Database of the Fluoride (F) content of Selected Drinks and Foods in the UK

Prepared by

Professor V Zohoori (Teesside University) & Professor A Maguire (Newcastle University)

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Professor Vida Zohoori
Professor of Oral Public Health and Nutrition
School of Health and Social Care
Constantine Building
Teesside University
Borough Road
Middlesbrough
TS1 3BA
UK
Tel: +44 (0) 1642 342973
Email: v.zohoori@tees.ac.uk

Professor Anne Maguire
Clinical Professor of Preventive Dentistry
Centre for Oral Health Research, School of Dental Sciences
Newcastle University
Framlington Place
Newcastle upon Tyne
NE2 4BW
UK
Tel: 44 (0) 191 2088564
Email: anne.maguire@ncl.ac.uk

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At Newcastle University: fmsenterprise@ncl.ac.uk (F.A.O Dr Geraint Lewis)
At Teesside University: business@tees.ac.uk (F.A.O. Dr Geoff Archer)

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Disclaimers
In this publication, any references to commercial products and names of companies/food manufacturers are merely for the purpose of providing the information on their fluoride contents. We do not intend to either suggest or recommend any products listed in this publication or denounce those that are not mentioned.

1. General Introduction

Fluoride is a trace element which, following absorption from the gastro-intestinal tract (GIT), is mainly incorporated into calcified tissues. More than 99% of the body burden of fluoride is in bones and teeth and therefore fluoride has an important nutritional and public health impact due to its beneficial role in the mineralization of these tissues [1]. It has been well documented that the topical use of fluorides can reduce dental decay by up to 50% and as a public health measure fluoride has a valuable role in improving the oral health of communities. However, several studies in industrialised and developing countries have shown an increase in the prevalence of dental fluorosis(tooth mottling) in both water-fluoridated and non- water-fluoridated communities [2, 3] and there has been some suggestion that this may be due to excessive chronic systemic exposure to fluorides from a number of sources.

According to the current consensus, a total daily fluoride intake of 0.05–0.07 mgF/kg body weight in children is generally regarded as 'optimal' for dental health benefits. However, to avoid an undesirable degree of dental fluorosis the total daily fluoride intake should not exceed 0.10 mg F/kg body weight [4]. This is in line with the UK's Department of Health guidance [5, 6] which states that '*intakes of F of 0.12 mg/kg body weight per day in infants and children between 6 months and 6 years of age are safe*' and '*intakes of F of 0.05 mg/kg body weight daily in children aged over 6 years and in adults are therefore safe*'. The US Institute of Medicine (IoM) [7] has set an Adequate Intake (AI) of 0.01 mg/day (0.001-0.003 mg/kg bw/day) for infants from birth until 6 months of age; 0.05 mg/kg body weight per day for children older than 6 months of age, and for adults. The IoM also suggests a fluoride intake of 0.10 mg/kg body weight per day as an upper limit (UL) in children younger than 8 years to reduce the risk of dental fluorosis and an UL of 10 mg/day for those older than 8 years to reduce the risk of skeletal fluorosis.

Obtaining the best balance between substantial caries reduction and avoidance of unsightly dental enamel opacities is of critical importance to public health planners. The global increase in the prevalence of dental caries in children highlights the need for primary prevention programmes. An estimation of total daily fluoride intake at both an individual and community level is very important when recommendations for systemic and topical fluoride use are being considered with the goals of maximising dental caries prevention while minimising risk of dental fluorosis.

Fluoride is also one of only few known agents that can stimulate bone cell proliferation and increase new mineral deposition in cancellous bone. However, the effect of fluoride on fracture risk and osteoporosis is still controversial, showing an increase risk to no effect to a decreased risk [8].

The main sources of ingested fluoride include a diet comprising fluoridated water, foods and drinks prepared with water or which contain fluoride naturally, as well as inadvertent ingestion of fluoride-containing dentifrices, mainly in children. However, the contribution of diet, including water, to total daily fluoride intake in children could be up to 70%.[9, 10]. Data from fluoride intake studies of children in the UK indicate that diet contributes between 41% and 65% of total daily fluoride intake in 6-7-year-olds [11, 12] depending on the fluoride concentration of their drinking water. Diet has also been recorded as the sole source of fluoride exposure for 87% of infants in the UK according to a study conducted in 2014 [13]. For UK 6-7-year-olds receiving >0.7 ppm fluoride water, squashes and cordials, carbonated soft drinks and tap water together account for 48% of dietary fluoride intake while for those children living in <0.3 ppm fluoride

water areas, solid foods (particularly bread) provide the main dietary fluoride source and contribute 67% of the daily dietary fluoride intake [11, 12].
Information on total fluoride exposure is important for public health planners and healthcare professionals when examining the relationship between fluoride exposure and human health and/or planning effective community-based fluoride therapy for the prevention of dental caries and/or dental fluorosis. A national fluoride database is therefore needed to facilitate estimation of dietary fluoride intake at individual or community levels. This publication provides information on fluoride concentrations of the most commonly consumed food and drink items in the UK, compiled from the results of a range of research projects conducted since 2003 [11-18].

