for the iodine content of food and diets. These results are listed in an abbreviated format in Appendix 1. Results have been taken from published literature with a valuable source for much of the pre-1952 data being the Chilean Iodine Educational Bureau (1952) compilation of iodine in foods. The database has been compiled for use with a project investigating "Environmental Controls in Iodine Deficiency Disorders (IDD)". This project is funded by the UK Department for International Development (DFID) and aims to improve our knowledge of the geochemistry of iodine in the environment and to provide a resource for multidisciplinary teams engaged in reducing the risks of IDD.

A major problem in compiling analytical results from a wide range of sources is the lack of any consistent manner of reporting the data. Generally, fundamental information, such as the method of chemical analysis, is missing and the only data to work with are simply the iodine results. Determinations in biological samples often omit basic information such as whether the results are reported as wet or dry weight. The iodine content of different plants and animals varies between species and depends upon the part of the living organism under investigation. In the majority of cases the species and exact material analysed are not given. Despite these factors, the large number of citations included in this review is designed to give an overview of the iodine content of various foodstuffs and dietary components. The structure and fields in the database are described in the next section. Dubious or doubtful data and information were not included in the database.

The data have been interpreted to produce average results for the iodine content of foods and diets classified by a number of parameters such as country, food type, and population type (adults and children). This analysis of the database is presented in Section 3. In terms of the iodine contents of foodstuffs, geometric mean values were used in preference to arithmetic means as the data tend to be highly skewed and geomeans give a better estimation of average results. Although the process of averaging loses the significance of ranges and variability, a quantitative mean value enables a comparison between relative levels of iodine.

The histogram in Figure 1.1 shows the number of iodine intake citations in each decade with increasing amounts of information available from national dietary surveys carried out from the 1970's onwards.

The histogram in Figure 1.2 shows the number of citations for food iodine contents by each decade with peaks representing the comprehensive information presented in the Chilean Iodine Educational Bureau (1952) compilation and recent dietary survey information available in the UK (Maff, 1997), Germany (Anke et al., 1995) and India (Mahesh et al., 1992).

Johnson (1980) in a study of iodine rock analyses noted that workers in the first half of the 20th century tended to report only "higher" iodine results as the analytical methods were not capable of the sensitivity necessary to determine the low levels of iodine found in most natural materials. The very broad ranges in iodine food concentrations reported over the last century obscure comparisons between the decades for the whole dataset collated for the present study. However, removing the high values (> 8000 µg/kg or µg/l) and examining the lower ranges in the dataset, it does appear that results reported from the Chilean Iodine Educational Bureau (1952) survey in the 1950's are generally higher than values reported in more recent decades (Figure 1.3).

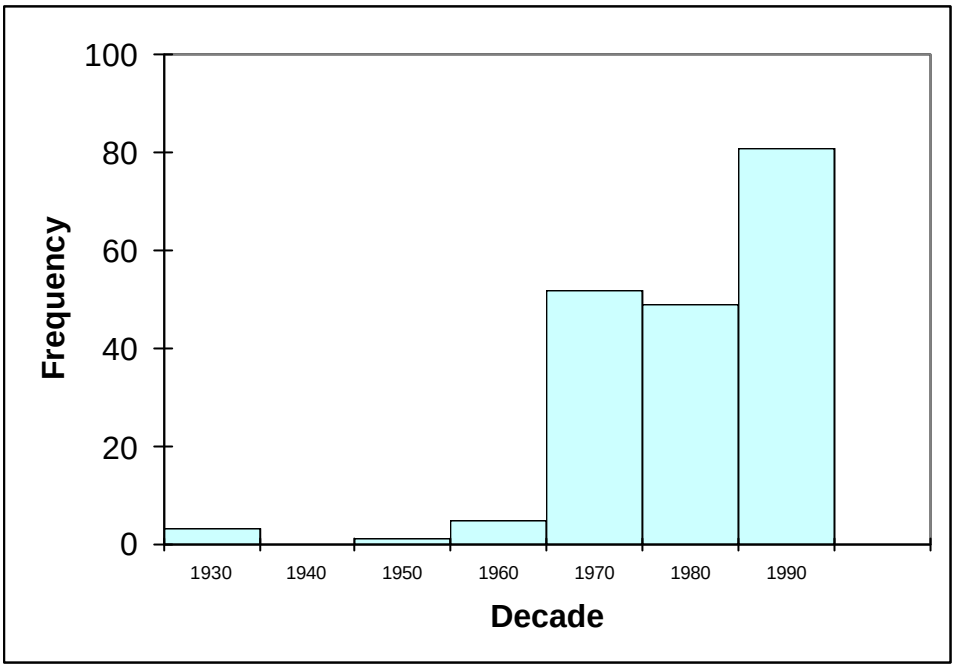


Figure 1.1: Histogram showing the frequency of citations for iodine dietary intakes classified by decade

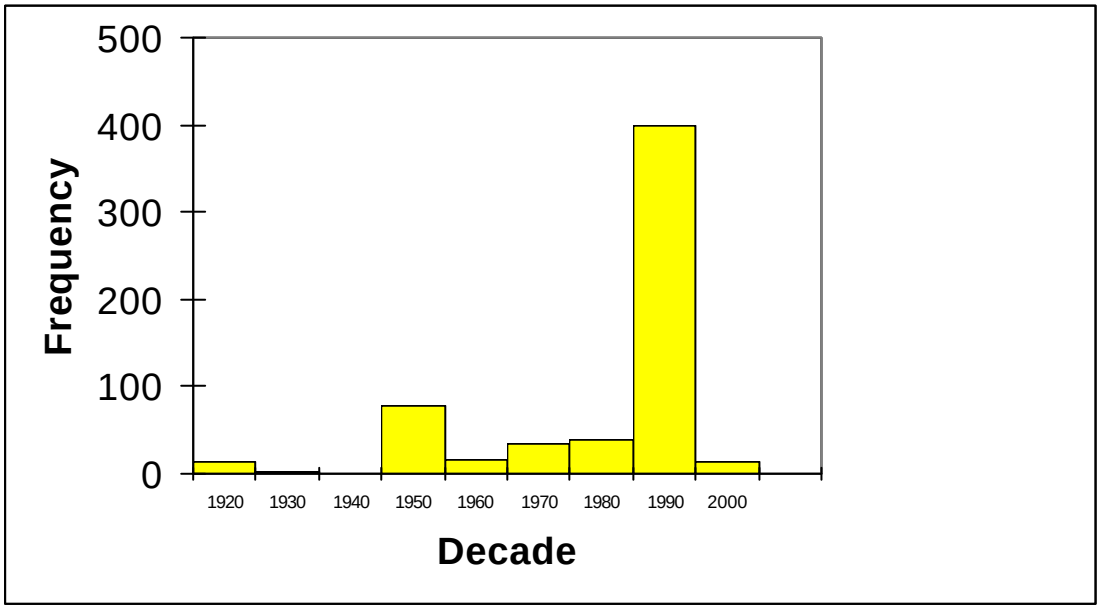


Figure 1.2: Histogram showing the frequency of citations for food iodine contents classified by decade

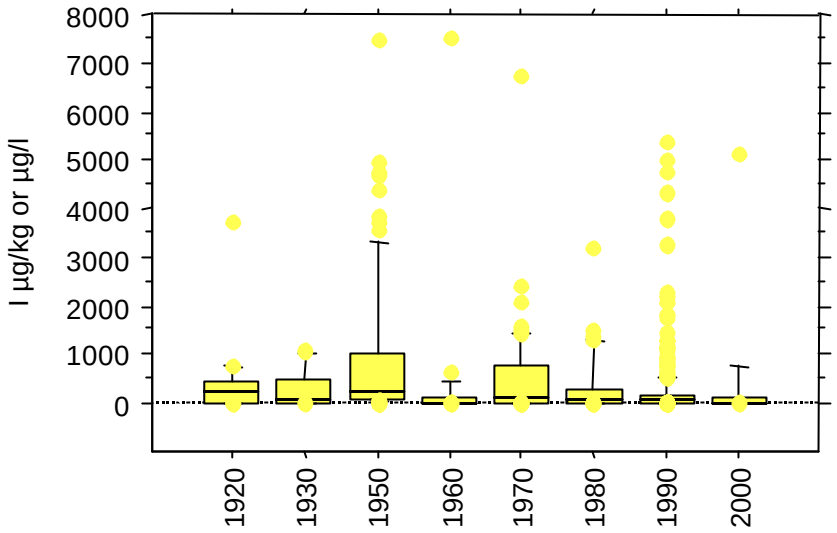


Figure 1.3: Box and whisker plot showing the levels of iodine reported in foodstuffs classified by decade for values < 8000 µg/kg (solid materials) or µg/l (liquid materials))

2 Iodine Database

2.1 DESCRIPTION

This report refers to the Microsoft Excel database **IFood.xls** last modified on 31st March 2003.

The database contains 732 records of iodine results for foodstuffs and diets. The "*Reference*" column is the key field that links the data to an Endnote® bibliographic database. Endnote® is the bibliographic software used by the project to store literature references and every entry has a unique Endnote record number. The iodine Endnote bibliography is described by (Johnson, 2003) and all cited references from the database are listed in full at the end of this report.

The data were classified into dietary and foodstuff categories depending on the facts provided in each reference (Table 2.1). Where available, information on analytical methods was noted (Table 2.2) and the iodine contents of food and diets listed (Table 2.3). The concentrations of iodine in foodstuffs and diets were recorded together and in the units given in the original references but for the purposes of data analyses, these were subsequently split into two databases one for food contents and one for dietary information and in each sub-database the data were converted to standard units of µg/kg for solid materials, µg/l for liquid materials and µg/day or % for dietary intakes. These standardised sub-sets are listed in Appendices 2 and 3. Exceptions were results reported in terms of concentrations per egg or per mineral supplement tablet, which were excluded from the summary statistical analyses but included in the discussions. Other information such as the country in which the study took place, the date of the study and when the information was entered into the database were also included (Table 2.4).

Table 2.1 Table showing examples of diet and foodstuff classifications in the Iodine in foods database

Classification	Sub-Classification	Item	Alternate name
Foodstuff	Water	Drinking water	Surface water
Foodstuff	Vegetable	Red chillies	*Capsicum annucem*
Foodstuff	Meat	Bacon	
Diet	Vegetable	Cabbage	Dietary Contribution
Diet	Recommended Daily Intake	Adults	
Diet	Average Daily Intake	7 – 10 years	
Medicine	Amiodarone	Amiodarone	

Table 2.2 Table showing examples of analytical information in the iodine in foods database

Item	State	Method of extraction	Method of determination
Rice	Dry Weight	Dry ashed with KOH and ZnSO4	Ceric Ce and As, spectrophotometry
Apple	Dry Weight		Sandell-Kolthoff Procedure
Canned Vegetables	Fresh Weight	Tetramethyl Ammonium Hydroxide	ICP-MS
Barley	Dry Weight	Dissolution in 1/10 w/v distilled water	Autoanalyser Technicon I
Drinking Water		x50 conc of 100 ml by lyophilization	Autoanalyser Technicon I
Wheat	?	Catalytic reduction by ceric arsenite salt	Barkers modified incineration
Rice	?		Automated NaI scintillation counter
Bread	Dry Weight	Dry ashed with K2CO3 and ZnSO4	Colorimetrically, iron thiocyanate destruction by nitrate in iodide
Cooking salt	?		Potentiometric Method
Cabbage	Fresh Weight	Dry powder digested with NaOH+ZnSO4	Modified Barker's As and Ce technique photometric determination
Drinking Water			Orion Electrode method
Drinking Water			Automated photometry
Rock Salt	Dry Weight	Digested with NaNO2+H2SO4	Hydride generation ICP-AES
Diet			Standardised market basket tests
			Rate of excretion versus intake
			Dietary surveys

Table 2.3 Table showing examples of the information collated on the range of iodine contents in foods and diets in the database

Item	Units	Min	Max	Average	Geometric mean	Number	Comments
Milk	µg/100ml	Minimum iodine value quoted	Maximum iodine value quoted	Average iodine value quoted	Geometric mean iodine value if quoted	Number of samples analysed	All units subsequently standardised to µg/kg (solid); µg/l (liquid) and µg/day or % for dietary intake prior to data analysis
Wheat	µg/100g						
Cabbage	µg/kg						
Water	µg/l						
Dietary Intake	µg/day						
Dietary Intake	mg/day						
Dietary contribution	%						

Table 2.4 Table showing examples of the background information included in the foods and diets database

Item	Reference	Citation	Year	Country	Record input by	Date	Notes
Wheat	Reference to the literature from where the food result was taken. This is the record number in the EndNote Bibliography. The references cited in the food database are listed in full at the end of this report	Indicator of primary or secondary citation. The latter means that the data were cited in the reference to another source	The year in the reference for which the data are cited	Country of sample site	Initials of the person who input the record (FMF = Fiona Fordyce, CCJ = Chris Johnson)	Date of data input	Additional information not entered elsewhere

3 Analysis of the Database

3.1 IODINE CONTENT OF FOODS OVERVIEW

In the foodstuffs sub-set database, 494 of the citations report 'average' iodine contents whereas 142 provide the range of concentrations established. The majority of values quoted are summaries from a large number of foodstuff results so the actual number of determinations is far greater than the number of citations. In order to maximise the information available for each food type, both the average and ranges of data were considered in this report. All data in the database are assumed to be total iodine results.

3.1.1 Average Iodine Concentrations in Foodstuffs

A histogram of the 494 results for average iodine contents in foodstuffs is given in Figure 3.1. This shows a large positive skew with over half the data falling within the first bin interval of 0 – 100 µg/kg. Summary statistics for all the average data are given in Table 3.1. As the data are skewed, the geometric mean of 87 µg/kg or µg/l is a better estimate of the average iodine content of foodstuffs.

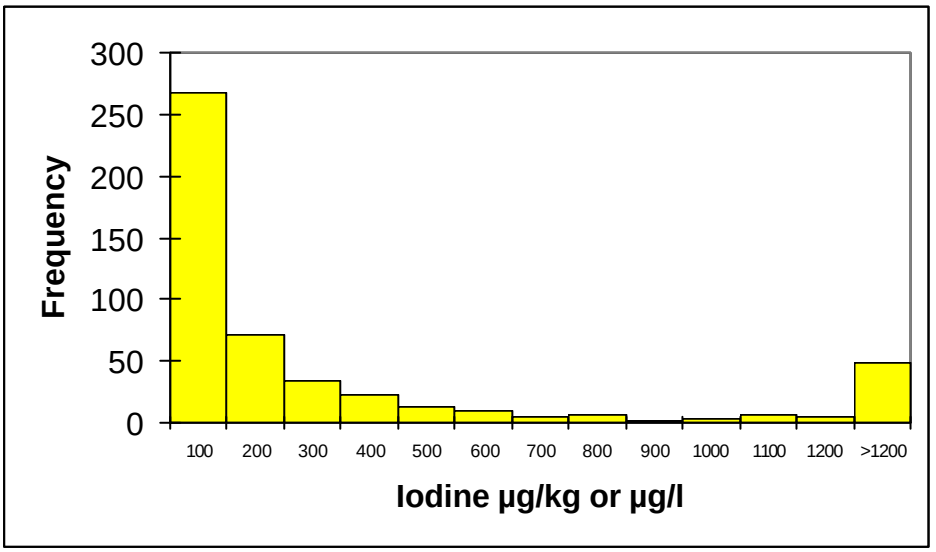


Figure 3.1 Histogram showing the distribution of reported average iodine concentrations in foodstuffs

Table 3.1 Summary statistics for the average iodine content of foodstuffs from results in the database.

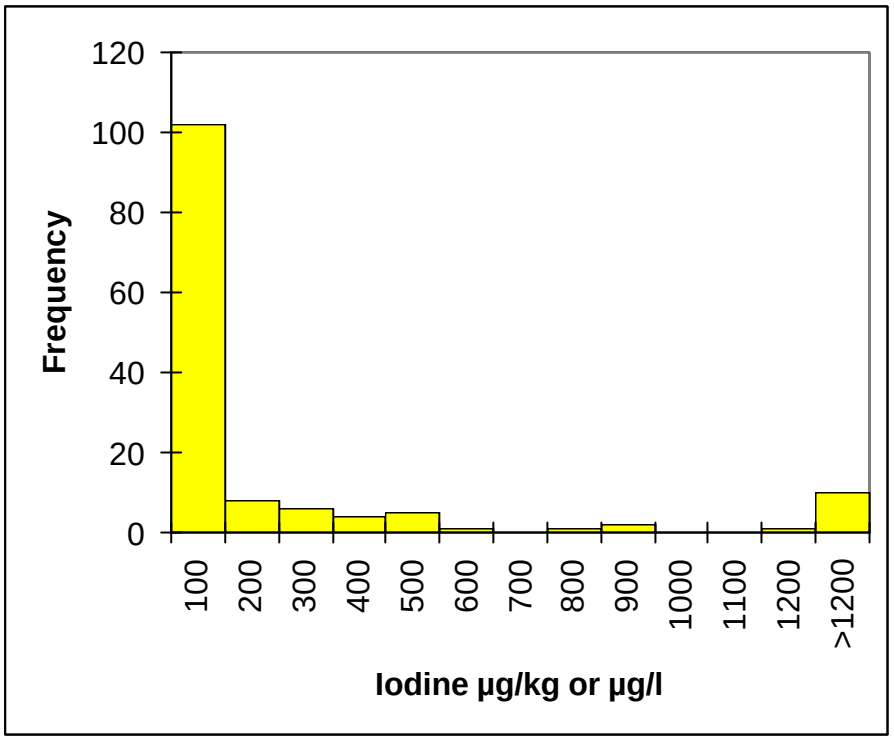
	Average iodine content of foodstuffs (µg/kg or µg/l)
Mean	**1422**
Median	**90**
Geomean	**87**
Number	**494**
Minimum	**0**
Maximum	**113000**

3.1.2 Ranges of Iodine Concentrations in Foodstuffs

Histograms of the 139 minimum and 142 maximum results for iodine contents in foodstuffs are given in Figure 3.2. In both cases, the data are positively skewed although a large proportion of the maximum data fall in the top bin interval (> 1200 µg/kg or µg/l). Summary statistics for the range data as a whole are given in Table 3.2 and show that values vary from a minimum of 0 to a maximum of 4500000 µg/kg.

Table 3.2 Summary statistics for the minimum and maximum iodine content of foodstuffs from results in the database.

	Iodine content of foodstuffs (µg/kg or µg/l)	
	Minimum	**Maximum**
Mean	**2033**	**53947**
Median	**30**	**235**
Geomean	**29**	**256**
Number	**139**	**142**
Minimum	**0**	**1**
Maximum	**10000**	**4500000**



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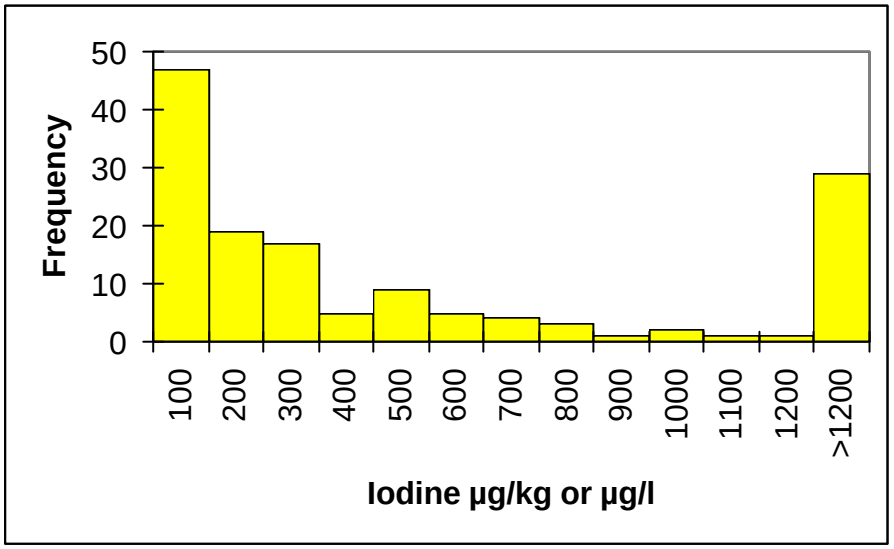


b

Figure 3.2 Histograms showing the distribution of reported minimum (a) and maximum (b) iodine concentrations in foodstuffs

3.2 IODINE CONTENT OF FOODSTUFFS CLASSIFIED BY FOOD TYPE

In the main database, the exact type of food reported in the citations was recorded (Appendix 1). For the purposes of preparing summary statistics the results were grouped according to main foodstuffs, for example all different types of cheese (Gouda, Camembert etc) were included under 'Cheese'. Summary statistics for the different food types listed in geometric mean iodine concentration rank are given in Table 3.3. Minimum and maximum results reflect the broadest ranges in the data reported whereas the averages (mean, median, etc.) were calculated from all average results reported for each food type the number of which was noted. These data should be treated with caution due to the small sample size for some food types (< 10 samples). The data are further summarised into generic food groups in Figure 3.3 and Table 3.4.

As expected iodised products such as mineral tablets, salt and bread contain an order of magnitude higher average contents than most other foodstuffs (Figure 3.3). Concentrations in other salt products including cooking salt are also high but these values could include salt that was iodised but not reported as such in some studies.

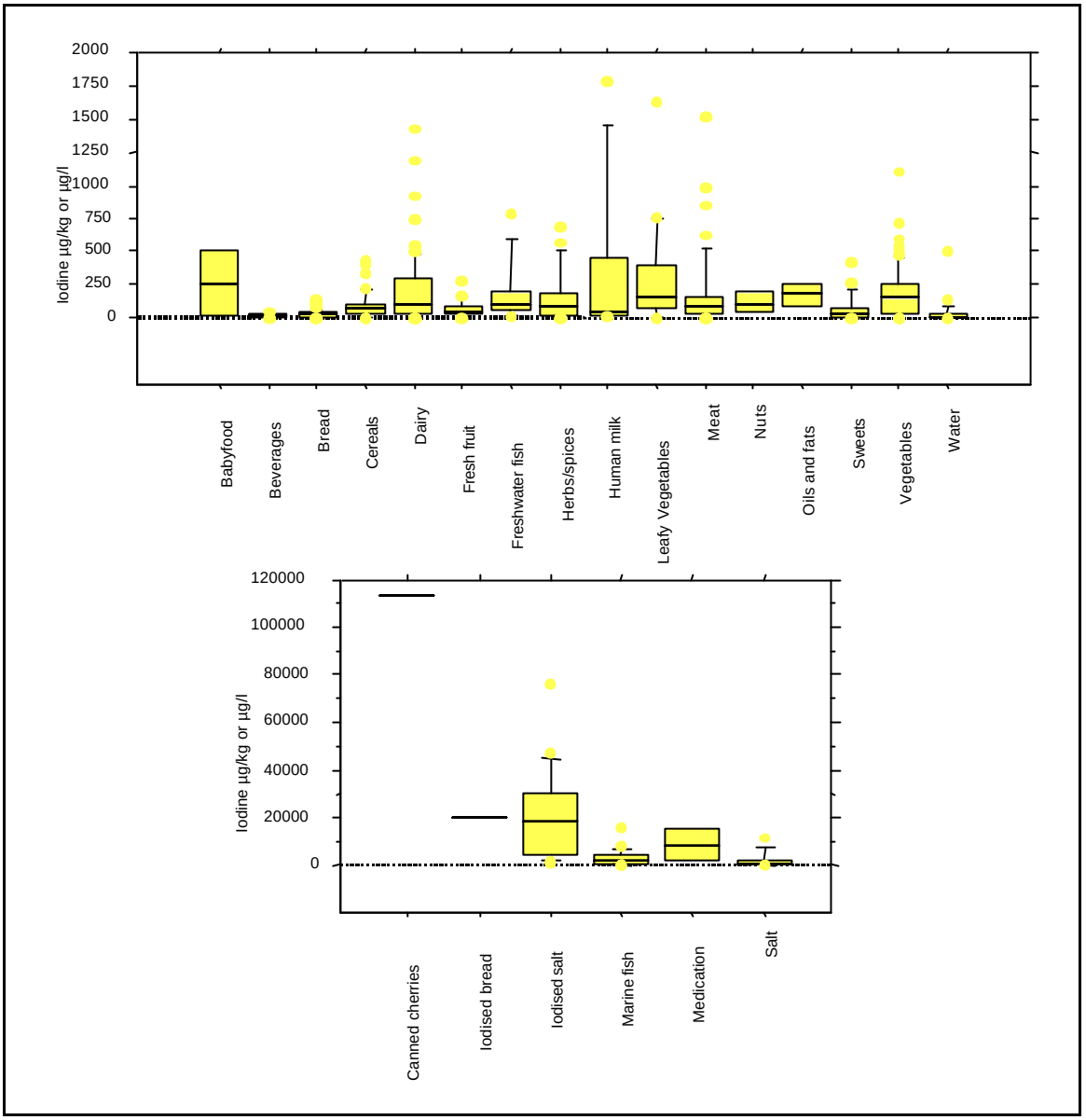
Of the natural food products, highest iodine contents are reported in seaweed, up to 4500000 µg/kg, fish oils and marine fish (geometric means 4066.4 and 1294.6 µg/kg respectively), which contain 10 times (namely 0.45 %) the amount in freshwater fish (geometric mean 102.8 µg/kg) and are an excellent dietary source of iodine (Table 3.3).

The results also highlight the importance of food processing as this can provide sources of "adventitious" iodine in the diet. This is iodine added to food but not for the purpose of supplementation, which Dunn (1996) describes as the "silent prophylaxis". Koutras (1980) outlines the following adventitious sources of iodine:

- iodine content of poultry and eggs increased by the use of fish flour as chicken food
- iodoform used in water as a disinfectant
- iodates used as oxidants and sanitising agent in the bread making process
- use of iodophors as antiseptic cleansing agent in the dairy industry
- iodine-rich red food colouring erythrosine (2,4,5,7-tetraiodofluorescein) (e.g. in red glazed cherries)

The two key aspects in this respect are the use of iodophors as antiseptic cleansing agent in the dairy industry and iodine-containing red food colouring (erythrosine) in meat and other products. Although milk is naturally enriched in iodine (see the data in Chilean Iodine Educational Bureau, 1952) the use of iodophors has significantly increased the iodine levels to such an extent that there has been concern about the toxic effects.

The use of red food colouring probably accounts for the very high iodine concentration reported in canned cherries (113000 µg/kg) and the broad range in average meat iodine values (0 – 1500 µg/kg) recorded during the present review (Figure 3.3). Average iodine concentrations in dairy products vary widely (0 – 1500 µg/kg or µg/l) (Figure 3.3), however, cows milk specifically ranks only 18th out of 44 food types in terms of geometric mean iodine concentrations (Table 3.3) whereas eggs rank 10th which may indicate the widespread use of fish meal and seaweed as chicken feed. Cows milk has a higher geometric mean concentration (95.0 µg/l) than cheese (33.1 µg/kg) or butter (32.0 µg/kg) which ranks 34th out of 44 in Table 3.3, but iodine concentrations in butter are higher than those reported in margarine (average 0.7 – 9.4 µg/kg) (Appendix 2).



For numbers of citations in each group see Tables 3.3 and 3.4

Figure 3.3 Box and whisker plots of the 10th 25th, 50th, 75th, 90th and 95th percentiles of average values reported in various food groups.

Baby-food and infant formula have relatively high average iodine concentrations probably reflecting the dairy component of many of these products (Figure 3.3). Human milk shows a very broad range in average concentrations (0 – 1750 µg/l) (Figure 3.3) and ranks 19th out of 44 food types in terms of geometric mean values (Table 3.3) containing similar iodine contents to dairy milk products.

The overall aim of the present project is to examine environmental controls on iodine deficiency disorders and as such, the project has focussed on the transfer of iodine from soils into food crops as outlined in Johnson et al. (2003). In summary, volatilisation of iodine from soils as gaseous forms is thought to be a very important part of the iodine cycle. Plant roots and micro organisms are thought to produce gaseous iodine, which is emitted from the plant shoot to the atmosphere where it is absorbed onto plant leaves.

Muramatsu et al. (1985) demonstrated that the transfer ratio (concentration in the plant over the concentration in the soil in which it was grown) varied widely between vegetation species with low values for tomato (0.003) and rice (0.0019) and the highest for broccoli (*Brassica rapa L.)* (0.016). They also noted the following order for the concentration of iodine in plants:

older leaves > younger leaves > fruit/grain/beans

indicating little translocation from leaves where the iodine is adsorbed to the other plant organs. A similar lack of translocation from the leaves is reported by Sheppard et al. (1993). Asperer and Lansangan (1986) working in the Philippines noted that leafy vegetables took up more iodine than root vegetables and other studies indicate that iodine concentrations are higher in the leaves than the seeds of plants (Anke et al., 1993) (Beeson and Matrone, 1972), therefore it is anticipated that results from the iodine in foodstuffs database should demonstrate that leafy vegetables contain higher iodine concentrations than other vegetables and cereal crops.

The results show that all cereals (wheat, barley, oats and rice), bread and flour products have very low iodine concentrations as expected and these basic foodstuffs are likely to be poor sources of dietary intake (Figure 3.3 and Table 3.3). The exception is maize, which has a similar geometric mean iodine concentration (92.6 µg/kg) to cows milk (Table 3.3).

Vegetables have higher concentrations than cereal crops, however, there is a broad overlap in the range of average values reported for leafy vegetables (0.4 – 1636 µg/kg) and other vegetables (0.2 – 1102 µg/kg) (Figure 3.3). Some leafy vegetables such as spinach and lettuce have quite high geometric mean iodine concentrations ranking 7th and 12th out of 44 food types respectively (Table 3.3) whereas other leafy vegetables such as cabbage rank much lower (31st). Interestingly root vegetables such as turnip and beetroot also rank quite highly (8th and 11th) but some of these results are for the whole plant including the leaves. Beans, peas and pulses (legumes) are not noticeably higher in iodine than other vegetable types whereas tomatoes contain low iodine concentrations (geometric mean 25.3µg/kg) commensurate with the poor transfer ratio of iodine from soils to plants indicated above. In general, the geometric mean iodine content of leafy vegetables (88.8 µg/kg) is slightly higher than other vegetables (80.1 µg/kg) (Table 3.4) therefore, on this basis, there is some evidence that the iodine content of leafy vegetables is greater than other vegetables but the results are equivocal.

Average iodine concentrations in herbs and spices and in nuts show a similar range to vegetables (Figure 3.3) whereas fruits and sweets are low in iodine (Figure 3.3 and Table 3.3).

In general drinking water contains very low iodine concentrations (geometric mean 6.4 µg/l, Table 3.3) and in most developed countries water will not form an important dietary source of iodine. However, in undeveloped subsistence level economies, the present study has shown that drinking water can contribute significant quantities to the diet (see Johnson et al., 2003).

In summary the results of the review show the following order of geometric mean iodine content for the main food groups (Table 3.4):

Marine fish (1455.9 µg/kg) > Freshwater fish (102.8 µg/kg) > Leafy vegetables (88.8 µg/kg) > Dairy (83.9 µg/kg) > Other vegetables (80.1 µg/kg) > Meat (68.4 µg/kg) > Cereals (56.0 µg/kg) > Fresh fruit (30.6 µg/kg) > Bread (17.0 µg/kg) > Water (6.4 µg/l)

Table 3.3 Summary statistics for data grouped by food type, ordered by geometric mean iodine concentration.

Food Type	Rank	Iodine Content (µg/kg)					
		Number	Mean	Geo-mean	Median	Minimum	Maximum
All data		494	1422.0	87.0	90.0	0.0	4500000.0
Iodised bread		1	20000.0				
Iodised salt		18	21041.1	11330.2	18240.0	140.0	76000.0
Medication/supplements I µg/tablet		2	8400.0	5196.2	8400.0	100.0	15000.0
Water purification tablet µg/l		1	8000.0				
Seaweed	1					400.0	4500000.0
Canned Cherries	2	1	113000.0				
Fish oil	3	4	4562.3	4066.4	3706.0	2450.0	8387.0
Marine Fish	4	35	2453.4	1294.6	1280.0	64.0	15941.0
Salt	5	9	1787.5	591.9	495.0	83.0	11200.0
Asparagus	6	1	1102.0			285.0	3780.0
Spinach/cauliflower	7	3	660.7	356.2	221.0	19.0	48650.0
Turnip	8	3	333.0	321.1	343.0	111.0	2000.0
Dairy (unspecified)	9	5	282.2	253.0	340.0	151.0	420.0
Eggs	10	10	378.8	225.6	386.0	4.4	4767.0
Beetroot	11	5	234.2	223.8	196.0	8.0	1435.0
Lettuce	12	5	455.5	165.7	610.0	1.7	6740.0
Peppers/chillies	13	5	201.4	102.9	141.0	0.8	400.0
Freshwater Fish	14	10	189.3	102.8	101.5	117.0	790.0
Vegetables (unspecified)	15	17	202.1	102.1	71.0	10.0	600.0
Carrot/onion	16	3	143.7	101.0	202.0	2.0	2400.0
Nuts	17	4	126.5	99.7	108.0	40.0	250.0
Cows milk	18	33	194.8	95.0	110.0	6.0	4000.0
Human milk	19	9	361.8	93.9	40.0	10.0	5400.0
Maize	20	5	122.0	92.6	80.0	43.0	330.0
Baby-food/formula	21	2	258.5	92.2	258.5	6.3	500.0
Oils and fats	22	6	114.0	87.0	36.4	0.7	280.0
Cereals (unspecified)	23	16	107.7	86.1	87.0	14.0	347.0
Beans/peas/pulses	24	23	186.7	75.6	176.0	0.3	1500.0
Goats milk	25	6	263.9	71.9	72.5	5.1	1181.0
Meat/meat products	26	38	182.9	68.4	90.0	1.6	45500.0
Herbs and spices	27	25	160.1	61.7	87.0	2.0	678.0
Rice	28	8	143.2	54.3	71.5	1.8	438.0
Wheat	29	9	74.4	46.7	44.0	0.0	389.0
Potatoes	30	13	102.6	45.5	74.0	0.5	480.0
Cabbage	31	9	123.1	39.5	90.0	0.4	95000.0
Cheese	32	11	77.1	33.1	66.0	3.6	164.0
Cucumber	33	4	194.8	32.8	189.5	0.2	940.0
Butter	34	4	30.3	32.0	16.5	1.3	56.0
Fresh Fruit	35	19	71.6	30.6	53.0	0.2	277.0
Barley	36	5	48.9	29.4	42.0	3.7	92.0
Tomatoes	37	5	65.1	25.3	31.0	5.0	660.0
Oats	38	5	47.8	25.2	39.0	3.4	764.0
Sweets/puddings	39	22	70.1	23.3	36.5	1.4	410.0
Processed vegetables	40	6	28.75	22.5	34.5	35.0	260.0
Bread	41	18	35.4	18.3	30.5	14.0	140.0
Beverages	42	6	19.2	16.0	21.5	0.0	40.0
Flour products	43	15	29.3	15.6	36.0	1.3	78.0
Drinking water µg/l	44	25	39.7	6.4	3.1	0.0	1300.0

Number = number of average results used to calculate mean, median and geomean results * Value for the whole plant including leaves
Where no geometric mean calculation is available, data are ordered on the mean iodine content

Table 3.4 Average iodine contents of the main food groups listed by geometric mean concentration.

Food Type	Iodine Content (µg/kg)			
	Number	Mean	Geo-mean	Median
Marine fish	39	2669.7	1455.9	1300.0
Salt	9	1787.5	591.9	495.0
Freshwater fish	10	189.3	102.8	101.5
Nuts	4	126.5	99.7	108.0
Human milk µg/l	9	361.8	93.9	40.0
Leafy vegetables	17	315.7	88.8	171.0
Dairy µg/l/ or µg/kg	70	202.8	83.9	116.0
Other vegetables	79	188.3	80.1	148.0
Meat	38	182.9	68.4	90.0
Herbs/spices	25	160.1	61.7	87.0
Cereals	48	96.5	56.3	76.5
Oils and fats	6	114.0	36.4	87.0
Fresh fruit	19	71.6	30.6	53.0
Sweets	22	70.1	23.3	36.5
Bread	33	32.6	17.0	31.0
Water µg/l	25	39.7	6.4	3.1

Number = number of average results used to calculate mean, median and geomean results

3.3 DIETARY IODINE CONTENTS OVERVIEW

3.3.1 Recommended Daily Intakes

In the dietary sub-set of the database, 14 citations give information on recommended daily intakes of iodine which range from 50 µg/day in children and infants to 200 µg/day in adults, this upper range normally refers to pregnant and lactating women whereas 80 - 150 µg/day is recommended for other adults (WHO, 1996). The values are consistent through time and between countries (Table 3.6). A maximum tolerable threshold of 1000 µg/day or 17 µg/kg bodyweight/day is suggested by studies carried out in the UK (Table 3.5) although WHO (1996) report that thyrotoxicosis can occur with intakes as low as 200 µg/day in populations previously suffering deficiency.

Table 3.5 Summary of information relating to recommended iodine dietary thresholds from the database

Threshold	Type	Reference	Year	Units	Lower	Upper	Country	Method
Rec Minimum Daily Intake	Child	813	1970	µg/day	55	135	Tasmania	
Rec Minimum Daily Intake	Child	775	1991	µg/day	50		UK	Dietary Surveys
Rec Minimum Daily Intake	Adult	657	1935	µg/day	44	162	World	From results of balance studies
Rec Minimum Daily Intake	Adult	657	1937	µg/day	100	200	World	Based on losses in urine
Rec Minimum Daily Intake	Adult	657	1938	µg/day	100	200	World	From many studies
Rec Minimum Daily Intake	Adult	657	1964	µg/day	160	200	World	Dietary Surveys
Rec Minimum Daily Intake	Adult	612	1969	µg/day	100	200	UK	
Rec Minimum Daily Intake	Adult	813	1970	µg/day	90	150	Tasmania	
Rec Minimum Daily Intake	Adult	775	1991	µg/day	70	140	UK	Dietary Surveys
Rec Minimum Daily Intake	Adult	834	1993	µg/day	50		World	
Rec Minimum Daily Intake	Adult	838	1993	µg/day		160	Canada	
Rec Minimum Daily Intake	Adult	313	1995	µg/day	50	80	Germany	
Rec Minimum Daily Intake	Adult	1083	1996	µg/day	80	150	World	Dietary Surveys
Rec Minimum Daily Intake	Adult	1086	1997	µg/day	100	140	UK	Dietary Surveys
Upper Safe Limit	Adult	775	1991	µg/day		1000	UK	Dietary Surveys
Maximum Tolerable Daily Intake	Adult	1086	1997	µg/kg bw/day		17	UK	Dietary Surveys

Rec = Recommended bw = body weight Reference = citation identifier in the bibliographic database

3.3.2 Average Daily Intakes

The dietary sub-set of the database contains 84 references to average daily iodine intakes in adults and children from various countries around the world (Appendix 2). Of these, 71 report 'average' results and 16 give minimum and maximum ranges in daily dietary intake. The majority of these results are based on extensive dietary or market basket surveys therefore represent a much larger dataset. The 'average' intakes reported range from 15 – 1770 µg/day and these data were used to calculate overall dietary averages (mean, median and geometric mean results) for a number of different population types (Table 3.6 and Figure 3.4). Although these results should be treated with caution due to the small sample sizes for some of the population classes, the geometric mean of all the average iodine intakes is calculated as 161 µg/day.

Both Remer et al. (1999) and Draper et al. (1993) from studies in Germany and the UK respectively note that due to the lack of meat, fish or dairy contents vegetarian and vegan diets provide limited iodine and in the case of the UK do not meet recommended daily intakes.

There is some evidence that average daily dietary iodine intakes have been falling through time, although data are limited before the 1970's (Table 3.6), Figure 3.4 shows that between 1970 and the 1990's average values fell from approximately 260 to 120 µg/day.

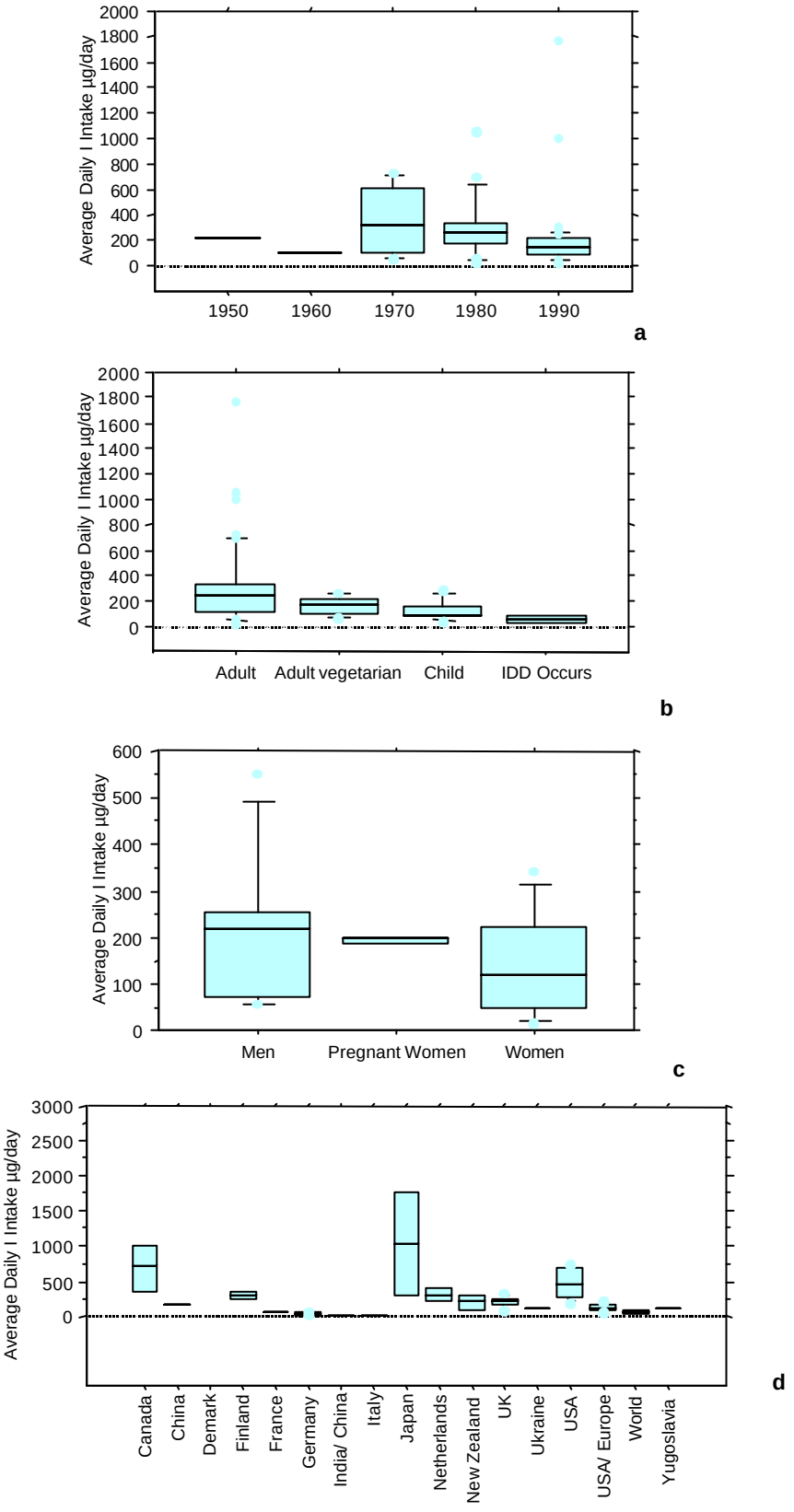
Figure 3.4 shows the ranges in average daily iodine intakes by country. With the exception of the Germany, USA, USA/Europe and UK classes, the number of citations are limited (Table 3.6) therefore the results should be treated with caution. None the less, it is evident that average dietary intakes reported in Japan, USA and Canada are higher than in most other countries.