2. Method

2.1 Selection of foods

The selection of food and drink items, in this publication, has been mainly determined by collecting dietary information, using a 3-day food diary, from parents of children younger than 7 years of age. The most consumed food/drink items and core contributors of dietary fluoride intake were identified by analysing the food diaries.

2.2 Sampling

All the consumed items of food and drink recorded in food-diaries were listed for collection. For most items, a number of samples were purchased at different shops, supermarket chains or other retail outlets. For each item, three different batch numbered products of different brands were purchased. Samples of home-made food and drink items were also obtained from households and samples of school dinners were obtained from the schools, where relevant.

3. Sample preparation

The samples of each individual product were not analysed separately but were pooled before analysis. A composite sample was made up from a number of different brands of food/drink item:

i. Ready-to-eat items: Equal weights/volumes of each specific purchased product were mixed together and aliquots of the mixed pooled composite samples were taken for fluoride analysis[14, 18].
ii. Samples needing preparation/cooking: If the food required preparation prior to consumption, techniques such as washing, diluting, cooking etc. were made as similar as possible to normal domestic practices or followed the manufacturers' instructions. The three different batch numbered products of each brand were pooled by mixing equal weights/volumes of the 3 batch items. The pooled sample was then prepared/cooked. Equal weights/volumes of each brand were mixed together and aliquots of the mixed pooled composite samples were taken for fluoride analysis. For the products requiring water for preparation, deionised distilled water (<0.02 ppm F), non-fluoridated tap water from Middlesbrough (0.13 ppm F) and fluoridated tap water from Newcastle upon Tyne (0.9 ppm F) [13-15] were used to prepare the samples.
iii. Tea samples reported in Table 3: Infusions of tea samples were prepared by using boiled deionised distilled water (<0.02 ppmF): i.e. one tea bag per cup (200 ml); 1 teaspoon of dry leaves (2.2g) per cup (200 ml); 1 teaspoon instant tea (1.0 g) per cup (200 ml). Each sample was brewed for either 1, 10 or 60 minutes.

4. Fluoride analysis

Each composite was analysed in triplicate for fluoride concentration:

i. Non-milk-based drinks: The fluoride content of each non-milk-based drink composite, in both its concentrated form and when prepared with water, was measured directly using a fluoride-ion-selective electrode (Orion Research, model 96-09) after adding a total ionic strength adjustment buffer [14, 19].
ii. Food, infant formula, milk and milk-based drinks: The fluoride content of each composite of milk and milk-based drinks as well as infant milk formula and food samples, in both their dry form and when prepared with water, was measured using the Hexamethyldisiloxane (HMDS)-facilitated diffusion method [13, 20].

Reliability and validity of the analytical methods were confirmed by i) re-analysis of 10% of the samples and ii) measurement of recovery of a known amount of fluoride added to 10% of samples.

5. Arrangement of the tables

Food and drinks have been arranged in three separate tables based on mutual characteristics: 'General Food and Drinks' (Table 1), 'Infant Food and Drinks' (Table 2), and 'Tea, infused' (Table 3).

5.1. General Food and Drinks (Table 1)

5.1.1. Food/drink name

The food name has been chosen based on the most well-known UK Food Composition Table: i.e. *McCance and Widowson's 'The Composition of Foods'*.
Food/drinks have also been positioned in groups according to their types, similar to those used in *McCance and Widowson's 'The Composition of Foods'*, 5th edition

5.1.2. Food/drink code

For ease of reference and compatibility with the UK Food Composition Tables, each food/drink has been allocated the same code as in *McCance and Widowson's 'The Composition of Foods'*, 5th edition, with a unique 2-digit prefix.
These prefixes and groups are:

11 - Cereals and Cereal Products,
12 - Milk Products and Eggs,
13 - Vegetables, Herbs and Spices,
14 - Fruit and Nuts,
15 - Vegetable Dishes,
16 - Fish and Fish Products,
17 - Miscellaneous Foods,
18 - Meat, Poultry and Game,
19 - Meat Products and Dishes

5.2. Infant Food and Drinks (Table 2)

Chronic excessive ingestion of fluoride in infancy and early childhood can increase the risk of dental fluorosis. The most important period for development of dental fluorosis in primary molar teeth and permanent maxillary central incisors is in children aged 6-9 months [21], and in the first 24 months of life [22], respectively. Diet is reported as the

predominant source of F intake for infants up to the age of 12 months [9]. The contribution of dietary fluoride to total ingested fluoride can range from almost 100% in 6 week old infants to 85% in 12 month old infants [9, 23].
In this publication, 'Infant Food and Drinks' is presented as a separate table, covering a substantial number of analysed items due to the importance of monitoring fluoride exposure in infancy and early childhood. In contrast,, infant foods and drinks are not presented in The UK Food Composition Tables as a separate group. In *McCance and Widowson's 'The Composition of Foods'*, infant rusks are covered in *"11 - Cereals and Cereal Products",* infant formulas are presented under the "*12 - Milk Products and Eggs"* and other baby foods in *"17 - Miscellaneous Foods"*.
In Table 2, the food name has been given as the manufacturer's name followed by the name of product as labelled; therefore no food code is provided.
Foods have been arranged in groups with common characteristics. The arrangement of the food groups in Table 2 is as follows: *Cereals and Cereal Products*, *Fish and Fish Products, Fruit and Nuts, Meat Products and Dishes, Milk Products, Miscellaneous Foods, Drinking Water, and Vegetable Dishes.* Generally the order within the groups is alphabetical, based on manufacturer name. It should be reinforced that reference to brand names or companies in this table is only for the purpose of specifying information and does not indicate recommendation or endorsement over others not stated.

5.3. Tea, infused (Table 3)

The tea plant (*camellia sinensis*) is the only plant known to take up fluoride in considerable amounts from soil and accumulate it in its leaves. Therefore, tea could be potentially an important source of dietary fluoride intake, particularly in areas where tea drinking is common. A review of the literature shows a wide range in the fluoride concentration of tea infusions. Therefore, in this publication, a separate table (Table 3) has been dedicated to fluoride concentrations of infused teas according to brand.

6. Calculation of fluoride intake using the tables

All values in the tables are quoted per 100g edible portion and the F content is expressed in metric units (µg fluoride/100g of food). The imperial equivalents are:

1 ounce (oz)=28.35g	100g=3.53 oz
1 pound (lb)=453.6g	1kg=2.2 lb (2lb 3oz)
1 pint (pt)=568ml	1 litre=1.76 pt

From the tables, fluoride intake can be calculated by following several steps:

i. From the tables, select the item which matches most closely with the consumed food and record its fluoride content (µg/100g);
ii. Multiply the fluoride content (µg/100g) by the weight of food consumed divided by 100: e.g. if 40g of food is consumed, the fluoride content should be multiplied by 0.4 and if 140g is consumed the fluoride content should be multiplied by 1.4.
iii. Repeat the calculation steps 'i' and 'ii' for all food and drink consumed and then sum the values for all items consumed to obtain the total intake.

7. Potential pitfalls when using the tables-

There can be no guarantee that a particular item will have precisely the same fluoride content as that recorded in these tables because of the variability in the composition of foods.

7.1 The variability of fluoride in foods

Although values in these tables have been derived from careful analyses of representative samples of each food, it is important to be aware of a potential considerable variation in the composition of any individual sample. The variations could be as a result of natural (intrinsic) and/or extrinsic differences.

7.1.1 Natural (intrinsic) variations

There are some differences in composition of all natural products. Two samples taken from the same animal or plant species may vary considerably. The composition of animal products could be affected by the feeding regime, season and age of the animal. Different varieties of the same plant may differ in composition, depending on country of origin, growing conditions and subsequent storage. It has been reported that concentration of fluoride is higher in plants grown in acidic soil than those grown in alkaline soil [24].

In general, storage is a another major factor which could alter the concentration of any nutrient in foods containing water as the main constituent. The water content of foods can be affected by the conditions and length of food storage and consequently their nutrient content per 100g.

7.1.2 Extrinsic variations

Additional variations in fluoride content of individual food/drinks can be introduced by food manufacturers, caterers, and in the home. Any changes in recipes, amounts and types of ingredients may result in an alteration of fluoride content of the prepared food/drink.

Examples of some external influences on fluoride content of food/drinks:

i. Food/drinks processed with fluoridated water may contain more fluoride than those processed with low-fluoride water [15]. As a result, foods cooked in and prepared with tap waters which contain variable amounts of fluoride, may not have the same fluoride content as that shown in the tables, in the present publication.

ii. Use of additives, such as spices, pepper or salt, can result in an elevation of fluoride content of prepared foods [25].

iii. The material and composition of the cooking vessel may influence the fluoride content of cooked food. The fluoride content of food diminishes when using aluminium pots, but increases when using Teflon-coated vessels[26].

iv. The method of preparing a food may also alter the amount of fluoride it contains. For example, when animal or fish bone fragments or bone dust are included in dishes during preparation, their fluoride content is increased [27].