Minimum and maximum dietary intake data range from 35 µg/day from a study in Germany (Delange, 1994) to 20 000 µg/day from Japan (Nagataki, 1993) (Table 3.6). Although Japanese diets are often quoted as being high in iodine, Nagataki (1993) report a very broad range from this maximum to a minimum of 100 µg/day and point out that not all diets in Japan are rich in iodine, only those that incorporate seaweed and a high fish content.

Table 3.6 Summary of the ranges and averages of daily iodine intake contained in the dietary database

	Iodine Intake µg/day							
	Number	**Mean**	**Geo-mean**	**Median**	**Minimum**	**Maximum**		
Ranges of Daily Intake								
All data	16				35	20000		
Averages of Daily Intake								
All data	71	248	161	175	15	1770		
Adult	47	312	200	243	15	1770		
Pregnant Women	4	194	193	200	175	200		
Men	7	211	158	216	57	550		
Adult vegetarian	6	162	147	170	66	253		
Child	15	124	108	90	40	280		
Women	12	141	95	116	15	340		
IDD occurs	3	57	46	50	20	100		
Averages of Daily Intake	**Number of Citations**							
	1	2	4	6	10	16	19	41
Country	China	Finland	Canada	Germany	USA	USA/Europe	UK	
	China/India	Japan						
	France	Netherlands						
	Italy	New Zealand						
	Ukraine	World						
	Yugoslavia							
Decade	1950				1970		1980	1990
	1960							

Number = number of average results used to calculate mean, median and geomean results

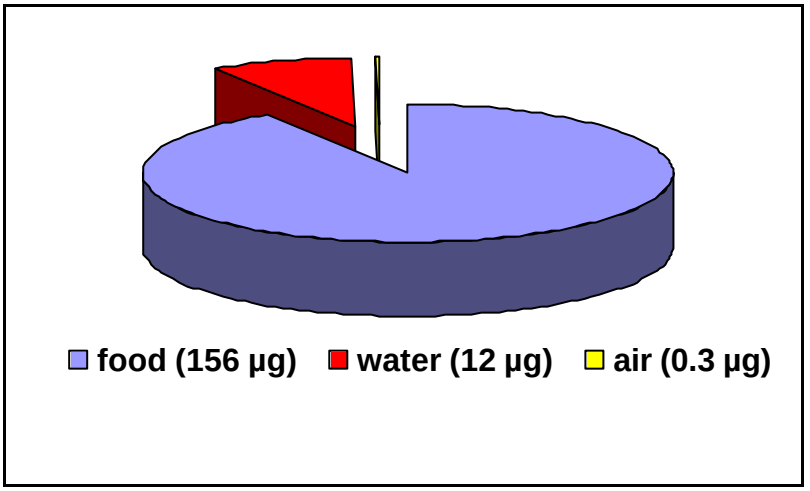


For numbers of citations in each group see Table 3.6

Figure 3.4 Box and whisker plots of the 10th 25th, 50th, 75th, 90th and 95th percentiles of reported average daily iodine intakes classified by (a) decade, (b) population type (c) gender and (d) country.

3.4 DIETARY IODINE CONTRIBUTIONS FROM VARIOUS FOODSTUFFS

According to the UK Food Standards Agency (Food Standards Agency, 2000), the relative contributions of food, air and water to the average daily iodine intake (for a developed country) are illustrated in Figure 3.5. This comprises 156 µg iodine per day from food; 12 µg iodine from drinking water (based on drinking 1.5 - 2 litres per day containing 5 - 10 µg/l) and 0.3 µg iodine from air (based on an air intake of 20 m^3 per day (Vought et al., 1970) and average atmosphere iodine content of 10 -20 ng/m^3 (Whitehead, 1984). This shows the relative contribution of each source and, in particular, the minimal contribution from the air. As outlined above, drinking water will, in industrialised and developed countries, represent between 5 - 10% if the daily iodine intake.

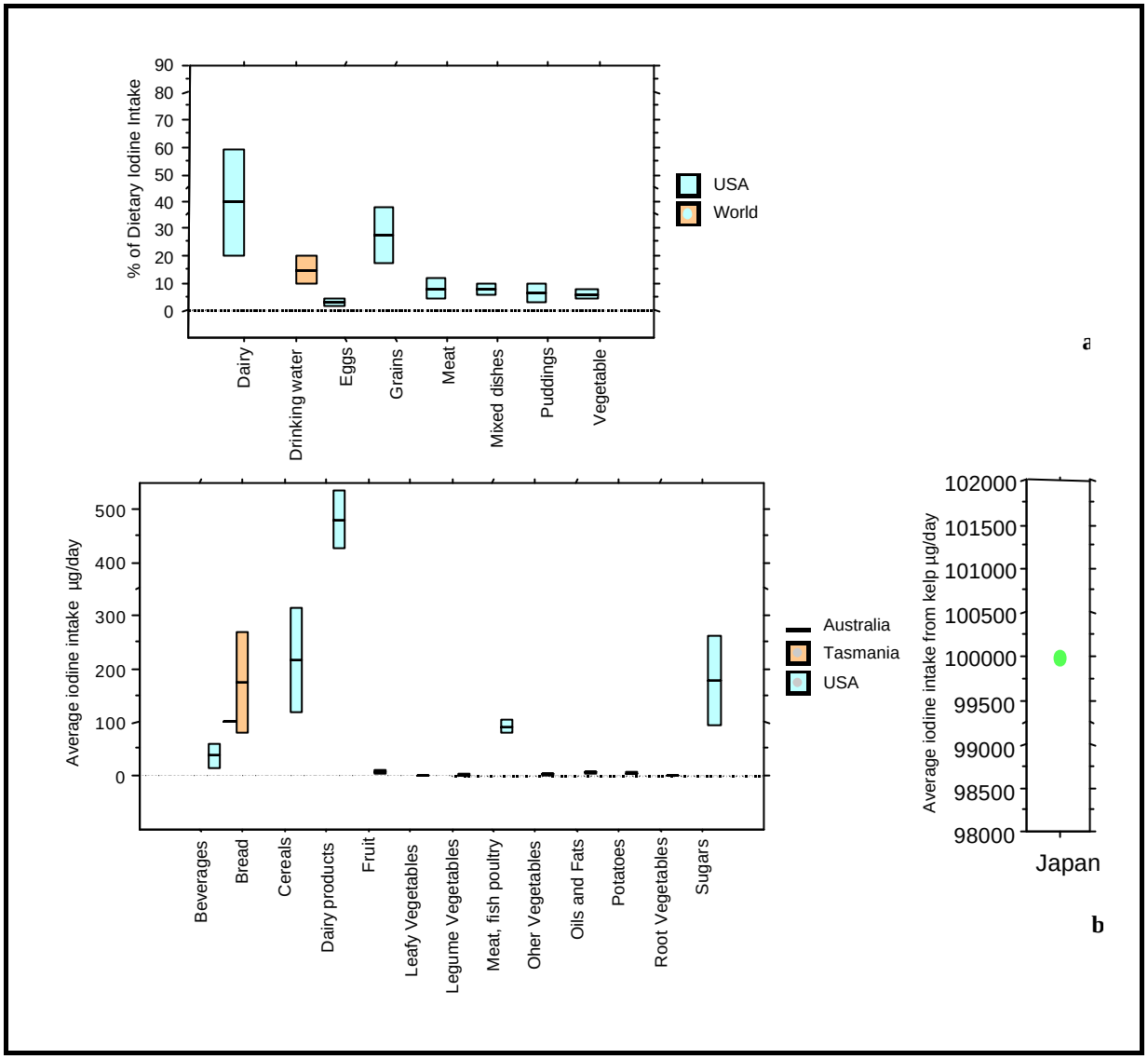


Based on information from the (Food Standards Agency, 2000)

Figure 3.5 Pie chart showing the contribution to daily iodine intake from food, water and air for a typical diet in a developed country

In terms of intake, in addition to the iodine content, the proportion of each type of food consumed also determines the dietary exposure. Of the 70 dietary contribution citations in the database, 49 report average daily intakes from various food types whereas 22 give minimum and maximum ranges in intake (Appendix 3). The minimum and maximum range data comprise 9 percentages of total daily iodine intakes and the remainder give values in terms of µg/day. It is not possible to use these data to determine overall proportions of dietary intake as they give a range of values rather than an average for each food type. Therefore, these data are summarized in box and whisker format in Figure 3.6. Two of the citations for average intakes from foodstuffs also report values for specific food types without reference to the rest of the diet (kelp 100 000 µg/day and bread 100 µg/day) thus cannot be used in the context of total dietary contributions and are also summarized in Figure 3.6. These data show that dairy products and cereals provide the largest dietary iodine contribution in the USA and the significant contribution from sugars probably reflect the use of red food colouring in sweet products (Figure 3.6). The dietary contributions from bread reported from Tasmania refer to a programme of adding potassium iodate as a bread improver, which proved more successful than iodine tablets in reducing goitre prevalence in children (Clements et al., 1970). Although Fuge (1989) estimates that 10 – 20% of dietary intake is from iodine in water he suggests that in most cases the

contribution is much less than 10% (Figure 3.6). Iodine intakes from kelp reported in Japan, are 1000 times greater than those of most other foodstuffs (Figure 3.6).



USA (a) n = 2 and Japan (Dunn, 1993) USA (b) n = 2 (Park et al., 1981) World n = 2 (Fuge, 1989) Australia (Eastman, 1993) Tasmania (Clements et al., 1970)

Figure 3.6 Box and whisker plots of the 10th 25th, 50th, 75th, 90th and 95th percentiles of (a) the percentage and (b) the amount of daily iodine intake from various foodstuffs

Four surveys from the UK provide information on total diet average iodine intakes from various food groups and these are outlined in Table 3.7 and summarised in the pie charts in Figures 3.7 – 3.10. Results show that for all food groups except vegetables iodine intakes are lower in the 1997-1998 survey compared to the previous estimates. The reduction in intake from meat and sweets may be due to relatively recent restrictions on the use of red food colouring in these products (Food Standards Agency, 2000).

In general the proportion of iodine intake in various food groups from the American and UK studies can be summarised as follows for a Western diet:

Dairy (50%) > Cereals (20%) > Fish (9%) > Meat (8%) > Vegetables (7%) > Sweets (5%) > Fruits (1%)

It is interesting that the majority of iodine in Western diets comes from adventitious sources such as iodophors in the dairy industry, red food colouring and improvers in cereals and bread and colouring in meat and sweets. In many developing countries, populations depend upon predominantly grain based diets (e.g. rice) which, as demonstrated above, are the least enriched parts of the plant, hence will provide much less iodine. For example, Mahesh et al. (1990) estimate that 75% of the dietary iodine is expected from cereals in regions of India. If the dairy produce, meat and fish are removed from the Western diets shown in Figures 3.6 – 3.10, the composition becomes comparable to that from the developing world and iodine intake amounts to less than 100 µg/day. Indeed, it is the conclusion of this study that locally grown foodstuffs from most areas of the world, except those in iodine enriched environments (e.g. coastal areas) are unlikely to produce sufficient iodine to reach an adult's Recommended Dietary Allowance (RDA) of 150 µg/day and this can only be achieved via the inclusion of iodine-rich seafood and/or adventitious sources of iodine introduced during food processing.

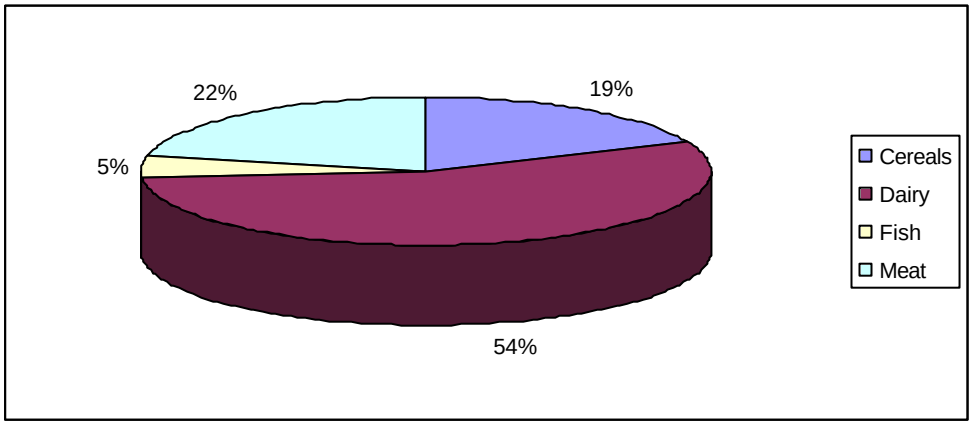


Figure 3.7 Pie chart showing the percentage contribution of various foodstuffs to daily dietary iodine intake in the UK for 1982 (from Wenlock et al., 1982)

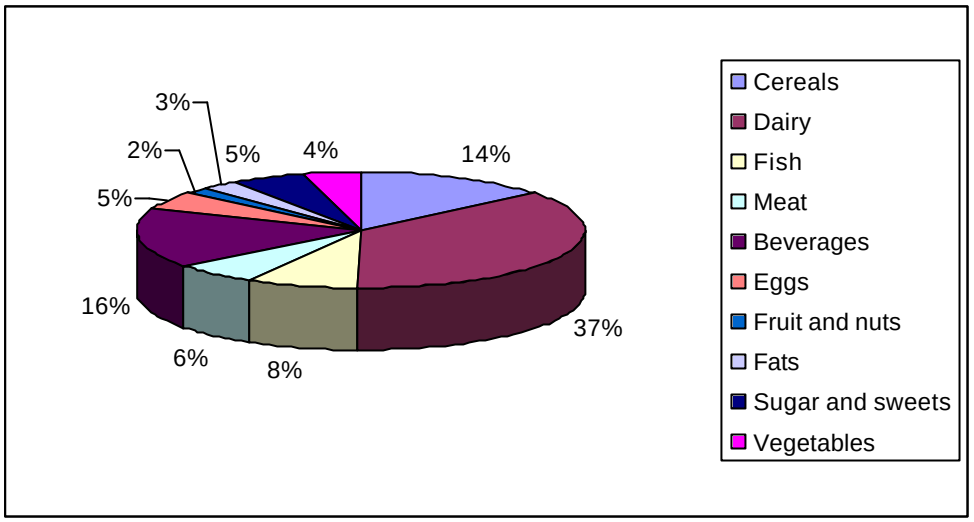


Figure 3.8 Pie chart showing the percentage contribution of various foodstuffs to daily dietary iodine intake in the UK for 1987 (from Pennington, 1990)

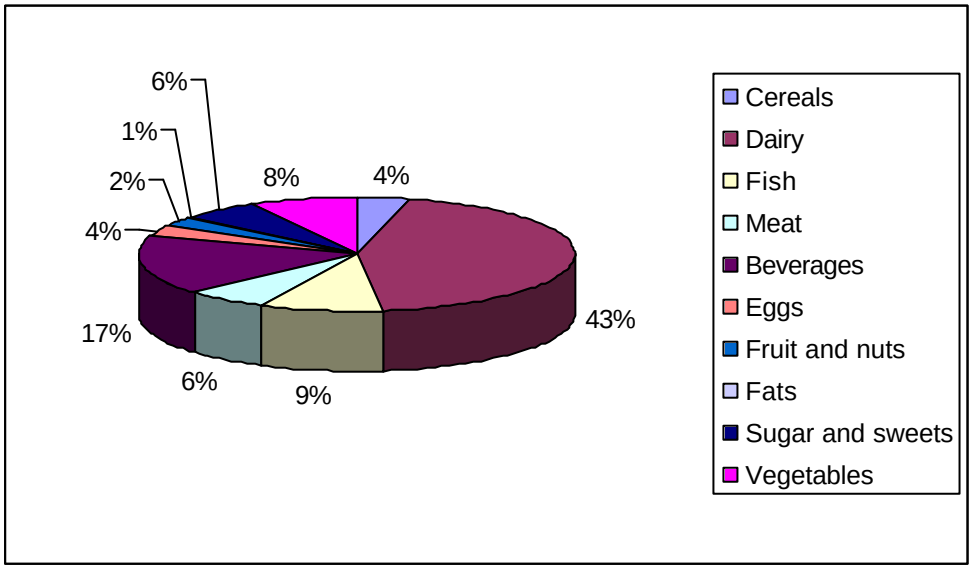


Figure 3.9 Pie chart showing the percentage contribution of various foodstuffs to daily dietary iodine intake in the UK for 1995 (from Maff, 1997)

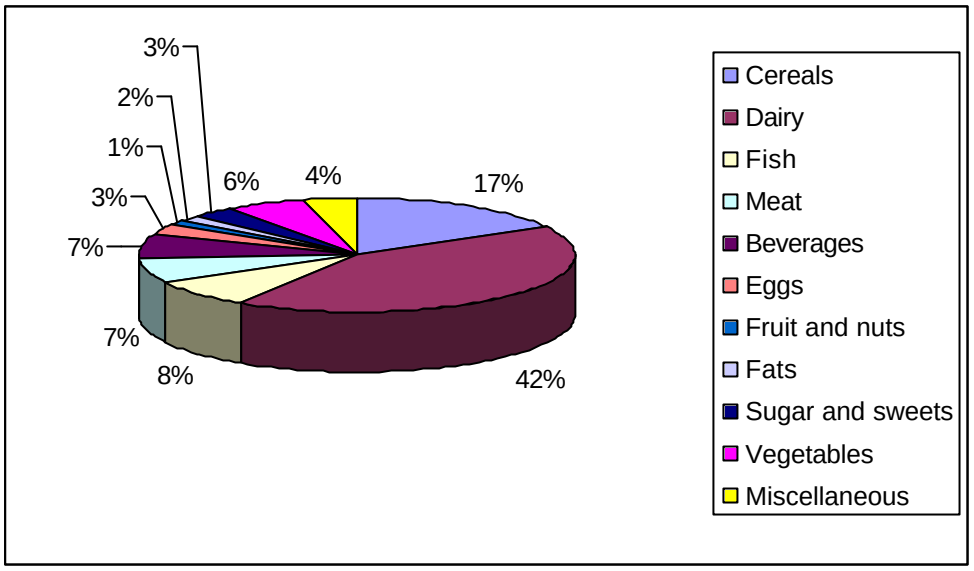


Figure 3.10 Pie chart showing the percentage contribution of various foodstuffs to daily dietary iodine intake in the UK for 1997 - 1998 (from Expert group on vitamins and minerals, 2002)

Table 3.7 Average dietary intakes of iodine from various foodstuffs in the UK

Foodstuff	UK 1982		UK 1987		UK 1995		UK 1997 - 1998	
	µg/day	%	µg/day	%	µg/day	%	µg/day	%
Beer			20.0	9				
Beverages			35.0	15	34.4	17	11.0	7
Cereals	31.0	19	30.0	13	4.1	4	26.0	17
(Bread)					4.3			
Dairy	92.0	55	77.0	33	8.9	44	66.0	42
(Cows milk)					82.4			
Eggs			11.0	5	7.6	4	5.0	3
Fish	8.0	5	17.0	7	18.7	9	12.0	8
Fruit and nuts			4.0	2	2.6	2	2.0	1
(Fruit products)					2.4			
(Nuts)					0.1			
Meat	36.0	22	13.0	6	9.1	6	11.0	7
(Offal)					0.1			
(Poultry)					1.0			
(Carcass)					1.3			
Fats			6.0	3	1.3	1	3.0	2
Sugar and sweets			11.0	5	11.6	6	5.0	3
Vegetables			9.0	4	3.0	8	9.0	6
(Green vegetables)					1.4			
(Potatoes)					10.3			
(Canned vegetables)					1.4			
Miscellaneous							6.0	4
TOTAL	*167	100	233	100	206	100	156	100

* Assumed to be total diet but no information is given for vegetables. Food types in brackets were combined into generic groups for % calculations

Appendix 1 : Listing of full food and diets database

The following pages are an abbreviated listing of the foods and diets database.

The reference number (ref) refers to the citation in which the result is quoted. These are listed in citation number order in the list of references at the end of this report.