7.2 Bioavailability of fluoride

The term bioavailability (biological availability) is defined as the proportion of an ingested nutrient in food that is absorbed and used for normal body function and which

can be influenced by both dietary and physiologically- (host) related factors [28]. Therefore, the amount of fluoride in an individual food or drink might not be a true reflection of the amount which is absorbed in the body.
Dietary-related factors include the physical and chemical form of fluoride in a food and its solubility and the presence of enhancers or inhibitors of fluoride absorption. For example, when fluoride, as sodium fluoride, is ingested with water, almost 100% is absorbed but when fluoride is consumed in milk or baby formula or foods containing divalent or trivalent cations (such as calcium), the degree of systemic fluoride absorption is decreased [29]. Conversely, a diet high in fat content may increase fluoride absorption due to a reduction in the rate of gastric emptying [29].
Physiologically-related factors include the composition and volume of gastric and intestinal secretions, and a number of host-related variables, many of which are essential parts of the body's homeostatic regulatory mechanism (e.g. nutritional status, development state).

8. References

1 American Dietetic Association. Position of the American Dietetic Association: The Impact of fluoride on health; 2000.
2 Szpunar S, Burt B. Fluoride exposure in Michigan schoolchildren. Journal of Public Health Dentistry. 1990;50:18-23.
3 Pendrys DG, Stamm JW. Relationship of total fluoride intake to beneficial effects and enamel fluorosis. Journal of Dental Research. 1990;69(Spec No):529-38; discussion 56-7.
4 Burt BA. The changing patterns of systemic fluoride intake. Journal of Dental Research. 1992;71(5):1228-37.
5 Department of Health. Infant feeding recommendations. London: Department of Health; 2003.
6 Department of Health. An Oral Health Strategy for England: London: Department of Health; 1994.
7 Institute of Medicine. Dietary Reference Intakes for Calcium, Magnesium, Vitamin D, and Fluoride. Washington DC:National Academy Press.; 1999.
8 Li YM, Liang CK, Slemenda CW, Ji RD, Sun SZ, Cao JX, et al. Effect of long-term exposure to fluoride in drinking water on risks of bone fractures. J Bone Miner Res. 2001 May;16(5):932-9.
9 Levy SM, Warren JJ, Davis CS, Kirchner HL, Kanellis MJ, Wefel JS. Patterns of fluoride intake from birth to 36 months. Journal of Public Health Dentistry. 2001;61(2):70-7.
10 Levy SM, Warren JJ, Broffitt B. Patterns of fluoride intake from 36 to 72 months of age. Journal of Public Health Dentistry. 2003;63(4):211-20.
11 Maguire A, Zohouri FV, Hindmarch PN, Hatts J, Moynihan PJ. Fluoride intake and urinary excretion in 6- to 7-year-old children living in optimally, sub-optimally and non-fluoridated areas. Community Dentistry and Oral Epidemiology. 2007;35(6):479-88.
12 Zohoori FV, Walls R, Teasdale L, Landes D, Steen IN, Moynihan P, et al. Fractional urinary fluoride excretion of 6-7-year-old children attending schools in low-fluoride and naturally fluoridated areas in the UK. Br J Nutr. 2013 May 28;109(10):1903-9.

13 Zohoori FV, Whaley G, Moynihan PJ, Maguire A. Fluoride intake of infants living in non-fluoridated and fluoridated areas. Br Dent J. 2014 Jan;216(2):E3.
14 Zohoori FV, Maguire A, Moynihan PJ. Sources of Dietary Fluoride Intake in 6-7 Year Old English Children Receiving Optimally, Sub-optimally, and Non-fluoridated water. Journal of Public Health Dentistry. 2006;66(4):227-34.
15 Zohoori FV, Moynihan PJ, Omid N, Abuhaloob L, Maguire A. Impact of water fluoride concentration on the fluoride content of infant foods and drinks requiring preparation with liquids before feeding. Community Dentistry and Oral Epidemiology. 2012;40(5):432-40.
16 Zohouri FV, Maguire A, Moynihan PJ. Fluoride content of still bottled waters available in the North-East of England, UK. British Dental Journal. 2003 Nov 8;195(9):515-8; discussion 07.
17 Zohouri FV, O'Hanlon C, Hatts J, Moynihan PJ, Maguire A. Fluoride concentration of confectionary in the UK. *IADR* 2003.
18 Maguire A, Omid N, Abuhaloob L, Moynihan PJ, Zohoori FV. Fluoride content of ready-to-feed (RTF) infant food and drinks in the UK. Community Dent Oral Epidemiol. 2012 Feb;40(1):26-36.
19 Martinez-Mier EA, Cury J, HEilman J, Levy SM, Li Y, Maguire A, et al. Development of Standard Fluoride Analytical Methods: direct analysis. . Caries Research 2004;38:372.
20 Martínez-Mier EA, Cury J.A., Heilman J.R. , Katz B.P., Levy S.M., Li Y., et al. Development of gold standard ion-selective electrode-based methods for fluoride analysis Caries Research. 2011;45:3-12.
21 Levy SM, Hillis SL, Warren JJ, Broffitt BA, Mahbubul Islam AKM, Wefel JS, et al. Primary tooth fluorosis and fluoride intake during the first year of life. Community Dentistry & Oral Epidemiology. 2002 Aug;30(4):286-95.
22 Hong L, Levy SM, Broffitt B, Warren JJ, Kanellis MJ, Wefel JS, et al. Timing of fluoride intake in relation to development of fluorosis on maxillary central incisors. Community Dentistry & Oral Epidemiology. 2006 Aug;34(4):299-309.
23 Levy SM, Maurice TJ, Jakobsen JR. Feeding patterns, water sources and fluoride exposures of infants and 1-year-olds. Journal of the American Dental Association. 1993 Apr;124(4):65-9.
24 Murray JJ, ed. Appropriate Use of Fluorides for Human Health, . Geneva: World Health Organization 1986
25 Nanda RS. Fluoride Content of North Indian Foods. Indian J Med Res. 1972;60(10):1470-82.
26 Full CA, Parkins FM. Effect of cooking vessel composition on fluoride. Journal of Dental Research. 1975;54(1):192.
27 Walters CB, Sherlock JC, Evans WH, Read JI. Dietary intake of fluoride in the United Kingdom and fluoride content of some foodstuffs. Journal of Sciences of Food Agriculture. 1983;34:523-8.
28 FairweatherTait S, Hurrell RF. Bioavailability of minerals and trace elements. Nutr Res Rev. 1996;9:295-324.
29 Whitford GM. Metabolism and Toxicity of Fluoride. Basel: Karger 1996.

9. Fluoride (F) Database of UK food and drinks

Table 1: General Food and Drinks

Table 2: Infant Food and Drinks

Table 3: Tea, infused

Table 1: General Food and Drinks

NOTE:
The fluoride content of food was measured based on 10 samples, purchased from popular supermarkets in the UK and mixed together prior to fluoride analysis.

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
Cereal & Cereal Products						
	11043	White rice, easy cook, boiled				175.20
	11056	Noodles, egg, boiled		10.75	17.70	41.30
	11059	Noodles, plain, boiled		10.75	17.70	41.30
	11062	Spaghetti, white, boiled		57.00	113.70	293.40
	11064	Spaghetti, wholemeal, boiled		57.00	113.70	293.00
	11070	Brown bread, average	22.20			
	11078	Granary bread	22.20			
	11086	Naan bread	56.10			
	11093	Tortillas, made with wheat flour	55.30			
	11099	White bread, average	56.10			
	11102	White bread, sliced	56.10			
	11107	White bread, French stick	3.80			
	11113	Wholemeal bread, average	22.20			
	11117	Wholemeal bread, toasted	9.70			
	11121	Hamburger buns	13.10			
	11122	Morning rolls	31.40			
	11124	White rolls, soft	13.10			
	11129	Coco Pops	17.40			
	11130	Corn Flakes	7.95			
	11131	Crunchy Nut Corn Flakes	7.95			
	11133	Frosties	13.20			
	11140	Nutri-Grain	73.50			

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	11141	Porridge, made with whole milk	75.30			
	11145	Ready Brek	75.30			
	11146	Rice Krispies	3.90			
	11148	Shredded Wheat	13.50			
	11149	Shreddies	7.05			
	11154	Weetabix	9.00			
	11157	Weetos	7.46			
	11166	Chocolate biscuits, full coated	7.30			
	11167	Cream crackers	16.30			
	11169	Digestive biscuits, chocolate	17.20			
	11170	Digestive biscuits, plain	11.60			
	11177	Jaffa cakes	13.00			
	11182	Sandwich biscuits	9.80			
	11184	Short-sweet biscuits	4.20			
	11185	Shortbread	4.90			
	11186	Wafer biscuits, filled	9.80			
	11187	Water biscuits	21.00			
	11188	Wholemeal crackers	13.13			
	11190	Battenburg cake	26.00			
	11195	Chocolate cake	13.00			
	11196	Chocolate cake, with butter icing	5.40			
	11198	Crispie cakes	3.30			
	11199	Fancy iced cakes, individual	5.40			
	11214	Sponge cake, with butter icing	5.40			
	11216	Swiss roll	9.10			
	11235	Crumpets, fresh	56.50			
	11239	Custard tarts, individual	10.80			
	11243	Doughnuts, ring	4.00			