Ref	Item	Units	Min	Max	Av	No	Year	Country
184	Drinking water	µg/100ml			0.5		1998	Egypt
194	Cabbage	µg/100g	7.0	24.0			1992-95	China
194	Chicken	µg/100g	5.0	23.0			1992-95	China
194	Drinking water	µg/l	1.0	1.5			1992-95	China
194	Eggs	µg/100g	3.0	21.0			1992-95	China
194	Mutton	µg/100g	6.0	36.0			1992-95	China
194	Wheat	µg/100g	4.0	16.0			1992-95	China
249	Drinking water	ng/ml	0.7	35.9			1995	Japan
267	Meat, egg, milk	µg/100g			3.3	90	1992	China
267	Meat, egg, milk	µg/100g			10.3	22	1992	China
267	Oil crops	µg/100g			5.6	13	1992	China
267	Oil crops	µg/100g			12.9	12	1992	China
267	Other	µg/100g			5.4	18	1992	China
267	Other	µg/100g			10.4	22	1992	China
267	Vegetables	µg/100g			6.6	28	1992	China
267	Vegetables	µg/100g			12.0	21	1992	China
267	Vegetables	µg/100g			20.6	20	1993	China
267	Wheat	µg/100g			3.2	11	1992	China
267	Wheat	µg/100g			6.5	20	1992	China
267	Wheat	µg/100g			9.4	20	1993	China
276	Rice						1993	Japan
284	Drinking water	µg/l	1.0	9.2		10	1992	Togo
284	Millet/Sorghum	µg/kg			14.0		1992	Togo
284	Salt	µg/kg	82.6	344.0		11	1992	Togo
309	Cassava	% intake					1998	Ethiopia
310	Infant Urine	µg/dl			9.9	68	1996	Nigeria
310	Mother Urine	µg/dl			14.5	68	1996	Nigeria
313	I and thyroid						1995	Germany
313	Apple	µg/kg			19.0		1995	Germany
313	Blood sausage	µg/kg			77.0		1995	Germany
313	Bockwurst	µg/kg			976.0		1995	Germany
313	Butter	µg/kg			28.0		1995	Germany
313	Camembert chse	µg/kg			76.0		1995	Germany
313	Caraway	µg/kg			129.0		1995	Germany
313	Chive	µg/kg			192.0		1995	Germany
313	Chocolate	µg/kg			70.0		1995	Germany
313	Choc candies	µg/kg			63.0		1995	Germany
313	Choc pudding	µg/kg			15.0		1995	Germany
313	Cinnamon	µg/kg			182.0		1995	Germany
313	Cocoa	µg/kg			52.0		1995	Germany
313	Coffee	µg/kg			23.0		1995	Germany
313	Cooking salt	µg/kg			2206.0		1995	Germany
313	Crispbread	µg/kg			52.0		1995	Germany
313	Cucumber	µg/kg			43.0		1995	Germany
313	Limburger	µg/kg			132.0		1995	Germany
313	Liver sausage	µg/kg			91.0		1995	Germany
313	Macaroni	µg/kg			50.0		1995	Germany
313	Mackerel	µg/kg			2067.0		1995	Germany
313	Margarine	µg/kg			9.4		1995	Germany
313	Marjoram	µg/kg			678.0		1995	Germany
313	Mustard seeds	µg/kg			40.0		1995	Germany
313	Mutton	µg/kg			102.0		1995	Germany
313	Noodles	µg/kg			43.0		1995	Germany
313	Oat meal	µg/kg			97.0		1995	Germany
313	Oatflakes	µg/kg			39.0		1995	Germany
313	Orange	µg/kg			25.0		1995	Germany
313	Pancake flour	µg/kg			57.0		1995	Germany
313	Paprika sweet	µg/kg			79.0		1995	Germany
313	Parsley	µg/kg			180.0		1995	Germany
313	Pearl barley	µg/kg			42.0		1995	Germany
313	Peeled peas	µg/kg			25.0		1995	Germany
313	Pepper	µg/kg			157.0		1995	Germany
313	Pork	µg/kg			159.0		1995	Germany
313	Potatoes	µg/kg			31.0		1995	Germany
313	Poultry	µg/kg			274.0		1995	Germany
313	Ready-soup	µg/kg			39.0		1995	Germany
313	Rice	µg/kg			21.0		1995	Germany
313	Rolls	µg/kg			38.0		1995	Germany
313	Rusk	µg/kg			20.0		1995	Germany
313	Salami	µg/kg			54.0		1995	Germany
313	Semolina	µg/kg			38.0		1995	Germany
313	Soft cheese	µg/kg			125.0		1995	Germany
313	Sugar	µg/kg			7.6		1995	Germany
313	Toast bread	µg/kg			34.0		1995	Germany
313	Tomato	µg/kg			31.0		1995	Germany
313	Trout	µg/kg			404.0		1995	Germany
313	Vanilla desert	µg/kg			21.0		1995	Germany
313	Wht/ rye bread	µg/kg			24.0		1995	Germany
313	Wheat flour	µg/kg			52.0		1995	Germany
313	Wheat starch	µg/kg			16.0		1995	Germany
313	White beans	µg/kg			21.0		1995	Germany
313	White cabbage	µg/kg			87.0		1995	Germany
314	Barley	µg/kg			90.0	1	1992	Morocco
314	Breast milk	µg/l	10.0	55.0	27.0	14	1992	Morocco
314	Breast milk	µg/l	16.0	78.0	40.0	5	1992	Morocco
314	Cream Milk	µg/l	60.0	94.0	72.0	3	1992	Morocco
314	Sea salt	µg/kg	90.0	160.0	128.0	4	1992	Morocco
314	Skim Milk	µg/l	64.0	50.0	58.0	3	1992	Morocco

Ref	Item	Units	Min	Max	Av	No	Year	Country
313	Curd	µg/kg			328.0		1995	Germany
313	Dill	µg/kg			388.0		1995	Germany
313	Dumpling flour	µg/kg			36.0		1995	Germany
313	Eggs	µg/kg			177.0		1995	Germany
313	French beans	µg/kg			40.0		1995	Germany
313	Gouda cheese	µg/kg			66.0		1995	Germany
313	Herring	µg/kg			2113.0		1995	Germany
313	Honey	µg/kg			35.0		1995	Germany
313	I and thyroid						1995	Germany
313	I and thyroid						1995	Germany
313	Jam	µg/kg			56.0		1995	Germany
313	Kohlrabi	µg/kg			49.0		1995	Germany
313	Lemon	µg/kg			163.0		1995	Germany
313	Lettuce	µg/kg			237.0		1995	Germany
321	Baby-food	µg/100ml	3.3	17.0		23	1993	Aust/Ger
321	Cows milk	µg/l	8.4	27.4	17.4		1993	Aust/Ger
321	Infant formula	µg/l	10.6	24.8	17.0		1993	Aust/Ger
321	Whey-milk	µg/l			13.0		1993	Aust/Ger
322	Drinking water	mg/l			0.5		1985	Jamaica
326	Iodised salt	mg/l	1.2	1.2	1.2	3	1993	India
326	Iodised salt	mg/l	1.2	1.2	1.2	3	1993	India
326	Iodised salt	µg/g			15.0		1992	India
326	Iodised salt	µg/g			30.0		1992	India
326	Iodised salt	mg/l	29.0	31.6	30.2	3	1993	India
326	Iodised salt	mg/l	29.0	31.6	30.2	3	1993	India
326	Iodised salt	µg/g	7.1	73.8	39.8	10	1993	India
326	Iodised salt	µg/g	47.0	52.0		30	1992	India
326	Iodised salt	µg/g	50.0	55.0		30	1993	India
329	< 1 year	µg/day	100.0				1990	USA/ EU
329	1 - 10 years	µg/day	60.0	100.0			1990	USA/ EU
329	10+ years	µg/day	35.0	40.0			1990	USA/ EU
341	Drinking water	µg/l			138.6	24	1996	Malaysia
341	Drinking water	µg/l			0.0		1996	Malaysia
341	Iodised salt	mg/kg			47.1	60	1996	Malaysia
341	Salt	mg/kg			0.8	60	1996	Malaysia
350	Cows milk						1996	Czech
356	Breast milk	µg/dl	1.8	5.4		5	1997	Reunion
356	Drinking water	µg/dl	0.1	1.3		3	1997	Reunion
356	Iodised salt	mg/kg			3.8	1	1997	Reunion
365	Eggs	µg/kg	2303.0	23 592		11	1998	Czech
372	Adult	µg/day	50.0	100.0			1999	Demark
372	Cheese	ng/g	60.0	164.0	121.0	24	1999	Demark
372	Cows milk	ng/g	42.0	162.0	101.0	24	1999	Demark
372	Cream	ng/g	100.0	217.0	110.0	24	1999	Demark
372	Drinking water	ng/ml	2.0	8.0			1999	Demark
372	Drinking water	ng/ml	10.0	30.0			1999	Demark
374	Black gram	µg/100g			14.8	248	1998	India
374	Cassava	µg/100g			7.1	18	1998	India
374	Colocassia	µg/100g			5.4	18	1998	India
374	Cowpea	µg/100g			16.3	248	1998	India
374	Drinking water	µg/l	3.0	31.5	7.4	287	1998	India
374	Field beans	µg/100g			20.1	248	1998	India
374	Finger Millet	µg/100g			7.3	143	1998	India
374	Garlic	µg/100g			6.6	26	1998	India
374	Ginger	µg/100g			13.5	26	1998	India
374	Green gram	µg/100g			11.8	248	1998	India
314	Corn	µg/kg			91.0	1	1992	Morocco
314	Cows milk	µg/l	15.0	33.0	24.0	4	1992	Morocco
314	Drinking water	µg/l			0.9	1	1992	Morocco
314	Drinking water	µg/l			1.1	1	1992	Morocco
314	Drinking water	µg/l	1.1	1.3	1.2	2	1992	Morocco
314	Full Cream	µg/l	6.0	10.0	8.0	6	1992	Morocco
314	Rock salt	µg/kg	420.0	570.0	495.0	4	1992	Morocco
314	Rock salt	µg/kg	460.0	600.0	538.0	4	1992	Morocco
314	Wheat	µg/kg			227.0	1	1992	Morocco
314	Wheatflour	µg/kg			78.0	1	1992	Morocco
316	Cooking salt	mg/kg			0.2		1994	Togo
316	Cooking salt	mg/kg			11.2		1994	France
316	Drinking water	µg/l			2.0		1994	Togo
321	Baby-food	µg/100ml	0.6	15.2		23	1993	Aust/Ger
486	Asparagus	µg/kg			1102.0		1952	World
486	Bacon	µg/kg			77.0		1952	World
486	Barley	µg/kg			92.0		1952	World
486	Beans	µg/kg			245.0		1952	World
486	Beef	µg/kg			28.0		1952	World
486	Beetroot	µg/kg			233.0		1952	World
486	Bread	µg/kg			58.0		1952	World
486	Butter	µg/kg			56.0		1952	World
486	Cabbage	µg/kg			260.0		1952	World
486	Carp	µg/kg			68.0		1952	World
486	Carrots	µg/kg			202.0		1952	World
486	Cauliflower	µg/kg			221.0		1952	World
486	Cereals	µg/kg			65.0		1952	World
486	Cheese	µg/kg			51.0		1952	World
486	Clams	µg/kg			3595.0		1952	World
486	Cod	µg/kg			7493.0		1952	World
486	Cod liver oil	µg/kg			8387.0		1952	World
486	Cows milk	µg/kg			35.0		1952	World
486	Crab	µg/kg			1292.0		1952	World
486	Cranberries	µg/kg			100.0		1952	World
486	Cucumber	µg/kg			400.0		1952	World
486	Eggs	µg/kg			93.0		1952	World
486	Fish oil	µg/kg			4630.0		1952	World
486	Flour	µg/kg			42.0		1952	World
486	Freshwter fish	µg/kg			116.0		1952	World
486	Fruits	µg/kg			159.0		1952	World
486	Gourds	µg/kg			600.0		1952	World
486	Haddock	µg/kg			15941.0		1952	World
486	Halibut	µg/kg			2225.0		1952	World
486	Herring	µg/kg			1358.0		1952	World
486	Lake trout	µg/kg			88.0		1952	World
486	Lard	µg/kg			97.0		1952	World
486	Lettuce	µg/kg			668.0		1952	World
486	Lobster	µg/kg			4744.0		1952	World
486	Mackerel	µg/kg			1031.0		1952	World
486	Maize	µg/kg			43.0		1952	World
486	Mangolds	µg/kg			192.0		1952	World
486	Marine fish	µg/kg			3715.0		1952	World
486	Meat product	µg/kg			50.0		1952	World
486	Milk products	µg/kg			47.0		1952	World
486	Mutton	µg/kg			27.0		1952	World
486	Oats	µg/kg			91.0		1952	World

Ref	Item	Units	Min	Max	Av	No	Year	Country
374	Jobs Tears	µg/100g			8.3	143	1998	India
374	Maize	µg/100g			8.0	143	1998	India
374	Red chillies	µg/100g			14.1	26	1998	India
374	Red gram	µg/100g			19.6	248	1998	India
374	Rice	µg/100g			10.4	143	1998	India
374	Rice beans	µg/100g			9.1	248	1998	India
374	Soya beans	µg/100g			17.6	248	1998	India
374	Sweet Potato	µg/100g			7.4	18	1998	India
395	Drinking water	µg/l	0.1	139.0		55	1999	Denmark
395	Infant formula	µg/l	37.0	138.0		18	1999	Denmark
402	Adult	µg/day	35.0	45.0			1999	Germany
412	Drinking water	µg/l	0.8	3.0	1.5	108	1999	India
412	Rice	µg/100g	3.7	23.5	11.8	42	1999	India
451	Drinking water	µg/l	1.6	1270.0			1986	World
486	Anadrom fish	µg/kg			1029.0		1952	World
486	Apple	µg/kg			277.0		1952	World
486	Sea perch	µg/kg			3105.0		1952	World
486	Sea trout	µg/kg			1028.0		1952	World
486	Shell fish	µg/kg			3866.0		1952	World
486	Shrimps	µg/kg			4987.0		1952	World
486	Sole	µg/kg			1072.0		1952	World
486	Spinach	µg/kg			1636.0		1952	World
486	Tomato	µg/kg			196.0		1952	World
486	Turnips	µg/kg			343.0		1952	World
486	Veal	µg/kg			28.0		1952	World
486	Vegetables	µg/kg			385.0		1952	World
486	Wheat	µg/kg			44.0		1952	World
496	Drinking water	µg/l	0.7	14.8		10	1963	NZealand
496	Drinking water	µg/l	1.1	10.8		11	1963	NZealand
496	Drinking water	µg/l	0.8	9.0		13	1963	NZealand
496	Drinking water	µg/l	3.1	3.1		1	1963	NZealand
532	Cows milk	µµc/l			100 000		1962	USA
560	Asparagus	ng/g	12.0	285.0			1929	USA
560	Beetroot	ng/g	8.0	227.0			1929	USA
560	Cabbage	ng/g			336.0		1929	USA
560	Carrots	ng/g	2.3	197.0			1929	USA
560	Lettuce	ng/g			761.0		1929	USA
560	Potatoes	ng/g	26.0	283.0		92	1929	USA
560	Spinach	ng/g	19.5	694.0			1929	USA
560	String beans	ng/g	29.0	429.0			1929	USA
560	Squash	ng/g			716.0		1929	USA
560	Sweet Potato	ng/g			98.0		1929	USA
560	Turnip	ng/g			223.0		1929	USA
560	Turnip tops	ng/g			433.0		1929	USA
598	Kangkong						1986	Philippine
598	Sweet-Pot Top						1986	Philippine
600	Drinking water	µg/l	1.4	450.0	35.1	225	1992	Sri Lanka
600	Drinking water	µg/l	1.4	450.0	48.8	241	1992	Sri Lanka
605	Drinking water	µg/l	15.0	150.0	55.0	60	1993	Sri Lanka
606	Drinking water	µg/l	11.9	119.0		609	1996	Sri Lanka
612	Adults	µg/day	100.0	200.0	150.0		1969	UK
612	Drinking water	µg/l	1.3	3.7	1.8	9	1989	UK
612	Drinking water	µg/l	0.5	3.8	1.9	9	1989	UK
612	Drinking water	µg/l	2.0	11.9	5.5	7	1989	UK
612	Drinking water	µg/l			6.4	1	1989	USA
612	Drinking water	µg/l			7.7	1	1989	USA

Ref	Item	Units	Min	Max	Av	No	Year	Country
486	Onions	µg/kg			204.0		1952	World
486	Other fish oil	µg/kg			3052.0		1952	World
486	Oysters	µg/kg			4712.0		1952	World
486	Pears	µg/kg			62.0		1952	World
486	Peas	µg/kg			223.0		1952	World
486	Peas/beans	µg/kg			234.0		1952	World
486	Pork	µg/kg			45.0		1952	World
486	Potatoes	µg/kg			197.0		1952	World
486	Rice	µg/kg			39.0		1952	World
486	River bass	µg/kg			115.0		1952	World
486	River perch	µg/kg			194.0		1952	World
486	Rye	µg/kg			84.0		1952	World
486	Salmon	µg/kg			1030.0		1952	World
486	Salmon oils	µg/kg			2450.0		1952	World
486	Sardines	µg/kg			745.0		1952	World
486	Sea bass	µg/kg			471.0		1952	World
654	Spinach	ng/g	19.0	48650.0		35	1972	USA
654	Tomato	ng/g	20.0	660.0		22	1972	USA
654	Turnip, leaf	ng/g	111.0	676.0		22	1972	USA
654	Turnip, root	ng/g	223.0	870.0		4	1972	USA
654	Turnip, all	ng/g	740.0	2080.0		5	1972	USA
654	Wheat, seed	ng/g	trace	168.0		26	1972	USA
657	Adult	µg/day	44.0	162.0			1935	World
657	Adult	µg/day	100.0	200.0			1937	World
657	Adult	µg/day	100.0	200.0			1938	World
657	Adult	µg/day	160.0	200.0			1964	World
657	Breast milk	µg/l	40.0	80.0			1950	World
657	Cabbage	µg/g	0.0	1.0			1972	World
657	Cow colstrm	µg/l	200.0	350.0		5	1953	World
657	Cows milk	µg/l	20.0	70.0			1934	World
657	Cows milk	µg/l	72.0	136.0		5	1953	World
657	Cows milk	µg/l	89.0	94.0		2	1975	World
657	Cretinism	µg/day			< 20		1986	Ind/China
657	English adult	µg/day			220.0		1951	UK
657	Erythrosine	µg	4.0	625.0			1972	World
657	Erythrosine	20 g		850.0			1972	World
657	Goitre Areas	µg/day			< 100		1986	World
657	Goitre occurs	µg/day			< 50		1972	World
657	Hens eggs	µg	4.0	10.0			1968	World
657	Human colstrm	µg/l	50.0	240.0			1950	World
657	Iodised salt						1986	World
657	Japan adult	µg/day			300.0		1974	Japan
657	Sugar	µg/kg	< 1	30.0			1951	World
657	Seaweed	%	0.4	0.6			1950	Japan
657	USA adult	µg/day	238.0	738.0			1970	USA
662	Drinking water	µg/l	3.0	5.0			1923	World
713	Ca, Mg, F						1980	World
715	Crops						1988	Japan
726	Cow's milk	µg/l	60.0	10.0			1930	NZealand
732	Cassava						1982	Zaire/Blg
748	1 - 2 years	µg/day			180.0		1982-89	USA
748	1 Home	µg/day	45.0	1921.0			1986	Japan
748	14 - 16 yr F	µg/day			340.0		1982-89	USA
748	2 years	µg/day			280.0		1982-89	USA
748	30 - 35 yr F	µg/day			260.0		1982-89	USA
748	Adults	µg/day			696.0		1978	USA

Ref	Item	Units	Min	Max	Av	No	Year	Country
612	Drinking water	% intake		20.0			1967	World
612	Drinking water	% intake		10.0			1976	World
612	Drinking water	µg/l	44.0	100.0			1968	Egypt
612	Drinking water	µg/l	7.0	18.0			1968	Egypt
612	Drinking water	µg/l			<0.1	1	1989	Canada
654	Asparagus	ng/g	12.0	3780.0		7	1972	USA
654	Bean pod/seed	ng/g	29.0	1500.0		32	1972	USA
654	Bean seed	ng/g	21.0	83.0		15	1972	USA
654	Beets leaves	ng/g	248.0	1435.0		8	1972	USA
654	Beets, roots	ng/g	8.0	416.0		18	1972	USA
654	Cabbage	ng/g	16.0	791.0		85	1972	USA
654	Carrots	ng/g	2.0	2400.0		35	1972	USA
654	Cucumber	ng/g	44.0	940.0		8	1972	USA
654	Lettuce	ng/g	71.0	6740.0		41	1972	USA
654	Oats seed	ng/g	10.0	175.0		13	1972	USA
654	Oats straw	ng/g	335.0	764.0		4	1972	USA
654	Onion	ng/g	46.0	479.0		23	1972	USA
654	Potatoes	ng/g	7.0	446.0		360	1972	USA
748	Frozen chicken	µg/port		4300.0			1993	USA
748	Grains	% intake	17.0	38.0			1982-89	USA
748	Hospital meal	µg/meal	195.0	1290.0			1986	Japan
748	Infants	µg/day			576.0		1978	USA
748	I- glycerol	mg/tab			15.0		1991	Devloped
748	Isopropamide	mg/tab			1.8		1991	Devloped
748	Kelp	mg/day			100.0		1991	Japan
748	Main foods						1993	Devloped
748	Marine fish	µg/kg			832.0		1970	?
748	Meat	µg/port			6.5		1970	USA
748	Meat	µg/kg	1.6	260.0			1980	Greece
748	Mineral tablets	µg	100.0	150.0			1991	USA
748	Mineral tablets	µg	100.0	500.0			1993	Germany
748	Mixed dishes	% intake	6.0	10.0			1982-89	USA
748	Puddings	% intake	3.0	10.0			1982-89	USA
748	Teenage males	µg/day			550.0		1982-89	USA
748	Toddlers	µg/day			728.0		1978	USA
748	Vegetable	% intake	4.0	8.0			1982-89	USA
748	Purification tabs	mg/l			8.0		1993	USA
771	Amaranth leaf	µg/100g			16.3	3	1992	India
771	Apple	µg/100g			5.3	3	1992	India
771	Beetroot	µg/100g			16.7	3	1992	India
771	Clove	µg/100g			6.1	4	1992	India
771	Cows milk	µg/100g			12.3	10	1992	India
771	Eggs	µg/100g			50.7	3	1992	India
771	Freshwater fish	µg/100g			79.0	3	1992	India
771	Grapes	µg/100g			9.6	3	1992	India
771	Ground nut	µg/100g			55.3	3	1992	India
771	Ladies finger	µg/100g			4.5	3	1992	India
771	Marine prawns	µg/100g			11.3	5	1992	India
771	Mint leaves	µg/100g			8.7	3	1992	India
771	Pea grain	µg/100g			34.7	3	1992	India
771	Pepper	µg/100g			35.6	3	1992	India
771	Potatoes	µg/100g			1.9	3	1992	India
771	Ragi	µg/100g			18.3	3	1992	India
771	Red chillies	µg/100g			40.0	5	1992	India
771	Rice	µg/100g			43.8	6	1992	India
771	Tomato	µg/100g			1.5	3	1992	India
748	Amiodarone	mg/tab				75.0		1991	Devloped
748	Animal flesh	% intake	4.0	12.0			1982-89	USA
748	Bread	µg/100g				1.6	1970	Devloped
748	Bread						1993	Greece
748	Chicken	µg/port				126.0	1970	Greece
748	Cows milk	µg/l				41.5	1970	Greece
748	Cows milk	µg/l	35.0	4000.0		100.0	1993	World
748	Cows milk	µg/l	360.0	1320.0			1978	USA
748	Cows milk	µg/l	113.0	197.0			1985	UK
748	Cows milk						1993	Devloped
748	Cows milk						1993	World
748	Dairy	% intake	20.0	59.0			1982-89	USA
748	Eggs	µg				13.4	1970	Greece
748	Eggs	µg		170.0			1970	USA
748	Eggs	% intake	2.0	4.0			1982-89	USA
748	Fish	µg/kg				64.0	1970	Greece
748	Food colour						1993	Devloped
748	Freshwatr fish	µg/kg				30.0	1970	?
772	Green veg	µg/day				1.4	1995	UK
772	Green veg	µg/kg				40.0	1995	UK
772	Meat carcass	µg/day				1.3	1995	UK
772	Meat carcass	µg/kg				50.0	1995	UK
772	Meat products	µg/day				9.1	1995	UK
772	Meat products	µg/kg				202.0	1995	UK
772	Nuts	µg/day				0.1	1995	UK
772	Nuts	µg/kg				40.0	1995	UK
772	Offal	µg/day				0.1	1995	UK
772	Offal	µg/kg				92.0	1995	UK
772	Oils and Fats	µg/day				1.3	1995	UK
772	Oils and Fats	µg/kg				44.0	1995	UK
772	Other cereals	µg/day				4.1	1995	UK
772	Other cereals	µg/kg				40.0	1995	UK
772	Other veg	µg/day				3.0	1995	UK
772	Other veg	µg/kg				40.0	1995	UK
772	Potatoes	µg/day				10.3	1995	UK
772	Potatoes	µg/kg				79.0	1995	UK
772	Poultry	µg/day				1.0	1995	UK
772	Poultry	µg/kg				58.0	1995	UK
772	Sugar/Preserv	µg/day				11.6	1995	UK
772	Sugar/Preserv	µg/kg				176.0	1995	UK
773	Cows milk	µg/100g	19.0	44.0		30.0	1996	UK
774	Milks/creams	µg/kg	10.8	613.0		400	1999	UK
775	Adult	µg/day	176.0	243.0		255.0	1990	UK
775	Adult	µg/day	70.0				1991	UK
775	Adult	µg/day	140.0				1991	UK
775	Adult	µg/day		1000.0			1991	UK
775	Children	µg/day	140.0	710.0			1984	USA
775	Cows milk	ng/g	23.0	104.0			1965	UK
775	Cows milk	ng/g	30.0	280.0			1985	UK
775	Infant	µg/day	50.0				1991	UK
775	Marine fish	ng/g		1200.0			1991	UK
775	Seaweed	ng/g		5000.0			1991	UK
777	Cows milk	µg/100g				18.0	1980	UK
777	Eggs	µg/100g				55.0	1980	UK
777	Haddock	µg/100g				124.0	1980	UK
777	Milk powder	µg/100g				142.0	1980	UK

Ref	Item	Units	Min	Max	Av	No	Year	Country
771	White mustard	µg/100g			50.6	5	1992	India
772	Adult	µg/day	151.0	209.0			1995	UK
772	Beverages	µg/day			34.4		1995	UK
772	Beverages	µg/kg			40.0		1995	UK
772	Bread	µg/day			4.3		1995	UK
772	Bread	µg/kg			40.0		1995	UK
772	Canned veg	µg/day			1.4		1995	UK
772	Canned veg	µg/kg			40.0		1995	UK
772	Cows milk	µg/day			82.4		1995	UK
772	Cows milk	µg/kg			291.0		1995	UK
772	Dairy products	µg/day			8.9		1995	UK
772	Dairy products	µg/kg			151.0		1995	UK
772	Eggs	µg/day			7.6		1995	UK
772	Eggs	µg/kg			505.0		1995	UK
772	Fish	µg/day			18.7		1995	UK
772	Fish	µg/kg			1445.0		1995	UK
772	Fruit	µg/day			2.6		1995	UK
772	Fruit	µg/kg			40.0		1995	UK
772	Fruit products	µg/day			2.4		1995	UK
772	Fruit products	µg/kg			54.0		1995	UK
779	Dairy/ eggs	µg/kg			370.0		1985	UK
779	Egg products	µg/day			11.0		1987	UK
779	Fats	µg/day			6.0		1987	UK
779	Fish	µg/kg			1120.0		1990-91	UK
779	Fish	µg/kg			1270.0		1985	UK
779	Fish	µg/kg	110.0	3280.0			1990-91	UK
779	Fish products	µg/day			17.0		1987	UK
779	Fruit products	µg/kg			50.0		1990-91	UK
779	Fruit products	µg/kg			90.0		1985	UK
779	Fruit and nuts	µg/day			4.0		1987	UK
779	Meat products	µg/day			13.0		1987	UK
779	Meat products	µg/kg			1510.0		1985	UK
779	Meat products	µg/kg	50.0	180.0			1990-91	UK
779	Milk products	µg/day			77.0		1987	UK
779	Nuts	µg/kg	90.0	210.0			1990-91	UK
779	Oils and Fats	µg/kg			130.0		1985	UK
779	Oils and Fats	µg/kg			280.0		1990-91	UK
779	Other cereals	µg/kg			90.0		1990-91	UK
779	Other cereals	µg/kg			180.0		1985	UK
779	Other veg/nuts	µg/kg			10.0		1990-91	UK
779	Other veg/nuts	µg/kg			30.0		1985	UK
779	Seaweed	µg/kg	4300.0	2660000.0			1990-91	UK
779	Sugar/Preserve	µg/day			11.0		1987	UK
779	Sugar/Preserve	µg/kg			150.0		1990-91	UK
779	Sugar/Preserve	µg/kg			410.0		1985	UK
779	Vegetables	µg/day			9.0		1987	UK
779	Yeast/veg exrct	µg/kg	180.0	260.0			1990-91	UK
798	Demi-veg F	µg			172.0	24	1992	UK
798	Demi-veg M	µg			253.0	13	1992	UK
798	Lact-ovo-veg F	µg			167.0	36	1992	UK
798	Lact-ovo-veg M	µg			216.0	16	1992	UK
798	Nationwide F	µg			190.0	377	1989	UK
798	Nationwide M	µg			244.0	386	1989	UK
798	Vegan F	µg			66.0	20	1992	UK
798	Vegan M	µg			98.0	18	1992	UK
801	Adult	µg/day	192.0	290.0			1974-78	USA
778	Cows milk	µg/kg	40.0	310.0	150.0	52	1990-91	UK
779	Adult	µg/day			16.0		1992	Germany
779	Adult	µg/day			166.0		1990-91	UK
779	Adult	µg/day			173.0		1985	UK
779	Adult	µg/day			250.0		1992	Finland
779	Adult	µg/day			402.0		1989	Netherland
779	Adult	µg/day			1046.0		1987	Canada
779	Adult	µg/day	260.0	410.0			1989	USA
779	Beer	µg/day			20.0		1987	UK
779	Beverages	µg/kg			0.0		1990-91	UK
779	Beverages	µg/kg			20.0		1985	UK
779	Beverages	µg/day			35.0		1987	UK
779	Biscuits	µg/kg	30.0	110.0			1990-91	UK
779	Bread	µg/kg			30.0		1990-91	UK
779	Bread	µg/kg			40.0		1985	UK
779	Canned veg	µg/kg			20.0		1990-91	UK
779	Canned veg	µg/kg			30.0		1985	UK
779	Cereal product	µg/day			30.0		1987	UK
779	Cows milk	µg/kg			150.0		1985	UK
779	Dairy/eggs	µg/kg			340.0		1990-91	UK
813	15-18 Females	oz/day	0.0	17.0	5.3		1970	Tasmania
813	15-18 Females	µg/day			120.0		1970	Tasmania
813	15-18 Males	oz/day	0.0	20.0	8.3		1970	Tasmania
813	15-18 Males	µg/day			150.0		1970	Tasmania
813	18-35 Females	oz/day	0.0	14.0	3.6		1970	Tasmania
813	18-35 Females	µg/day			100.0		1970	Tasmania
813	18-35 Males	oz/day	0.0	21.0	6.9		1970	Tasmania
813	18-35 Males	µg/day			140.0		1970	Tasmania
813	35-64 Females	oz/day	0.0	11.0	3.5		1970	Tasmania
813	35-64 Females	µg/day			90.0		1970	Tasmania
813	35-64 Males	oz/day	0.0	23.0	6.0		1970	Tasmania
813	35-64 Males	µg/day			110.0		1970	Tasmania
813	3-7 Females	oz/day	0.0	13.0	4.1		1970	Tasmania
813	3-7 Females	µg/day	70.0	80.0			1970	Tasmania
813	3-7 Males	oz/day	1.0	19.0	4.1		1970	Tasmania
813	3-7 Males	µg/day	70.0	80.0			1970	Tasmania
813	7-11 Females	oz/day	0.0	17.0	5.1		1970	Tasmania
813	7-11 Females	µg/day	100.0	125.0			1970	Tasmania
813	7-11 Males	oz/day	0.0	18.0	5.8		1970	Tasmania
813	7-11 Males	µg/day	100.0	125.0			1970	Tasmania
813	Iodised bread	µg/g			20.0		1970	Tasmania
828	Cereal product	µg/day			31.0		1982	UK
828	Cows milk	µg/day			92.0		1982	UK
828	Fish products	% intake			5.0		1982	UK
828	Meat products	µg/day			36.0		1982	UK
830	Bread/cereals	µg/kg			100.0	18	1964	World
830	Dairy products	µg/kg			130.0	18	1964	World
830	Eggs	µg/kg			260.0	11	1964	World
830	Fruits	µg/kg			40.0	18	1964	World
830	Meat products	µg/kg			260.0	12	1964	World
830	Seafood	µg/kg			660.0	7	1964	World
830	Vegetables	µg/kg			320.0	13	1964	World
831	Adult	µg/day	176.0	243.0	243.0		1990	UK
834	0 - 6 months	µg/ day			40.0		1993	USA/ EU
834	1 - 3 years	µg/ day			70.0		1993	USA/ EU
834	11 - 51+ years	µg/ day			150.0		1993	USA/ EU

Ref	Item	Units	Min	Max	Av	No	Year	Country
801	Beverages	µg/day	16.0	61.0			1974-78	USA
801	Cereals	µg/day	120.0	317.0			1974-78	USA
801	Cows milk	µg/l	20.0	1320.0			1974-78	USA
801	Dairy products	µg/day	427.0	534.0			1974-78	USA
801	Fruit	µg/day	3.8	8.4			1974-78	USA
801	Leafy Veg	µg/day	0.7	0.9			1974-78	USA
801	Legume Veg	µg/day	1.2	2.2			1974-78	USA
801	Meat,/fish/poul	µg/day	80.0	103.0			1974-78	USA
801	Other Veg	µg/day	1.4	2.3			1974-78	USA
801	Oils and Fats	µg/day	3.5	7.5			1974-78	USA
801	Potatoes	µg/day	2.7	6.2			1974-78	USA
801	Root Veg	µg/day	0.3	0.6			1974-78	USA
801	Sugars	µg/day	95.0	261.0			1974-78	USA
807	Cows milk	µg/l	63.0	1610.0			1972	USA
813	11-15 Females	oz/day	0.0	22.0	6.1		1970	Tasmania
813	11-15 Females	µg/day			115.0		1970	Tasmania
813	11-15 Males	oz/day	1.0	22.0	7.3		1970	Tasmania
813	11-15 Males	µg/day			135.0		1970	Tasmania
813	1-3 Females	oz/day	0.0	8.0	2.5		1970	Tasmania
813	1-3 Females	µg/day	55.0	69.0			1970	Tasmania
813	1-3 Males	oz/day	0.0	9.0	2.5		1970	Tasmania
813	1-3 Males	µg/day	55.0	60.0			1970	Tasmania
838	Recomm Min	µg/day	160.0				1993	Canada
839	Bread						1963	Australia
839	Cows milk	µg/l		1000.0			1970-80	Australia
839	Drinking water	µg/l		1.0			Pre 1971	Australia
839	Iodised salt	mg/kg	25.0	40.0			1993	Australia
840	Adult	µg/day	100.0	20 000			1993	Japan
840	Seaweed	wt%	0.0	0.5			1993	Japan
841	Beef	µg/kg			187.0		1993	Germany
841	Beet leaf	µg/kg			196.0	18	1993	Germany
841	Beet leaf	µg/kg			383.0	47	1993	Germany
841	Blood sausage	µg/kg			218.0		1993	Germany
841	Bockwurst	µg/kg			630.0		1993	Germany
841	Bread	µg/kg			31.0		1993	Germany
841	Breast milk	µg/l			14.0		1982	Germany
841	Breast milk	µg/l			19.0		1987	Germany
841	Breast milk	µg/l			36.0		1991	Germany
841	Butter	µg/kg			36.0		1993	Germany
841	Cauliflower	µg/kg			125.0		1993	Germany
841	Cheese	µg/kg			259.0		1993	Germany
841	Cows milk	µg/l			17.0		1985	Germany
841	Cows milk	µg/l			53.0		1987	Germany
841	Cows milk	µg/l			81.0		1989	Germany
841	Cows milk	µg/kg			738.0		1993	Germany
841	Cucumber	µg/kg			336.0		1993	Germany
841	Drinking water	µg/l	0.9	9.0			1993	Germany
841	Eggs	µg/kg			292.0		1993	Germany
841	Goats milk	µg/l			5.1		1993	Germany
841	Goats milk	µg/l			27.0		1993	Germany
841	Goats milk	µg/l			34.0		1993	Germany
841	Goats milk	µg/l			111.0		1993	Germany
841	Goats milk	µg/l			225.0		1993	Germany
841	Goats milk	µg/l			1181.0		1993	Germany
841	Grass	µg/l			59.0	24	1993	Germany
841	Grass	µg/kg			104.0	106	1993	Germany
834	4 - 6 years	µg/ day			90.0		1993	USA/ EU
834	6 - 12 months	µg/ day			50.0		1993	USA/ EU
834	7 - 10 years	µg/ day			120.0		1993	USA/ EU
834	Breast milk	µg/dl			1.2		1993	Germany
834	Breast milk	µg/dl			2.7		1993	Italy
834	Breast milk	µg/dl			9.5		1993	France
834	Breast milk	µg/dl			17.8		1993	USA
834	Dietary req l	µg/day			50.0		1993	World
834	Infant formula	µg/dl			5.0		1993	USA/ EU
834	Lactating F	µg/ day			200.0		1993	USA/ EU
834	Pregnant F	µg/ day			175.0		1993	USA/ EU
835	0 - 6 months	µg/ day	10.0	20.0			1993	USA
835	1 - 10 years	µg/ day	20.0	30.0			1993	USA
835	10 - 20 years	µg/ day	30.0	60.0			1993	USA
835	Adults	µg/ day	50.0	200.0			1993	USA
835	Europe	µg/ day	30.0	60.0			1993	Europe
835	Human milk						1993	USA
837	Bread	µg/slice	3.0	150.0			1965-67	UK
838	Canadian pop	µg/day			1000.0		1993	Canada
838	Cows milk	µg/l			380.0		1993	Canada
838	Iodised salt	µg/g			76.0		1993	Canada
838	Infants 1 - 4 yr	µg/day			250.0		1993	Canada
847	Adult	µg/day			255.0		1993	UK
847	Adult	µg/day	116.0	1051.0	323.0	200	1977-79	UK
847	Cows milk	µg/l	130.0	200.0			1988	UK
872	Iodised salt	mg/kg			3.8		1922	Switzland
872	Iodised salt	mg/kg			7.5		1962	Switzland
872	Iodised salt	mg/kg			15.0		1980	Switzland
872	Iodised salt	mg/kg			25.0		1999	Switzland
879	Eggs	µg/kg	870.0	4767.0			1999	Czech
884	Breast milk	µg/l	892.0	2170.0		50	1999	Korea
894	Adult	µg/day			110.0		1999	Ukraine
894	Adult	µg/day			1770.0		1999	Japan
931	Cows milk	µg/kg			311.0	220	1999	UK
961	Wheat	µg/g	0.0	0.0	0.0	38	2001	Austria
1082	Drinking water	µg/l	5.0	50.0			1989	China
1083	Adult	µg/day			150.0		1996	World
1086	Adult	mg/day			0.1		1997	NZealand
1086	Adult	mg/day			0.2		1997	China
1086	Adult	mg/day			0.3		1997	UK
1086	Adult	mg/day	0.2	0.3			1985 -91	UK
1086	Adult	mg/kg/bw		0.0			1997	UK
1086	Adult	mg/day	0.1	0.1			1997	UK
1086	Beverages	mg/kg			0.0	400	1997	UK
1086	Bread	mg/kg			0.1	400	1997	UK
1086	Canned veg	mg/kg			0.0	400	1997	UK
1086	Carcass	mg/kg			0.1	400	1997	UK
1086	Cereals	mg/kg			0.1	400	1997	UK
1086	Cows milk	mg/kg			0.2		1991	UK
1086	Cows milk	mg/kg			0.3		1995	UK
1086	Cows milk	mg/kg			0.3		1999	UK
1086	Cows milk	mg/kg			0.3	400	1997	UK
1086	Dairy product	mg/kg			0.4	400	1997	UK
1086	Eggs	mg/kg			0.5	400	1997	UK
1086	Eggs	mg/kg			0.9		1997	China
1086	Fish	mg/kg			0.8	31	1994	UK

Ref	Item	Units	Min	Max	Av	No	Year	Country
841	Herring	µg/kg			1280.0		1993	Germany
841	Lettuce	µg/kg			610.0		1993	Germany
841	Maize	µg/kg			66.0	34	1993	Germany
841	Maize	µg/kg			91.0	78	1993	Germany
841	Men	µg/day			57.0	392	1988	Germany
841	Men	µg/day			61.0	392	1991	Germany
841	Pork	µg/kg			159.0		1993	Germany
841	Pork sausage	µg/kg			134.0		1993	Germany
841	Potatoes	µg/kg			23.0		1993	Germany
841	Potatoes	µg/kg			82.0	8	1993	Germany
841	Red clover	µg/kg			58.0	6	1993	Germany
841	Red clover	µg/kg			111.0	12	1993	Germany
841	Rice	µg/kg			24.0		1993	Germany
841	Tomato	µg/kg			82.0		1993	Germany
841	Trout	µg/kg			76.0		1993	Germany
841	Wheat	µg/kg			15.0	175	1993	Germany
841	Wheat meal	µg/kg			44.0		1993	Germany
841	White cabbage	µg/kg			90.0	6	1993	Germany
841	White cabbage	µg/kg			171.0		1993	Germany
841	Women	µg/day			45.0	392	1991	Germany
841	Women	µg/day			51.0	392	1988	Germany
843	Volatile Iodine						1993	Europe
847	Adult	µg/day			86.3		1976	UK
847	Adult	µg/day			100.0		1960's	UK
1098	Adult	µg/day			323.0		1982	UK
1098	Adult	µg/day			340.0		1982	Finland
1098	Adult	µg/day			446.0		1979	Canada
1098	Adult	µg/day			696.0		1981	USA
1098	Canned cherry	µg/g			113.0		1982-84	Japan
1098	Hospital meal	µg/day	89.0	4746.0		30	1982-84	Japan
1098	Adult meal	µg/day	45.0	1921.0		28	1982-84	Japan
1098	School meal	µg/day	18.0	43.0		10	1982-84	Japan
1098	Uni meal	µg/day	47.0	203.0		13	1982-84	Japan
1098	Red fish paste	µg/g			8.0		1982-84	Japan
1098	Vienna sausage	µg/g	3.2	45.0			1982-84	Japan
1099	Drinking water	µg/l	< 0.05	>1		84	1994	India
1141	Cabbage	µg/100g	3.6	23.5	11.3	44	2003	China
1141	Drinking water	µg/l	0.1	4.1	2.3	10	2003	China
1141	Drinking water	µg/l	78.0	100.0	88.7	5	2003	China
1141	Rock salt	µg/g	0.3	0.3	0.3	2	2003	China
1141	Wheat	µg/100g	3.2	38.9	14.7	75	2003	China
1142	Barley	ng/g	10.0	25.0	17.0	7	2003	Morocco
1142	Carrot	ng/g	18.0	31.0	25.0	7	2003	Morocco
1142	Drinking water	µg/l	1.6	2.8	0.5	11	2003	Morocco
1142	Drinking water	µg/l	17.8	35.2	3.1	8	2003	Morocco
1142	Iodised salt	µg/g	0.1	12.0	5.1	3	2002	Morocco
1142	Potatoes	ng/g			10.0	1	2003	Morocco
1142	Runner bean	ng/g	10.0	12.0	9.0	4	2003	Morocco
1142	Wheat	ng/g			40.0	1	2003	Morocco
1151	Cereal	µg/day			26.0		1997-98	UK
1151	Dairy products	µg/day			66.0		1997-98	UK
1151	Eggs	µg/day			5.0		1997-98	UK
1151	Fat spreads	µg/day			3.0		1997-98	UK
1151	Meats	µg/day			11.0		1997-98	UK
1151	Fish	µg/day			12.0		1997-98	UK
1151	Vegetables	µg/day			9.0		1997-98	UK