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	11246	Eclairs, fresh	12.30			
	11253	Hot cross buns	56.50			
	11254	Jam tarts	10.80			
	11258	Mince pies, individual	30.10			
	11260	Muffins	18.60			
	11266	Scones, plain	36.50			
	11270	Scotch pancakes	56.50			
	11272	Strawberry tartlets	10.80			
	11276	Waffles	4.70			
	11279	Apple pie, pastry top and bottom	11.30			
	11288	Cheesecake	16.00			
	11353	Samosas, meat	27.90			
	11357	Spaghetti, canned in tomato sauce	9.30			
	11359	Yorkshire pudding	21.30			
	11460	Garlic bread, pre-packed, frozen	51.30			
	11616	Carrot cake with topping	13.90			
	11621	Ravioli, canned in tomato sauce	10.00			
Milk Products and Eggs						
	12001	Skimmed milk, average	0.80			
	12008	Semi-skimmed milk, average	0.80			
	12012	Whole milk, average	0.80			
	12042	Soya milk, plain	30.70			
	12043	Soya milk, flavoured	32.50			
	12044	Aptamil	3.00			
	12046	Cow & Gate Premium	2.80			
	12050	Gold Cap SMA	2.51			
	12052	Cow & Gate Plus	2.50			
	12066	Wysoy	2.60			

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	12094	Drinking chocolate powder, made up with whole milk	23.00			
	12095	Drinking chocolate powder, made up with semi-skimmed milk	23.00			
	12096	Drinking chocolate powder, made up with skimmed milk	23.00			
	12103	Milk shake, purchased	2.00			
	12105	Milk shake powder, made up with whole milk	23.00			
	12106	Milk shake powder, made up with semi-skimmed milk	23.00			
	12107	Milk shake powder, made up with skimmed milk	23.00			
	12113	Cream, fresh, single	2.00			
	12116	Cream, fresh, double	2.30			
	12117	Cream, fresh, clotted	2.20			
	12118	Cream, frozen, single	2.00			
	12131	Cheese, Brie	8.00			
	12134	Cheese, Cheddar, average	8.25			
	12158	Fromage frais, plain	10.20			
	12172	Processed cheese, plain	15.90			
	12173	Processed cheese, smoked	58.50			
	12184	Whole milk yogurt, plain	3.15			
	12189	Low fat yogurt, flavoured	2.80			
	12202	Cornetto	7.67			
	12205	Ice cream, dairy, flavoured	9.60			
	12210	Ice cream, with cone	7.67			
	12225	Custard, canned	2.40			
	12244	Mousse, chocolate	44.00			

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	12248	Rice pudding, canned	4.50			
	12256	Butter	0.05			
	12806	Eggs, chicken, boiled	0.57			
	12808	Eggs, chicken, fried, with fat	0.88			
	12809	Eggs, chicken, fried, without fat	0.86			
	12810	Eggs, chicken, poached	0.60			
	12811	Eggs, chicken, scrambled, with milk	0.83			
	12812	Eggs, chicken, scrambled, without milk	0.83			
	12818	Egg fried rice	34.60			
	12829	Meringue	0.57			
Vegetables, Herbs and Spices						
	13003	New potatoes, boiled in unsalted water		17.00	32.00	85.00
	13010	Old potatoes, baked, flesh and skin	14.00			
	13014	Old potatoes, boiled in unsalted water		17.00	32.00	85.00
	13015	Old potatoes, mashed with margarine		12.00	30.70	77.85
	13016	Old potatoes, roast in corn oil	8.00			
	13022	Chips, retail, fried in vegetable oil	11.20			
	13028	Microwave chips, cooked	10.90			
	13036	Potato crisps	23.80			
	13040	Potato waffles, frozen, cooked	11.00			
	13043	Baked beans, canned in tomato sauce	11.65			
	13053	Beansprouts, mung, boiled in salted water		6.80	22.85	39.80
	13083	Green beans/French beans, boiled in unsalted water		8.25	20.40	34.10
	13129	Peas, boiled in unsalted water				131.40
	13166	Beetroot, pickled, drained	0.65			
	13172	Broccoli, green, boiled in unsalted water		13.70	66.70	109.40
	13185	Cabbage, boiled in unsalted water, average		8.30	27.85	56.55