Ref	tem	Units	Min	Max	Av	No	Year	Country
1151	Fruits & nuts	µg/day			2.0		1997-98	UK
1151	Sugar/confect	µg/day			5.0		1997-98	UK
1086	Fish	mg/kg			1.3	400	1997	UK
1151	Beverages	µg/day			11.0		1997-98	UK
1151	Miscellaneous	µg/day			6.0		1997-98	UK
1086	Fresh fruit	mg/kg			0.0	400	1997	UK
1086	Fruit product	mg/kg			0.1	400	1997	UK
1086	Green veg	mg/kg			0.0	400	1997	UK
1086	Meat	mg/kg			0.9		1991	UK
1086	Meat product	mg/kg			0.1	400	1997	UK
1086	Nuts	mg/kg			0.1		1991	UK
1086	Nuts	mg/kg			0.2		1994	UK
1086	Nuts	mg/kg			0.3	400	1997	UK
1086	Offal	mg/kg			0.1	400	1997	UK
1086	Oils and Fats	mg/kg			0.2	400	1997	UK
1086	Other veg	mg/kg			0.0	400	1997	UK
1086	Potatoes	mg/kg			0.1	400	1997	UK
1086	Potatoes	mg/kg			0.5		1997	China
1086	Poultry	mg/kg			0.1	400	1997	UK
1086	Sugar/Preserv	mg/kg			0.3	400	1997	UK
1088	Drinking water	µg/l	3.0	84.0	28.1	15	1998	Sri Lanka
1094	Drinking water	µg/l	0.0	70.0			1996	World
1097	Cows milk	µg/l			22.0		1960-97	Poland
1097	Cows milk	µg/l	205.0	757.0			1998	Poland
1097	Eggs	µg/egg	18.3	187.0			1998	Poland
1098	Adult	µg/day			108.0		1979	Yugoslav
1098	Adult	µg/day			210.0		1982	Nethrland
1098	Adult	µg/day			305.0		1984	NZealand

Appendix 2 : Listing of iodine in foods sub-database

The reference number (ref) refers to the citation in which the result is quoted. These are listed in citation number order in the list of references at the end of this report.

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Baby-food	Baby-food	µg/kg	6.3	151.7		23	1993	Austria/ Germany	321
Baby-food	Baby-food	µg/kg	33	170		23	1993	Austria/ Germany	321
Baby-food	Infant formula	µg/l	10.6	24.8	17		1993	Austria/ Germany	321
Baby-food	Infant formula	µg/l	37	138		18	1999	Denmark	395
Baby-food	Infant formula	µg/l			500		1993	USA/ Europe	834
Beverages	Beverages	µg/kg			40		1995	UK	772
Beverages	Beverages	µg/kg			0		1990-1991	UK	779
Beverages	Beverages	µg/kg			20		1985	UK	779
Beverages	Beverages	µg/kg			30	400	1997	UK	1086
Beverages	Coffee	µg/kg			2.2	9	1995	Germany	313
Beverages	Coffee	µg/kg			23		1995	Germany	313
Cereal	Rye	µg/kg			84		1952	World	486
Cereal	Ragi	µg/kg			183	3	1992	India	771
Cereal	Pea grain	µg/kg			347	3	1992	India	771
Cereal	Cereals	µg/kg			65		1952	World	486
Cereal	Cereals	µg/kg			130	400	1997	UK	1086
Cereal	Oil crops	µg/kg			56	13	1992	China	267
Cereal	Oil crops	µg/kg			129	12	1992	China	267
Cereal	Other	µg/kg			54	18	1992	China	267
Cereal	Other	µg/kg			104	22	1992	China	267
Cereal	Other cereals	µg/kg			40		1995	UK	772
Cereal	Other cereals	µg/kg			90		1990-1991	UK	779
Cereal	Other cereals	µg/kg			180		1985	UK	779
Cereal	Corn	µg/kg			91	1	1992	Morocco	314
Cereal	Jobs Tears	µg/kg			82.5	143	1998	India	374
Cereal	Finger Millet	µg/kg			73	143	1998	India	374
Cereal	Millet and Sorghum	µg/kg			14		1992	Togo	284
Cereal	Maize	µg/kg			80	143	1998	India	374
Cereal	Maize	µg/kg			330		1998	India	374
Cereal	Maize	µg/kg			43		1952	World	486
Cereal	Maize	µg/kg			66	34	1993	Germany	841
Cereal	Maize	µg/kg			91	78	1993	Germany	841
Cereal	Oat meal	µg/kg			8.7	9	1995	Germany	313
Cereal	Oat meal	µg/kg			97		1995	Germany	313
Cereal	Oatflakes	µg/kg			3.4	9	1995	Germany	313
Cereal	Oatflakes	µg/kg			39		1995	Germany	313
Cereal	Oats	µg/kg			91		1952	World	486
Cereal	Oats seed	µg/kg	10	175		13	1972	USA	654
Cereal	Oats straw	µg/kg	335	764		4	1972	USA	654
Cereal	Rice	µg/kg			1.8	9	1995	Germany	313
Cereal	Rice	µg/kg			21		1995	Germany	313
Cereal	Rice	µg/kg			104	143	1998	India	374
Cereal	Rice	µg/kg			400		1998	India	374
Cereal	Rice	µg/kg	37	235	118	42	1999	India	412

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Cereal	Rice	µg/kg			39		1952	World	486
Classification	**Item**	**Units**	**Min**	**Max**	**Average**	**No**	**Year**	**Country**	**Reference**
Cereal	Rice	µg/kg			438	6	1992	India	771
Cereal	Rice	µg/kg			24		1993	Germany	841
Cereal	Barley	µg/kg			90	1	1992	Morocco	314
Cereal	Barley	µg/kg			92		1952	World	486
Cereal	Barley	µg/kg	10	25	17	7	2003	Morocco	1142
Cereal	Pearl barley	µg/kg			3.7	9	1995	Germany	313
Cereal	Pearl barley	µg/kg			42		1995	Germany	313
Cereal	Wheat	µg/kg	40	160			1992-1995	China	194
Cereal	Wheat	µg/kg			32	11	1992	China	267
Cereal	Wheat	µg/kg			65	20	1992	China	267
Cereal	Wheat	µg/kg			94	20	1993	China	267
Cereal	Wheat	µg/kg			227	1	1992	Morocco	314
Cereal	Wheat	µg/kg			44		1952	World	486
Cereal	Wheat	µg/kg			15	175	1993	Germany	841
Cereal	Wheat	µg/kg	2	30	6.1	38	2001	Austria	961
Cereal	Wheat	µg/kg	31.7	388.7	146.9	75	2003	China	1141
Cereal	Wheat	µg/kg			40	1	2003	Morocco	1142
Cereal	Wheat, seed	µg/kg	0.0001	168		26	1972	USA	654
Cereal	Bread	µg/kg			58		1952	World	486
Cereal	Bread	µg/kg			16		1970	Greece	748
Cereal	Bread	µg/kg			40		1995	UK	772
Cereal	Bread	µg/kg			30		1990 - 1991	UK	779
Cereal	Bread	µg/kg			40		1985	UK	779
Cereal	Bread	µg/kg			31		1993	Germany	841
Cereal	Bread	µg/kg			140	400	1997	UK	1086
Cereal	Bread and cereals	µg/kg			100	18	1964	World	830
Cereal	Crispbread	µg/kg			4.8	9	1995	Germany	313
Cereal	Crispbread	µg/kg			52		1995	Germany	313
Cereal	Rolls	µg/kg			3	9	1995	Germany	313
Cereal	Rolls	µg/kg			38		1995	Germany	313
Cereal	Rusk	µg/kg			1.9	9	1995	Germany	313
Cereal	Rusk	µg/kg			20		1995	Germany	313
Cereal	Toasting bread	µg/kg			2.2	9	1995	Germany	313
Cereal	Toasting bread	µg/kg			34		1995	Germany	313
Cereal	Wheat and rye bread	µg/kg			1.4	9	1995	Germany	313
Cereal	Wheat and rye bread	µg/kg			24		1995	Germany	313
Cereal	Iodised bread	µg/kg			20000		1970	Tasmania	813
Cereal	Dumpling flour	µg/kg			3.2	9	1995	Germany	313
Cereal	Dumpling flour	µg/kg			36		1995	Germany	313
Cereal	Flour	µg/kg			42		1952	World	486
Cereal	Pancake flour	µg/kg			5.1	9	1995	Germany	313
Cereal	Pancake flour	µg/kg			57		1995	Germany	313
Cereal	Wheatflour	µg/kg			4.3	9	1995	Germany	313
Cereal	Wheatflour	µg/kg			52		1995	Germany	313
Cereal	Wheat meal	µg/kg			44		1993	Germany	841
Cereal	Wheat starch	µg/kg			1.3	9	1995	Germany	313
Cereal	Wheat starch	µg/kg			16		1995	Germany	313
Cereal	Wheatflour	µg/kg			78	1	1992	Morocco	314
Cereal	Macaroni	µg/kg			4.4	9	1995	Germany	313
Cereal	Macaroni	µg/kg			50		1995	Germany	313
Cereal	Noodles	µg/kg			3.8	9	1995	Germany	313
Cereal	Noodles	µg/kg			43		1995	Germany	313
Dairy	Butter	µg/kg			1.3	9	1995	Germany	313
Dairy	Butter	µg/kg			28		1995	Germany	313

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Dairy	Butter	µg/kg			56		1952	World	486
Dairy	Butter	µg/kg			36		1993	Germany	841
Dairy	Soft cheese	µg/kg			5.1	9	1995	Germany	313
Dairy	Soft cheese	µg/kg			125		1995	Germany	313
Dairy	Camembert cheese	µg/kg			3.5	9	1995	Germany	313
Dairy	Camembert cheese	µg/kg			76		1995	Germany	313
Dairy	Cheese	µg/kg	60	164	121	24	1999	Demark	372
Dairy	Cheese	µg/kg			51		1952	World	486
Dairy	Cheese	µg/kg			259		1993	Germany	841
Dairy	Gouda cheese	µg/kg			3.6	9	1995	Germany	313
Dairy	Gouda cheese	µg/kg			66		1995	Germany	313
Dairy	Limburger cheese	µg/kg			6.1	9	1995	Germany	313
Dairy	Limburger cheese	µg/kg			132		1995	Germany	313
Dairy	Commercial Full Cream Milk	µg/l	60	94	72	3	1992	Morocco	314
Dairy	Commercial Skimmed Milk	µg/l	64	50	58	3	1992	Morocco	314
Dairy	Cows colostrum	µg/l	200	350		5	1953	World	657
Dairy	Cows milk	µg/kg	42	162	101	24	1999	Demark	372
Dairy	Cows milk	µg/kg			35		1952	World	486
Dairy	Cows milk	µg/kg			123	10	1992	India	771
Dairy	Cows milk	µg/kg			291		1995	UK	772
Dairy	Cows milk	µg/kg	190	440	300		1996	UK	773
Dairy	Cows milk	µg/kg	23	104			1965	UK	775
Dairy	Cows milk	µg/kg	30	280			1985	UK	775
Dairy	Cows milk	µg/kg			180		1980	UK	777
Dairy	Cows milk	µg/kg	40	310	150	52	1990 - 1991	UK	778
Dairy	Cows milk	µg/kg			150		1985	UK	779
Dairy	Cows milk	µg/kg			738		1993	Germany	841
Dairy	Cows milk	µg/kg			311	220	1999	UK	931
Dairy	Cows milk	µg/kg			170		1991	UK	1086
Dairy	Cows milk	µg/kg			300		1995	UK	1086
Dairy	Cows milk	µg/kg			310		1999	UK	1086
Dairy	Cows milk	µg/kg			320	400	1997	UK	1086
Dairy	Cows milk	µg/l	15	33	24	4	1992	Morocco	314
Dairy	Cows milk	µg/l	8.4	27.4	17.4		1993	Austria/ Germany	321
Dairy	Cows milk	µg/l			152	2	1975	World	657
Dairy	Cows milk	µg/l	20	70			1934	World	657
Dairy	Cows milk	µg/l	510	1070			1934	World	657
Dairy	Cows milk	µg/l	72	136		5	1953	World	657
Dairy	Cows milk	µg/l	89	94		2	1975	World	657
Dairy	Cows milk	µg/l			41.5		1970	Greece	748
Dairy	Cows milk	µg/l	35	4000	100		1993	World	748
Dairy	Cows milk	µg/l	360	1320			1978	USA	748
Dairy	Cows milk	µg/l	113	197			1985	UK	748
Dairy	Cows milk	µg/l	20	1320			1974-1978	USA	801
Dairy	Cows milk	µg/l	63	1610			1972	USA	807
Dairy	Cows milk	µg/l			380		1993	Canada	838
Dairy	Cows milk	µg/l		1000			1970 - 1980	Australia	839
Dairy	Cows milk	µg/l			17		1985	Germany	841
Dairy	Cows milk	µg/l			53		1987	Germany	841
Dairy	Cows milk	µg/l			81		1989	Germany	841
Dairy	Cows milk	µg/l	130	200			1988	UK	847
Dairy	Cows milk	µg/l			22		1960 - 1997	Poland	1097
Dairy	Cows milk	µg/l	205	757			1998	Poland	1097
Dairy	Cow's milk	µg/l	60	10			1930	New Zealand	726
Dairy	Cream	µg/kg	100	217	110	24	1999	Demark	372
Dairy	Curd	µg/kg			6.2	9	1995	Germany	313

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Dairy	Curd	µg/kg			328		1995	Germany	313
Dairy	Full Cream	µg/l	6	10	8	6	1992	Morocco	314
Dairy	Milk and milk products	µg/kg			47		1952	World	486
Dairy	Milk powder	µg/kg			1420		1980	UK	777
Dairy	Milks and creams	µg/kg	10.8	613		400	1999	UK	774
Dairy	Whey -milk	µg/l			13		1993	Austria/ Germany	321
Dairy	Goats milk	µg/l			5.1		1993	Germany	841
Dairy	Goats milk	µg/l			27		1993	Germany	841
Dairy	Goats milk	µg/l			34		1993	Germany	841
Dairy	Goats milk	µg/l			111		1993	Germany	841
Dairy	Goats milk	µg/l			225		1993	Germany	841
Dairy	Goats milk	µg/l			1181		1993	Germany	841
Dairy	Dairy products	µg/kg			151		1995	UK	772
Dairy	Dairy products	µg/kg			130	18	1964	World	830
Dairy	Dairy products	µg/kg			420	400	1997	UK	1086
Dairy	Dairy products and eggs	µg/kg			340		1990-1991	UK	779
Dairy	Dairy products and eggs	µg/kg			370		1985	UK	779
Dairy	Eggs	µg/egg			13.4		1970	Greece	748
Dairy	Eggs	µg/egg		170			1970	USA	748
Dairy	Eggs	µg/egg	18.3	187			1998	Poland	1097
Dairy	Eggs	µg/kg	30	210			1992-1995	China	194
Dairy	Eggs	µg/kg			4.4	9	1995	Germany	313
Dairy	Eggs	µg/kg			177		1995	Germany	313
Dairy	Eggs	µg/kg	2303	23 592		11	1998	Czech	365
Dairy	Eggs	µg/kg			93		1952	World	486
Dairy	Eggs	µg/kg			507	3	1992	India	771
Dairy	Eggs	µg/kg			505		1995	UK	772
Dairy	Eggs	µg/kg			550		1980	UK	777
Dairy	Eggs	µg/kg			260	11	1964	World	830
Dairy	Eggs	µg/kg			292		1993	Germany	841
Dairy	Eggs	µg/kg	870	4767			1999	Czech	879
Dairy	Eggs	µg/kg			480	400	1997	UK	1086
Dairy	Eggs	µg/kg			920		1997	China	1086
Fish	Salmon oils	µg/kg			2450		1952	World	486
Fish	Fish oil	µg/kg			4360		1952	World	486
Fish	Cod liver oil	µg/kg			8387		1952	World	486
Fish	Other fish oils	µg/kg			3052		1952	World	486
Fish	Carp	µg/kg			68		1952	World	486
Fish	Freshwater fish	µg/kg			116		1952	World	486
Fish	Freshwater fish	µg/kg			30		1970	?	748
Fish	Freshwater fish	µg/kg			790	3	1992	India	771
Fish	Lake trout	µg/kg			88		1952	World	486
Fish	River bass	µg/kg			115		1952	World	486
Fish	River perch	µg/kg			194		1952	World	486
Fish	Trout	µg/kg			11.7	9	1995	Germany	313
Fish	Trout	µg/kg			404		1995	Germany	313
Fish	Trout	µg/kg			76		1993	Germany	841
Fish	Anadromous fish	µg/kg			1029		1952	World	486
Fish	Clams	µg/kg			3595		1952	World	486
Fish	Cod	µg/kg			7493		1952	World	486
Fish	Crab	µg/kg			1292		1952	World	486
Fish	Fish	µg/kg			64		1970	Greece	748
Fish	Fish	µg/kg			1445		1995	UK	772
Fish	Fish	µg/kg			1120		1990-1991	UK	779
Fish	Fish	µg/kg			1270		1985	UK	779
Fish	Fish	µg/kg	110	3280			1990 - 1991	UK	779

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Fish	Fish	µg/kg			780	31	1994	UK	1086
Fish	Fish	µg/kg			1300	400	1997	UK	1086
Fish	Haddock	µg/kg			15941		1952	World	486
Fish	Haddock	µg/kg			1240		1980	UK	777
Fish	Halibut	µg/kg			2225		1952	World	486
Fish	Herring	µg/kg			63.6	9	1995	Germany	313
Fish	Herring	µg/kg			2113		1995	Germany	313
Fish	Herring	µg/kg			1358		1952	World	486
Fish	Herring	µg/kg			1280		1993	Germany	841
Fish	Lobster	µg/kg			4744		1952	World	486
Fish	Mackerel	µg/kg			81.8	9	1995	Germany	313
Fish	Mackerel	µg/kg			2067		1995	Germany	313
Fish	Mackerel	µg/kg			1031		1952	World	486
Fish	Marine fish	µg/kg			3715		1952	World	486
Fish	Marine fish	µg/kg			832		1970	?	748
Fish	Marine fish	µg/kg		1200			1991	UK	775
Fish	Marine prawns	µg/kg			113	5	1992	India	771
Fish	Oysters	µg/kg			4712		1952	World	486
Fish	Red fish paste	µg/kg			8000		1982 - 1984	Japan	1098
Fish	Salmon	µg/kg			1030		1952	World	486
Fish	Sardines	µg/kg			745		1952	World	486
Fish	Sea bass	µg/kg			471		1952	World	486
Fish	Sea perch	µg/kg			3105		1952	World	486
Fish	Sea trout	µg/kg			1028		1952	World	486
Fish	Seafood	µg/kg			660	7	1964	World	830
Fish	Shell fish	µg/kg			3866		1952	World	486
Fish	Shrimps	µg/kg			4987		1952	World	486
Fish	Sole	µg/kg			1072		1952	World	486
Fruit	Apple	µg/kg			0.2	9	1995	Germany	313
Fruit	Apple	µg/kg			19		1995	Germany	313
Fruit	Apple	µg/kg			277		1952	World	486
Fruit	Apple	µg/kg			53	3	1992	India	771
Fruit	Cranberries	µg/kg			100		1952	World	486
Fruit	Fresh fruit	µg/kg			40	400	1997	UK	1086
Fruit	Fresh fruit and products	µg/kg			50		1990-1991	UK	779
Fruit	Fresh fruit and products	µg/kg			90		1985	UK	779
Fruit	Fruit	µg/kg			40		1995	UK	772
Fruit	Fruit products	µg/kg			54		1995	UK	772
Fruit	Fruit products	µg/kg			90	400	1997	UK	1086
Fruit	Fruits	µg/kg			159		1952	World	486
Fruit	Fruits	µg/kg			40	18	1964	World	830
Fruit	Grapes	µg/kg			96	3	1992	India	771
Fruit	Lemon	µg/kg			1.9	9	1995	Germany	313
Fruit	Lemon	µg/kg			163		1995	Germany	313
Fruit	Orange	µg/kg			0.3	9	1995	Germany	313
Fruit	Orange	µg/kg			25		1995	Germany	313
Fruit	Pears	µg/kg			62		1952	World	486
Fruit	Canned cherries	µg/kg			113000		1982 - 1984	Japan	1098
Human Milk	Breast milk	µg/l	10	55	27	14	1992	Morocco	314
Human Milk	Breast milk	µg/l	16	78	40	5	1992	Morocco	314
Human Milk	Breast milk	µg/l	1800	5400		5	1997	Reunion Island	356
Human Milk	Breast milk	µg/l	40	80			1950	World	657
Human Milk	Breast milk	µg/l			120		1993	Germany	834
Human milk	Breast milk	µg/l			270		1993	Italy	834
Human Milk	Breast milk	µg/l			950		1993	France	834
Human Milk	Breast milk	µg/l			1780		1993	USA	834

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Human Milk	Breast milk	µg/l			14		1982	Germany	841
Human Milk	Breast milk	µg/l			19		1987	Germany	841
Human Milk	Breast milk	µg/l			36		1991	Germany	841
Human Milk	Human colostrum	µg/l	50	240			1950	World	657
Human Milk	Breast milk	µg/l	892	2170		50	1999	Korea	884
Medical	Iodinated glycerol	µg/tablet			15000		1991	Developed countries	748
Medical	Isopropamide iodine	µg/tablet			1800		1991	Developed countries	748
Mineral Supplement	Mineral tablets	µg/tablet	100	150			1991	USA	748
Mineral Supplement	Mineral tablets	µg/tablet	100	500			1993	Germany	748
Meat	Bacon	µg/kg			77		1952	World	486
Meat	Beef	µg/kg			28		1952	World	486
Meat	Beef	µg/kg			187		1993	Germany	841
Meat	Blood sausage	µg/kg			3.9	9	1995	Germany	313
Meat	Blood sausage	µg/kg			77		1995	Germany	313
Meat	Blood sausage	µg/kg			218		1993	Germany	841
Meat	Bockwurst	µg/kg			43.8	9	1995	Germany	313
Meat	Bockwurst	µg/kg			976		1995	Germany	313
Meat	Bockwurst	µg/kg			630		1993	Germany	841
Meat	Carcass	µg/kg			50		1995	UK	772
Meat	Carcass	µg/kg			90	400	1997	UK	1086
Meat	Chicken	µg/kg	50	230			1992-1995	China	194
Meat	Lard	µg/kg			97		1952	World	486
Meat	Liver sausage	µg/kg			4.7	9	1995	Germany	313
Meat	Liver sausage	µg/kg			91		1995	Germany	313
Meat	Meat	µg/kg	1.6	260			1980	USA	748
Meat	Meat	µg/kg			850		1991	UK	1086
Meat	Meat and meat products	µg/kg			50		1952	World	486
Meat	Meat products	µg/kg			202		1995	UK	772
Meat	Meat products	µg/kg			1510		1985	UK	779
Meat	Meat products	µg/kg	50	180			1990 - 1991	UK	779
Meat	Meat products	µg/kg			260	12	1964	World	830
Meat	Meat products	µg/kg			130	400	1997	UK	1086
Meat	Mutton	µg/kg	60	360			1992-1995	China	194
Meat	Mutton	µg/kg			3.4	9	1995	Germany	313
Meat	Mutton	µg/kg			102		1995	Germany	313
Meat	Mutton	µg/kg			27		1952	World	486
Meat	Offal	µg/kg			92		1995	UK	772
Meat	Offal	µg/kg			90	400	1997	UK	1086
Meat	Pork	µg/kg			4.4	9	1995	Germany	313
Meat	Pork	µg/kg			159		1995	Germany	313
Meat	Pork	µg/kg			45		1952	World	486
Meat	Pork	µg/kg			159		1993	Germany	841
Meat	Pork sausage	µg/kg			134		1993	Germany	841
Meat	Poultry	µg/kg			7.7	9	1995	Germany	313
Meat	Poultry	µg/kg			274		1995	Germany	313
Meat	Poultry	µg/kg			58		1995	UK	772
Meat	Poultry	µg/kg			100	400	1997	UK	1086
Meat	Salami	µg/kg			3	9	1995	Germany	313
Meat	Salami	µg/kg			54		1995	Germany	313
Meat	Veal	µg/kg			28		1952	World	486
Meat	Vienna sausage	µg/kg	3200	45000			1982 - 1984	Japan	1098
Meat, eggs, milk	Meat, eggs, milk	µg/kg			33	90	1992	China	267
Nuts	Nuts	µg/kg			40		1995	UK	772
Nuts	Nuts	µg/kg	90	210			1990 - 1991	UK	779
Nuts	Nuts	µg/kg			66		1991	UK	1086
Nuts	Nuts	µg/kg			150		1994	UK	1086

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Nuts	Nuts	µg/kg			250	400	1997	UK	1086
Oils and Fats	Oils and Fats	µg/kg			44		1995	UK	772
Oils and Fats	Oils and Fats	µg/kg			130		1985	UK	779
Oils and Fats	Oils and Fats	µg/kg			280		1990-1991	UK	779
Oils and Fats	Oils and Fats	µg/kg			220	400	1997	UK	1086
Oils and Fats	Margarine	µg/kg			0.7	9	1995	Germany	313
Oils and Fats	Margarine	µg/kg			9.4		1995	Germany	313
Salt	Iodised salt	µg/kg			15000		1992	India	326
Salt	Iodised salt	µg/kg			21480	10	1993	India	326
Salt	Iodised salt	µg/kg			30000		1992	India	326
Salt	Iodised salt	µg/kg	7050	73800	39810	10	1993	India	326
Salt	Iodised salt	µg/kg	47000	52000		30	1992	India	326
Salt	Iodised salt	µg/kg	50000	55000		30	1993	India	326
Salt	Iodised salt	µg/kg			47100	60	1996	Malaysia	341
Salt	Iodised salt	µg/kg			3800	1	1997	Reunion Island	356
Salt	Iodised salt	µg/kg			76000		1993	Canada	838
Salt	Iodised salt	µg/kg	25000	40000			1993	Australia	839
Salt	Iodised salt	µg/kg			3750		1922	Switzerland	872
Salt	Iodised salt	µg/kg			7500		1962	Switzerland	872
Salt	Iodised salt	µg/kg			15000		1980	Switzerland	872
Salt	Iodised salt	µg/kg			25000		1999	Switzerland	872
Salt	Iodised salt	µg/kg	140	12000	5120	3	2002	Morocco	1142
Salt	Iodised salt	µg/l			1060	3	1993	India	326
Salt	Iodised salt	µg/l			1140	3	1993	India	326
Salt	Iodised salt	µg/l	1160	1230	1190	3	1993	India	326
Salt	Iodised salt	µg/l			26700	3	1993	India	326
Salt	Iodised salt	µg/l			28920	3	1993	India	326
Salt	Iodised salt	µg/l	28960	31620	30170	3	1993	India	326
Salt	Rock salt	µg/kg	420	570	495	4	1992	Morocco	314
Salt	Rock salt	µg/kg	460	600	538	4	1992	Morocco	314
Salt	Rock salt	µg/kg	300	300	300	2	2003	China	1141
Salt	Salt	µg/kg	82.6	344		11	1992	Togo	284
Salt	Salt	µg/kg			800	60	1996	Malaysia	341
Salt	Commercial sea salt	µg/kg	90	160	128	4	1992	Morocco	314
Salt	Cooking salt	µg/kg			220.6	9	1995	Germany	313
Salt	Cooking salt	µg/kg			2206		1995	Germany	313
Salt	Cooking salt	µg/kg			200		1994	Togo	316
Salt	Cooking salt	µg/kg			11200		1994	France	316
Seaweed	Seaweed	µg/kg	400	600			1950	Japan	657
Seaweed	Seaweed	µg/kg		5000			1991	UK	775
Seaweed	Seaweed	µg/kg	4300	2660000			1990 - 1991	UK	779
Seaweed	Seaweed	µg/kg	100000	4500000			1993	Japan	840
Sweet	Biscuits	µg/kg	30	110			1990 - 1991	UK	779
Sweet	Chocolate	µg/kg			6.5	9	1995	Germany	313
Sweet	Chocolate	µg/kg			70		1995	Germany	313
Sweet	Chocolate candies	µg/kg			5.8	9	1995	Germany	313
Sweet	Chocolate candies	µg/kg			63		1995	Germany	313
Sweet	Chocolate pudding	µg/kg			1.4	9	1995	Germany	313
Sweet	Chocolate pudding	µg/kg			15		1995	Germany	313
Sweet	Cocoa	µg/kg			4.6	9	1995	Germany	313
Sweet	Cocoa	µg/kg			52		1995	Germany	313
Sweet	Honey	µg/kg			2.6	9	1995	Germany	313
Sweet	Honey	µg/kg			35		1995	Germany	313
Sweet	Jam	µg/kg			3.2	9	1995	Germany	313
Sweet	Jam	µg/kg			56		1995	Germany	313
Sweet	Raw vs. refined sugar	µg/kg	1	30			1951	World	657

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Sweet	Semolina	µg/kg			3.4	9	1995	Germany	313
Sweet	Semolina	µg/kg			38		1995	Germany	313
Sweet	Sugar	µg/kg			76		1995	Germany	313
Sweet	Sugar	µg/kg			80	9	1995	Germany	313
Sweet	Sugar and Preserves	µg/kg			176		1995	UK	772
Sweet	Sugar and Preserves	µg/kg			150		1990-1991	UK	779
Sweet	Sugar and Preserves	µg/kg			410		1985	UK	779
Sweet	Sugar and Preserves	µg/kg			270	400	1997	UK	1086
Sweet	Vanilla pudding	µg/kg			1.8	9	1995	Germany	313
Sweet	Vanilla pudding	µg/kg			21		1995	Germany	313
Vegetable	Bean edible pods and seed	µg/kg	29	1500		32	1972	USA	654
Vegetable	Bean seed	µg/kg	21	83		15	1972	USA	654
Vegetable	Beans	µg/kg			245		1952	World	486
Vegetable	Field beans	µg/kg			201	248	1998	India	374
Vegetable	Field beans	µg/kg	480	560	520	6	1998	India	374
Vegetable	French beans	µg/kg			0.3	9	1995	Germany	313
Vegetable	French beans	µg/kg			40		1995	Germany	313
Vegetable	Peas	µg/kg			223		1952	World	486
Vegetable	Peas/beans	µg/kg			234		1952	World	486
Vegetable	Peeled peas	µg/kg			2.1	9	1995	Germany	313
Vegetable	Peeled peas	µg/kg			25		1995	Germany	313
Vegetable	Black gram	µg/kg			148	248	1998	India	374
Vegetable	Black gram	µg/kg	460	480	470	6	1998	India	374
Vegetable	Green gram	µg/kg			118	248	1998	India	374
Vegetable	Green gram	µg/kg	230	260	250	6	1998	India	374
Vegetable	Red gram	µg/kg			196	248	1998	India	374
Vegetable	Red gram	µg/kg	260	300	280	6	1998	India	374
Vegetable	Cowpea	µg/kg			163	248	1998	India	374
Vegetable	Cowpea	µg/kg	360	420	390	6	1998	India	374
Vegetable	Rice beans	µg/kg			91	248	1998	India	374
Vegetable	Runner bean	µg/kg	10	12	9	4	2003	Morocco	1142
Vegetable	Soya beans	µg/kg			176	248	1998	India	374
Vegetable	Soya beans	µg/kg	450	530	490	6	1998	India	374
Vegetable	String beans	µg/kg	29	429			1929	USA	560
Vegetable	White beans	µg/kg			1.8	9	1995	Germany	313
Vegetable	White beans	µg/kg			21		1995	Germany	313
Vegetable	Asparagus	µg/kg			1102		1952	World	486
Vegetable	Asparagus	µg/kg	12	285			1929	USA	560
Vegetable	Asparagus	µg/kg	12	3780		7	1972	USA	654
Vegetable	Paprika sweet	µg/kg			6.8	9	1995	Germany	313
Vegetable	Paprika sweet	µg/kg			79		1995	Germany	313
Vegetable	Red chillies	µg/kg			141	26	1998	India	374
Vegetable	Red chillies	µg/kg			380	3	1998	India	374
Vegetable	Red chillies	µg/kg			400	5	1992	India	771
Vegetable	Tomato	µg/kg			1.4	9	1995	Germany	313
Vegetable	Tomato	µg/kg			31		1995	Germany	313
Vegetable	Tomato	µg/kg			196		1952	World	486
Vegetable	Tomato	µg/kg	20	660		22	1972	USA	654
Vegetable	Tomato	µg/kg			15	3	1992	India	771
Vegetable	Tomato	µg/kg			82		1993	Germany	841
Vegetable	Cucumber	µg/kg			0.2	9	1995	Germany	313
Vegetable	Cucumber	µg/kg			43		1995	Germany	313
Vegetable	Cucumber	µg/kg			400		1952	World	486
Vegetable	Cucumber	µg/kg	44	940		8	1972	USA	654
Vegetable	Cucumber	µg/kg			336		1993	Germany	841
Vegetable	Beetroot	µg/kg			233		1952	World	486

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Vegetable	Beetroot	µg/kg	8	227			1929	USA	560
Vegetable	Beetroot	µg/kg			167	3	1992	India	771
Vegetable	Beet leaf	µg/kg			383	47	1993	Germany	841
Vegetable	Beet leaf	µg/l			196	18	1993	Germany	841
Vegetable	Beets leaves	µg/kg	248	1435		8	1972	USA	654
Vegetable	Beets, roots	µg/kg	8	416		18	1972	USA	654
Vegetable	Mangolds (beetroot)	µg/kg			192		1952	World	486
Vegetable	Carrots	µg/kg	18	31	25	7	2003	Morocco	1142
Vegetable	Carrots	µg/kg			202		1952	World	486
Vegetable	Carrots	µg/kg	2.3	197			1929	USA	560
Vegetable	Carrots	µg/kg	2	2400		35	1972	USA	654
Vegetable	Onions	µg/kg	46	479		23	1972	USA	654
Vegetable	Onions	µg/kg			204		1952	World	486
Vegetable	Turnip	µg/kg			223		1929	USA	560
Vegetable	Turnip tops	µg/kg			433		1929	USA	560
Vegetable	Turnip, leaves	µg/kg	111	676		22	1972	USA	654
Vegetable	Turnip, root	µg/kg	223	870		4	1972	USA	654
Vegetable	Turnip, whole plant	µg/kg	740	2080		5	1972	USA	654
Vegetable	Turnips	µg/kg			343		1952	World	486
Vegetable	Sweet Potato	µg/kg			74	18	1998	India	374
Vegetable	Sweet Potato	µg/kg			170	17	1998	India	374
Vegetable	Sweet Potato	µg/kg			98		1929	USA	560
Vegetable	Potatoes	µg/kg			0.5	9	1995	Germany	313
Vegetable	Potatoes	µg/kg			31		1995	Germany	313
Vegetable	Potatoes	µg/kg			197		1952	World	486
Vegetable	Potatoes	µg/kg	26	283		92	1929	USA	560
Vegetable	Potatoes	µg/kg	7	446		360	1972	USA	654
Vegetable	Potatoes	µg/kg			19	3	1992	India	771
Vegetable	Potatoes	µg/kg			79		1995	UK	772
Vegetable	Potatoes	µg/kg			23		1993	Germany	841
Vegetable	Potatoes	µg/kg			82	8	1993	Germany	841
Vegetable	Potatoes	µg/kg			70	400	1997	UK	1086
Vegetable	Potatoes	µg/kg			480		1997	China	1086
Vegetable	Potatoes	µg/kg			10	1	2003	Morocco	1142
Vegetable	Cabbage	µg/kg	70	240			1992-1995	China	194
Vegetable	Cabbage	µg/kg			260		1952	World	486
Vegetable	Cabbage	µg/kg			336		1929	USA	560
Vegetable	Cabbage	µg/kg	16	791		85	1972	USA	654
Vegetable	Cabbage	µg/kg	0	95000			1972	World	657
Vegetable	Cabbage	µg/kg	35.5	234.6	113.2	44	2003	China	1141
Vegetable	Kohlrabi	µg/kg			49		1995	Germany	313
Vegetable	Kohlrabi	µg/kg			0.4	9	1995	Germany	313
Vegetable	White cabbage	µg/kg			0.9	9	1995	Germany	313
Vegetable	White cabbage	µg/kg			87		1995	Germany	313
Vegetable	White cabbage	µg/kg			90	6	1993	Germany	841
Vegetable	White cabbage	µg/kg			171		1993	Germany	841
Vegetable	Lettuce	µg/kg			1.7	9	1995	Germany	313
Vegetable	Lettuce	µg/kg			237		1995	Germany	313
Vegetable	Lettuce	µg/kg			668		1952	World	486
Vegetable	Lettuce	µg/kg			761		1929	USA	560
Vegetable	Lettuce	µg/kg	71	6740		41	1972	USA	654
Vegetable	Lettuce	µg/kg			610		1993	Germany	841
Vegetable	Cauliflower	µg/kg			221		1952	World	486
Vegetable	Cauliflower	µg/kg			125		1993	Germany	841
Vegetable	Spinach	µg/kg			1636		1952	World	486
Vegetable	Spinach	µg/kg	19.5	694			1929	USA	560

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Vegetable	Spinach	µg/kg	19	48650		35	1972	USA	654
Vegetable	Canned vegetables	µg/kg			40		1995	UK	772
Vegetable	Canned vegetables	µg/kg			20		1990-1991	UK	779
Vegetable	Canned vegetables	µg/kg			30		1985	UK	779
Vegetable	Canned vegetables	µg/kg			40	400	1997	UK	1086
Vegetable	Ready -to-serve soup	µg/kg			3.5	9	1995	Germany	313
Vegetable	Ready -to-serve soup	µg/kg			39		1995	Germany	313
Yeasts and Stocks	Yeast and vegetable extract	µg/kg	180	260			1990 - 1991	UK	779
Herbs and Spices	Caraway	µg/kg			11.7	9	1995	Germany	313
Herbs and Spices	Caraway	µg/kg			129		1995	Germany	313
Herbs and Spices	Chive	µg/kg			2	9	1995	Germany	313
Herbs and Spices	Chive	µg/kg			192		1995	Germany	313
Herbs and Spices	Cinnamon	µg/kg			15.6	9	1995	Germany	313
Herbs and Spices	Cinnamon	µg/kg			182		1995	Germany	313
Herbs and Spices	Clove	µg/kg			61	4	1992	India	771
Herbs and Spices	Dill	µg/kg			3.9	9	1995	Germany	313
Herbs and Spices	Dill	µg/kg			388		1995	Germany	313
Herbs and Spices	Garlic	µg/kg			66	26	1998	India	374
Herbs and Spices	Garlic	µg/kg			120	2	1998	India	374
Herbs and Spices	Ginger	µg/kg			135	26	1998	India	374
Herbs and Spices	Ginger	µg/kg			560	2	1998	India	374
Herbs and Spices	Colocassia	µg/kg			54	18	1998	India	374
Herbs and Spices	Marjoram	µg/kg			58.8	9	1995	Germany	313
Herbs and Spices	Marjoram	µg/kg			678		1995	Germany	313
Herbs and Spices	Mint leaves	µg/kg			87	3	1992	India	771
Herbs and Spices	Mustard seeds	µg/kg			3.8	9	1995	Germany	313
Herbs and Spices	Mustard seeds	µg/kg			40		1995	Germany	313
Herbs and Spices	White mustard	µg/kg			506	5	1992	India	771
Herbs and Spices	Parsley	µg/kg			3.2	9	1995	Germany	313
Herbs and Spices	Parsley	µg/kg			180		1995	Germany	313
Herbs and Spices	Pepper	µg/kg			13.5	9	1995	Germany	313
Herbs and Spices	Pepper	µg/kg			157		1995	Germany	313
Herbs and Spices	Pepper	µg/kg			356	3	1992	India	771
Vegetable	Cassava	µg/kg			71	18	1998	India	374
Vegetable	Summer squash	µg/kg			716		1929	USA	560
Vegetable	Gourds	µg/kg			600		1952	World	486
Vegetable	Ground nut	µg/kg			553	3	1992	India	771
Vegetable	Ladies finger	µg/kg			45	3	1992	India	771
Vegetable	Amaranth leaves	µg/kg			163	3	1992	India	771
Vegetable	Green vegetables	µg/kg			40		1995	UK	772
Vegetable	Green vegetables	µg/kg			30	400	1997	UK	1086
Vegetable	Other vegetables	µg/kg			40		1995	UK	772
Vegetable	Other vegetables	µg/kg			40	400	1997	UK	1086
Vegetable	Other vegetables and nuts	µg/kg			10		1990-1991	UK	779
Vegetable	Other vegetables and nuts	µg/kg			30		1985	UK	779
Vegetable	Vegetables	µg/kg			66	28	1992	China	267
Vegetable	Vegetables	µg/kg			120	21	1992	China	267
Vegetable	Vegetables	µg/kg			206	20	1993	China	267
Vegetable	Vegetables	µg/kg			385		1952	World	486
Vegetable	Vegetables	µg/kg			320	13	1964	World	830
Water	Drinking water	µg/l			50		1998	Egypt	184
Water	Drinking water	µg/l	1	1.5			1992-1995	China	194
Water	Drinking water	µg/l	7	85		3	1992-1995	China	194
Water	Drinking water	µg/l	0.65	35.9			1995	Japan	249
Water	Drinking water	µg/l	1	9.2		10	1992	Togo	284
Water	Drinking water	µg/l			0.92	1	1992	Morocco	314