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	13202	Carrots, old, boiled in unsalted water		19.30	56.80	106.30
	13203	Carrots, young, raw	0.95			
	13217	Cauliflower, boiled in unsalted water		10.00	35.65	66.50
	13221	Celery, raw	1.40			
	13233	Cucumber, raw	1.00			
	13266	Lettuce, average, raw	5.45			
	13286	Mushrooms, common, fried in corn oil	0.73			
	13314	Parsnip, boiled in unsalted water		14.00	29.70	63.45
	13316	Peppers, capsicum, chilli, green, raw	2.07			
	13363	Sweet potato, baked	3.50			
	13367	Sweetcorn, canned, drained	5.10			
	13374	Sweetcorn, on-the-cob, whole, boiled in unsalted water		3.35	17.05	33.15
	13384	Tomatoes, raw	1.05			
	13391	Turnip, boiled in unsalted water				83.00
Fruit and Nuts						
	14012	Apples, eating, average, raw	1.90			
	14037	Avocado, average	6.80			
	14045	Bananas	0.77			
	14061	Cherries, raw	1.40			
	14087	Dried mixed fruit	19.00			
	14099	Fruit salad, homemade	2.10			
	14109	Grapes, average	2.80			
	14123	Kiwi fruit	1.00			
	14153	Melon, average	0.60			
	14171	Nectarines	3.10			
	14175	Oranges	2.30			
	14183	Peaches, raw	2.00			

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	14188	Peaches, canned in juice	7.00			
	14190	Pears, average, raw	1.80			
	14213	Plums, average, raw	1.90			
	14244	Raspberries, raw	1.57			
	14257	Satsumas	4.35			
	14260	Strawberries, raw	1.95			
	14271	Apple juice, unsweetened	6.00			
	14275	Grapefruit juice, unsweetened	45.00			
	14280	Mango juice, canned	3.30			
	14281	Orange juice, freshly squeezed	2.30			
	14283	Orange juice, unsweetened	17.20			
	14827	Mixed nuts	9.20			
	14829	Peanut butter, smooth	17.10			
	14830	Peanut butter, wholegrain	17.10			
Vegetable Dishes						
	15099	Curry, chick pea dahl	27.00			
	15143	Curry, potato, Punjabi	12.80			
	15179	Garlic mushrooms	0.73			
	15252	Pizza, cheese and tomato	31.40			
	15258	Potato cakes, fried in vegetable oil	11.20			
	15292	Salad, green	9.10			
	15295	Salad, potato, with French dressing		12.00	30.70	77.85
	15307	Sauce, curry, onion, with vegetable oil	2.80			
	15310	Sauce, tomato base	0.67			
	15343	Vegetable pate	0.73			
Fish and Fish Products						
	16023	Cod, in batter, fried in retail blend oil	358.40			
	16063	Haddock, coated in crumbs, frozen, fried in oil	8.15			

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	16182	Herring, canned in tomato sauce	319.00			
	16194	Mackerel, grilled	87.70			
	16203	Salmon, grilled	7.90			
	16215	Sardines, canned in brine, drained	1054.20			
	16229	Tuna, canned in brine, drained	12.55			
	16239	Prawns, boiled	42.40			
	16275	Curry, fish and vegetable, Bangladeshi	10.54			
	16281	Fish cakes, grilled	8.15			
	16282	Fish cakes, fried in blended oil	8.15			
	16288	Fish fingers, cod, grilled	8.00			
	16289	Fish fingers, cod, fried in blended oil	8.00			
Miscellaneous Foods						
	17013	Butter	0.05			
	17014	Butter, spreadable	0.05			
	17020	Margarine, soft, vegetable fat only	0.00			
	17038	Olive oil	0.00			
	17046	Vegetable oil, blended, average	0.00			
	17050	Honey	14.65			
	17052	Ice Magic sauce	6.80			
	17060	Sugar, brown	23.93			
	17063	Sugar, white	1.20			
	17065	Syrup, golden	5.40			
	17069	Chocolate spread	6.80			
	17073	Jam, fruit with edible seeds	2.20			
	17076	Lemon curd	4.50			
	17078	Marmalade	4.60			
	17080	Mincemeat	6.90			
	17081	Mincemeat, vegetarian	83.80			

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	17082	Bounty bar	6.50			
	17083	Chocolate covered caramels	3.70			
	17084	Chocolate covered bar with fruit/nut wafer/biscuit	9.00			
	17085	Chocolate covered ice cream bar	8.20			
	17089	Chocolate, milk	6.80			
	17091	Chocolate, white	6.00			
	17093	Kit Kat	6.40			
	17094	Mars bar	7.00			
	17095	Milky Way	6.00			
	17096	Smartie-type sweets	4.40			
	17100	Twix	9.00			
	17101	Boiled sweets	16.00			
	17102	Cereal chewy bar	8.00			
	17103	Cereal crunchy bar	8.00			
	17104	Chew sweets	90.00			
	17106	Foam sweets	28.00			
	17107	Fruit gums/jellies	22.00			
	17108	Fruit pastilles	90.00			
	17109	Fudge	7.20			
	17111	Halva, semolina	2.00			
	17114	Marshmallows	28.00			
	17119	Sherbert sweets	23.20			
	17123	Breadsticks	16.30			
	17125	Corn snacks	3.60			
	17130	Popcorn, candied	3.00			
	17131	Popcorn, plain	3.00			
	17152	Coffee, infusion, average		7.00	30.00	83.00