Classification	Item	Units	Min	Max	Average	No	Year	Country	Reference
Water	Drinking water	µg/l			1.08	1	1992	Morocco	314
Water	Drinking water	µg/l	1.08	1.3	1.19	2	1992	Morocco	314
Water	Drinking water	µg/l			2		1994	Togo	316
Water	Drinking water	µg/l			500		1985	Jamaica	322
Water	Drinking water	µg/l			0		1996	Malaysia	341
Water	Drinking water	µg/l			138.6	24	1996	Malaysia	341
Water	Drinking water	µg/l	6	1300		3	1997	Reunion Island	356
Water	Drinking water	µg/l	2	8			1999	Demark	372
Water	Drinking water	µg/l	10	30			1999	Demark	372
Water	Drinking water	µg/l	3	31.5	7.38	287	1998	India	374
Water	Drinking water	µg/l	5	63.7	36.5	50	1998	India	374
Water	Drinking water	µg/l	0.1	139		55	1999	Denmark	395
Water	Drinking water	µg/l	0.76	3.01	1.52	108	1999	India	412
Water	Drinking water	µg/l	1.6	1270			1986	World	451
Water	Drinking water	µg/l			3.1	1	1963	New Zealand	496
Water	Drinking water	µg/l	0.7	14.8		10	1963	New Zealand	496
Water	Drinking water	µg/l	1.1	10.8		11	1963	New Zealand	496
Water	Drinking water	µg/l	0.8	9		13	1963	New Zealand	496
Water	Drinking water	µg/l	1.4	450	48.76	241	1992	Sri Lanka	600
Water	Drinking water	µg/l	15	150	55	60	1993	Sri Lanka	605
Water	Drinking water	µg/l	11.9	119.03		609	1996	Sri Lanka	606
Water	Drinking water	µg/l			0.1	1	1989	Canada	612
Water	Drinking water	µg/l	1.3	3.73	1.82	9	1989	UK	612
Water	Drinking water	µg/l	0.5	3.8	1.89	9	1989	UK	612
Water	Drinking water	µg/l	1.95	11.9	5.52	7	1989	UK	612
Water	Drinking water	µg/l			6.42	1	1989	USA	612
Water	Drinking water	µg/l			7.68	1	1989	USA	612
Water	Drinking water	µg/l	44	100			1968	Egypt	612
Water	Drinking water	µg/l	7	18			1968	Egypt	612
Water	Drinking water	µg/l	3	5			1923	World	662
Water	Drinking water	µg/l		1			Pre 1971	Australia	839
Water	Drinking water	µg/l	0.9	9			1993	Germany	841
Water	Drinking water	µg/l	5	50			1989	China	1082
Water	Drinking water	µg/l	3	84	28.05	15	1998	Sri Lanka	1088
Water	Drinking water	µg/l	0.01	70			1996	World	1094
Water	Drinking water	µg/l	0.05	1		84	1994	India	1099
Water	Drinking water	µg/l	0.1	4.05	2.32	10	2003	China	1141
Water	Drinking water	µg/l	78	100	88.65	5	2003	China	1141
Water	Drinking water	µg/l	1.6	2.8	0.52	11	2003	Morocco	1142
Water	Drinking water	µg/l	17.8	35.2	3.1	8	2003	Morocco	1142
Water	Water purification tablets	µg/l			8000		1993	USA	748
Fodder	Grass	µg/kg			104	106	1993	Germany	841
Fodder	Grass	µg/l			59	24	1993	Germany	841
Fodder	Red clover	µg/kg			58	6	1993	Germany	841
Fodder	Red clover	µg/kg			111	12	1993	Germany	841

Appendix 3 : Listing of dietary iodine intake sub-database

The reference number (ref) refers to the citation in which the result is quoted. These are listed in citation number order in the list of references at the end of this report.

Classification	Item	Units	Min	Max	Average	Number	Year	Country	Reference
Average Daily Intake	< 1 year	µg/day	100				1990	USA/ Europe	329
Average Daily Intake	1 - 10 years	µg/day	60	100			1990	USA/ Europe	329
Average Daily Intake	10+ years	µg/day	35	40			1990	USA/ Europe	329
Average Daily Intake	Adult	µg/day	50	100			1999	Demark	372
Average Daily Intake	Adult	µg/day	35	45			1999	Germany	402
Average Daily Intake	English adult	µg/day			220		1951	UK	657
Average Daily Intake	USA adult	µg/day	238	738			1970	USA	657
Average Daily Intake	Goitre occurs	µg/day			50		1972	World	657
Average Daily Intake	Japanese adult	µg/day			300		1974	Japan	657
Average Daily Intake	Cretinism occurs	µg/day			20		1986	India/ China	657
Average Daily Intake	Goitre Areas	µg/day			100		1986	World	657
Average Daily Intake	Adults	µg/day			696		1978	USA	748
Average Daily Intake	Infants	µg/day			576		1978	USA	748
Average Daily Intake	Toddlers	µg/day			728		1978	USA	748
Average Daily Intake	1 Home	µg/day	45	1921			1986	Japan	748
Average Daily Intake	1 - 2 years	µg/day			180		1982 - 1989	USA	748
Average Daily Intake	14 - 16 years female	µg/day			340		1982 - 1989	USA	748
Average Daily Intake	2 years	µg/day			280		1982 - 1989	USA	748
Average Daily Intake	30 - 35 years female	µg/day			260		1982 - 1989	USA	748
Average Daily Intake	Teenage males	µg/day			550		1982 - 1989	USA	748
Average Daily Intake	Adult	µg/day	151	209			1995	UK	772
Average Daily Intake	Children	µg/day	140	710			1984	USA	775
Average Daily Intake	Adult	µg/day	176	243	255		1990	UK	775
Average Daily Intake	Adult	µg/day			173		1985	UK	779
Average Daily Intake	Adult	µg/day			1046		1987	Canada	779
Average Daily Intake	Adult	µg/day			402		1989	Netherlands	779
Average Daily Intake	Adult	µg/day	260	410			1989	USA	779
Average Daily Intake	Adult	µg/day			16		1992	Germany	779
Average Daily Intake	Adult	µg/day			250		1992	Finland	779
Average Daily Intake	Adult	µg/day			166		1990-1991	UK	779
Average Daily Intake	Nationwide Females	µg/day			190	377	1989	UK	798
Average Daily Intake	Nationwide Males	µg/day			244	386	1989	UK	798
Average Daily Intake	Demi-vegetarian Females	µg/day			172	24	1992	UK	798
Average Daily Intake	Demi-vegetarian Males	µg/day			253	13	1992	UK	798
Average Daily Intake	Lacto-ovo-vegetarian F	µg/day			167	36	1992	UK	798
Average Daily Intake	Lacto-ovo-vegetarian M	µg/day			216	16	1992	UK	798
Average Daily Intake	Vegan Females	µg/day			66	20	1992	UK	798
Average Daily Intake	Vegan Males	µg/day			98	18	1992	UK	798
Average Daily Intake	Adult	µg/day	192	290			1974-1978	USA	801
Average Daily Intake	Adult	µg/day	176	243	243		1990	UK	831
Average Daily Intake	0 - 6 months	µg/day			40		1993	USA/ Europe	834
Average Daily Intake	1 - 3 years	µg/day			70		1993	USA/ Europe	834
Average Daily Intake	11 - 51+ years	µg/day			150		1993	USA/ Europe	834
Average Daily Intake	4 - 6 years	µg/day			90		1993	USA/ Europe	834
Average Daily Intake	6 - 12 months	µg/day			50		1993	USA/ Europe	834
Average Daily Intake	7 - 10 years	µg/day			120		1993	USA/ Europe	834
Average Daily Intake	Lactating women	µg/day			200		1993	USA/ Europe	834
Average Daily Intake	Pregnant women	µg/day			175		1993	USA/ Europe	834

Classification	Item	Units	Min	Max	Average	Number	Year	Country	Reference
Average Daily Intake	0 - 6 months	µg/day			90		1993	USA/ Europe	834
Average Daily Intake	1 - 3 years	µg/day			90		1993	USA/ Europe	834
Average Daily Intake	11 - 51+ years	µg/day			150		1993	USA/ Europe	834
Average Daily Intake	4 - 6 years	µg/day			90		1993	USA/ Europe	834
Average Daily Intake	6 - 12 months	µg/day			90		1993	USA/ Europe	834
Average Daily Intake	7 - 10 years	µg/day			120		1993	USA/ Europe	834
Average Daily Intake	Lactating women	µg/day			200		1993	USA/ Europe	834
Average Daily Intake	Pregnant women	µg/day			200		1993	USA/ Europe	834
Average Daily Intake		µg/day	200	400			1993	USA	834
Average Daily Intake		µg/day	55	75			1993	France	834
Average Daily Intake		µg/day			25		1993	Italy	834
Average Daily Intake		µg/day			15		1993	Germany	834
Average Daily Intake	Canadian population	µg/day			1000		1993	Canada	838
Average Daily Intake	Ontario infants 1 - 4 years	µg/day			250		1993	Canada	838
Average Daily Intake	Adult	µg/day	100	20 000			1993	Japan	840
Average Daily Intake	Men	µg/day			57	392	1988	Germany	841
Average Daily Intake	Women	µg/day			51	392	1988	Germany	841
Average Daily Intake	Men	µg/day			61	392	1991	Germany	841
Average Daily Intake	Women	µg/day			45	392	1991	Germany	841
Average Daily Intake	Adult	µg/day			100		1960's	UK	847
Average Daily Intake	Adult	µg/day			86.3		1976	UK	847
Average Daily Intake	Adult	µg/day	116	1051	323	200	1977 - 1979	UK	847
Average Daily Intake	Adult	µg/day			255		1993	UK	847
Average Daily Intake	Adult	µg/day			110		1999	Ukraine	894
Average Daily Intake	Adult	µg/day			1770		1999	Japan	894
Average Daily Intake	Adult	µg/day	170	280			1985 - 1991	UK	1086
Average Daily Intake	Adult	µg/day			250		1997	UK	1086
Average Daily Intake	Adult	µg/day			100		1997	New Zealand	1086
Average Daily Intake	Adult	µg/day			170		1997	China	1086
Average Daily Intake	Adult	µg/day			446		1979	Canada	1098
Average Daily Intake	Adult	µg/day			108		1979	Yugoslavia	1098
Average Daily Intake	Adult	µg/day			696		1981	USA	1098
Average Daily Intake	Adult	µg/day			323		1982	UK	1098
Average Daily Intake	Adult	µg/day			210		1982	Netherlands	1098
Average Daily Intake	Adult	µg/day			340		1982	Finland	1098
Average Daily Intake	Adult	µg/day			305		1984	New Zealand	1098
Dietary Contribution	Drinking water	% daily intake		20			1967	World	612
Dietary Contribution	Drinking water	% daily intake		10			1976	World	612
Dietary Contribution	Grains	% daily intake	17	38			1982 - 1989	USA	748
Dietary Contribution	Dairy	% daily intake	20	59			1982 - 1989	USA	748
Dietary Contribution	Eggs	% daily intake	2	4			1982 - 1989	USA	748
Dietary Contribution	Meat	% daily intake	4	12			1982 - 1989	USA	748
Dietary Contribution	Mixed dishes	% daily intake	6	10			1982 - 1989	USA	748
Dietary Contribution	Puddings	% daily intake	3	10			1982 - 1989	USA	748
Dietary Contribution	Vegetable	% daily intake	4	8			1982 - 1989	USA	748
Dietary Contribution	Kelp	µg/day			100 000		1991	Japan	748
Dietary Contribution	Other cereals	µg/day			4.08		1995	UK	772
Dietary Contribution	Beverages	µg/day			34.44		1995	UK	772
Dietary Contribution	Bread	µg/day			4.32		1995	UK	772
Dietary Contribution	Cows milk	µg/day			82.35		1995	UK	772
Dietary Contribution	Dairy products	µg/day			8.91		1995	UK	772
Dietary Contribution	Eggs	µg/day			7.58		1995	UK	772
Dietary Contribution	Fish	µg/day			18.66		1995	UK	772
Dietary Contribution	Fruit	µg/day			2.64		1995	UK	772
Dietary Contribution	Fruit products	µg/day			2.38		1995	UK	772
Dietary Contribution	Carcass	µg/day			1.25		1995	UK	772

Classification	Item	Units	Min	Max	Average	Number	Year	Country	Reference
Dietary Contribution	Meat products	µg/day			9.09		1995	UK	772
Dietary Contribution	Offal	µg/day			0.09		1995	UK	772
Dietary Contribution	Poultry	µg/day			1.04		1995	UK	772
Dietary Contribution	Nuts	µg/day			0.08		1995	UK	772
Dietary Contribution	Oils and Fats	µg/day			1.28		1995	UK	772
Dietary Contribution	Sugar and Preserves	µg/day			11.62		1995	UK	772
Dietary Contribution	Canned vegetables	µg/day			1.40		1995	UK	772
Dietary Contribution	Green vegetables	µg/day			1.44		1995	UK	772
Dietary Contribution	Other vegetables	µg/day			3.00		1995	UK	772
Dietary Contribution	Potatoes	µg/day			10.27		1995	UK	772
Dietary Contribution	Beer	µg/day			20		1987	UK	779
Dietary Contribution	Beverages	µg/day			35		1987	UK	779
Dietary Contribution	Cereal products	µg/day			30		1987	UK	779
Dietary Contribution	Egg and egg dishes	µg/day			11		1987	UK	779
Dietary Contribution	Fats	µg/day			6		1987	UK	779
Dietary Contribution	Fish and fish products	µg/day			17		1987	UK	779
Dietary Contribution	Fruit and nuts	µg/day			4		1987	UK	779
Dietary Contribution	Meat and meat products	µg/day			13		1987	UK	779
Dietary Contribution	Milk and milk products	µg/day			77		1987	UK	779
Dietary Contribution	Sugar and Preserves	µg/day			11		1987	UK	779
Dietary Contribution	Vegetables	µg/day			9		1987	UK	779
Dietary Contribution	Beverages	µg/day	16	61			1974-1978	USA	801
Dietary Contribution	Cereals	µg/day	120	317			1974-1978	USA	801
Dietary Contribution	Dairy products	µg/day	427	534			1974-1978	USA	801
Dietary Contribution	Fruit	µg/day	3.8	8.4			1974-1978	USA	801
Dietary Contribution	Leafy Vegetables	µg/day	0.7	0.9			1974-1978	USA	801
Dietary Contribution	Legume Vegetables	µg/day	1.2	2.2			1974-1978	USA	801
Dietary Contribution	Meat, fish poultry	µg/day	80	103			1974-1978	USA	801
Dietary Contribution	Other Vegetables	µg/day	1.4	2.3			1974-1978	USA	801
Dietary Contribution	Oils and Fats	µg/day	3.5	7.5			1974-1978	USA	801
Dietary Contribution	Potatoes	µg/day	2.7	6.2			1974-1978	USA	801
Dietary Contribution	Root Vegetables	µg/day	0.3	0.6			1974-1978	USA	801
Dietary Contribution	Sugars	µg/day	95	261			1974-1978	USA	801
Dietary Contribution	Cereal products	µg/day			31		1982	UK	828
Dietary Contribution	Cows milk	µg/day			92		1982	UK	828
Dietary Contribution	Fish products	% daily intake			5		1982	UK	828
Dietary Contribution	Meat products	µg/day			36		1982	UK	828
Dietary Contribution	Bread	µg/day			100		1963	Australia	839
Dietary Contribution	Cereal	µg/day			26		1997 - 1998	UK	1151
Dietary Contribution	Dairy products	µg/day			66		1997 - 1998	UK	1151
Dietary Contribution	Eggs	µg/day			5		1997 - 1998	UK	1151
Dietary Contribution	Fat spreads	µg/day			3		1997 - 1998	UK	1151
Dietary Contribution	Meats	µg/day			11		1997 - 1998	UK	1151
Dietary Contribution	Fish	µg/day			12		1997 - 1998	UK	1151
Dietary Contribution	Vegetables	µg/day			9		1997 - 1998	UK	1151
Dietary Contribution	Fruits & nuts	µg/day			2		1997 - 1998	UK	1151
Dietary Contribution	Sugar & confectionery	µg/day			5		1997 - 1998	UK	1151
Dietary Contribution	Beverages	µg/day			11		1997 - 1998	UK	1151
Dietary Contribution	Miscellaneous	µg/day			6		1997 - 1998	UK	1151
Dietary Contribution	Cereal	% daily intake			17		1997 - 1998	UK	1151
Dietary Contribution	Dairy products	% daily intake			42		1997 - 1998	UK	1151
Dietary Contribution	Eggs	% daily intake			3		1997 - 1998	UK	1151
Dietary Contribution	Fat spreads	% daily intake			2		1997 - 1998	UK	1151
Dietary Contribution	Meats	% daily intake			7		1997 - 1998	UK	1151
Dietary Contribution	Fish	% daily intake			8		1997 - 1998	UK	1151
Dietary Contribution	Vegetables	% daily intake			6		1997 - 1998	UK	1151

Classification	Item	Units	Min	Max	Average	Number	Year	Country	Reference
Dietary Contribution	Fruits & nuts	% daily intake			1		1997 - 1998	UK	1151
Dietary Contribution	Sugar & confectionery	% daily intake			3		1997 - 1998	UK	1151
Dietary Contribution	Beverages	% daily intake			7		1997 - 1998	UK	1151
Dietary Contribution	Miscellaneous	% daily intake			4		1997 - 1998	UK	1151
Dietary Iodine from bread	11-15 Females	µg/day			196		1970	Tasmania	813
Dietary Iodine from bread	11-15 Males	µg/day			235		1970	Tasmania	813
Dietary Iodine from bread	1-3 Females	µg/day			81		1970	Tasmania	813
Dietary Iodine from bread	1-3 Males	µg/day			81		1970	Tasmania	813
Dietary Iodine from bread	15-18 Females	µg/day			170		1970	Tasmania	813
Dietary Iodine from bread	15-18 Males	µg/day			270		1970	Tasmania	813
Dietary Iodine from bread	18-35 Females	µg/day			113		1970	Tasmania	813
Dietary Iodine from bread	18-35 Males	µg/day			218		1970	Tasmania	813
Dietary Iodine from bread	35-64 Females	µg/day			113		1970	Tasmania	813
Dietary Iodine from bread	35-64 Males	µg/day			194		1970	Tasmania	813
Dietary Iodine from bread	3-7 Females	µg/day			130		1970	Tasmania	813
Dietary Iodine from bread	3-7 Males	µg/day			130		1970	Tasmania	813
Dietary Iodine from bread	7-11 Females	µg/day			163		1970	Tasmania	813
Dietary Iodine from bread	7-11 Males	µg/day			187		1970	Tasmania	813
Dietary Human Milk	Infant Urine	µg/dl			9.9	68	1996	Nigeria	310
Dietary Human Milk	Mother Urine	µg/dl			14.5	68	1996	Nigeria	310
Dietary Meal	Meals for hospitals	µg/day	89	4746		30	1982 - 1984	Japan	1098
Dietary Meal	Meals for adults	µg/day	45	1921		28	1982 - 1984	Japan	1098
Dietary Meal	Meals for schools	µg/day	18	43		10	1982 - 1984	Japan	1098
Dietary Meal	Meals for university	µg/day	47	203		13	1982 - 1984	Japan	1098
Recommended Daily Intake	Recommended Minimum	µg/day	50	80			1995	Germany	313
Recommended Daily Intake	Adults	µg/day	100	200	150		1969	UK	612
Recommended Daily Intake	Adult	µg/day	44	162			1935	World	657
Recommended Daily Intake	Adult	µg/day	100	200			1937	World	657
Recommended Daily Intake	Adult	µg/day	100	200			1938	World	657
Recommended Daily Intake	Adult	µg/day	160	200			1964	World	657
Recommended Daily Intake	Adult	µg/day	70				1991	UK	775
Recommended Daily Intake	Infant	µg/day	50				1991	UK	775
Recommended Daily Intake	Adult	µg/day	140				1991	UK	775
Recommended Daily Intake	11-15 Females	µg/day			115		1970	Tasmania	813
Recommended Daily Intake	11-15 Males	µg/day			135		1970	Tasmania	813
Recommended Daily Intake	1-3 Females	µg/day	55	69			1970	Tasmania	813
Recommended Daily Intake	1-3 Males	µg/day	55	60			1970	Tasmania	813
Recommended Daily Intake	15-18 Females	µg/day			120		1970	Tasmania	813
Recommended Daily Intake	15-18 Males	µg/day			150		1970	Tasmania	813
Recommended Daily Intake	18-35 Females	µg/day			100		1970	Tasmania	813
Recommended Daily Intake	18-35 Males	µg/day			140		1970	Tasmania	813
Recommended Daily Intake	35-64 Females	µg/day			90		1970	Tasmania	813
Recommended Daily Intake	35-64 Males	µg/day			110		1970	Tasmania	813
Recommended Daily Intake	3-7 Females	µg/day	70	80			1970	Tasmania	813
Recommended Daily Intake	3-7 Males	µg/day	70	80			1970	Tasmania	813
Recommended Daily Intake	7-11 Females	µg/day	100	125			1970	Tasmania	813
Recommended Daily Intake	7-11 Males	µg/day	100	125			1970	Tasmania	813
Recommended Daily Intake	Dietary requirement I	µg/day			50		1993	World	834
Recommended Daily Intake	Recommended Minimum	µg/day	160				1993	Canada	838
Recommended Daily Intake	Adult	µg/day			150		1996	World	1083
Recommended Daily Intake	Adult	µg/day	100	140			1997	UK	1086
Upper Safe Limit	Adult	µg/day		1000			1991	UK	775
Max Tolerable Daily Intake	Adult	µg/kgbw/day		17			1997	UK	1086

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