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	17165	Tea, black, infusion, average		60.70	123.60	193.30
	17171	Tea, green, infusion		16.00	38.00	86.00
	17172	Tea, herbal, infusion		12.00	36.00	85.30
	17175	Cola	0.09			
	17177	Fruit juice drink, carbonated, ready to drink	10.50			
	17179	Lemonade	17.50			
	17188	Blackcurrant juice drink, concentrated, made up (e.g. Ribena)		5.00	46.00	104.00
	17189	Fruit drink/squash, concentrated	9.00			
	17190	Fruit drink/squash, concentrated, made up		6.00	43.50	85.50
	17192	Fruit drink, low calorie, concentrated, made up		6.00	42.50	86.50
	17195	Fruit juice drink, ready to drink	10.20			
	17196	Fruit juice drink, low calorie, ready to drink	4.80			
	17284	Vegetable soup, canned	42.40			
	17298	Curry sauce, canned	2.80			
	17311	Gravy instant granules, made up with water		8.25	46.75	103.75
	17316	Mayonnaise	1.45			
	17322	Pasta sauce, white	3.60			
	17323	Pasta sauce, tomato based	49.40			
	17338	Tomato ketchup	0.67			
	17352	Pickle, sweet	0.65			
	17366	Quorn, myco-protein	2.20			
Meat, Poultry and Game						
	18066	Beef, sirloin steak, fried, lean	5.80			
	18072	Beef, sirloin steak, grilled well-done, lean	5.60			
	18090	Beef, topside, roasted well-done, lean	5.80			
	18091	Beef, topside, roasted well-done, lean and fat	6.00			
	18117	Lamb, chump chops, fried, lean	23.35			
	18149	Lamb, loin chops, roasted, lean	23.25			

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	18156	Lamb, loin joint, roasted, lean and fat	23.50			
	18184	Stewing lamb, pressure cooked, lean				105.00
	18185	Stewing lamb, pressure cooked, lean and fat				105.60
	18186	Stewing lamb, stewed, lean				105.00
	18187	Stewing lamb, stewed, lean and fat				105.60
	18212	Pork, chump chops, fried, lean and fat	3.10			
	18213	Pork, chump chops, fried, lean and fat, weighed with bone	3.50			
	18226	Pork, fillet slices, grilled, lean	3.00			
	18228	Pork, fillet strips, stir-fried, lean	3.00			
	18256	Pork, loin chops, roasted, lean and fat	3.30			
	18307	Chicken, breast, casseroled, meat only				54.90
	18310	Chicken, drumsticks, casseroled, meat only				54.90
	18313	Chicken, leg quarter, casseroled, meat only				54.90
	18331	Chicken, meat, average, roasted	2.50			
	18337	Chicken, leg quarter, roasted, meat and skin	3.20			
	18356	Turkey, breast, fillet, grilled, meat only	3.70			
Meat Products and Dishes						
	19002	Bacon rashers, back, dry-fried	2.80			
	19003	Bacon rashers, back, grilled	2.80			
	19022	Ham, gammon rashers, grilled	4.00			
	19023	Ham	6.93			
	19030	Beefburger, chilled/frozen, grilled	13.90			
	19041	Chicken burger, takeaway	26.70			
	19051	Beef pie, chilled/frozen, baked	7.50			
	19055	Chicken pie, individual, chilled/frozen, baked	6.40			
	19056	Cornish pastie	15.10			
	19066	Sausage rolls, puff pastry	29.60			

Food group	Food code	Food name	Fluoride content µg/100g (No preparation with water required)	F content (µg/100g) of prepared sample for food and drinks requiring preparation with water		
				Water F concentration (mgF/L)		
				0.05-0.13	0.38-0.56	0.79-0.99
	19074	Turkey pie, single crust, homemade	3.70			
	19079	Pork sausages, chilled, fried	1.60			
	19080	Pork sausages, chilled, grilled	1.60			
	19118	Chicken breast in crumbs, chilled, fried	2.10			
	19123	Chicken kiev, frozen, baked	11.80			
	19124	Chicken nuggets, takeaway	17.20			
	19126	Chicken slices	2.50			
	19130	Doner kebab in pitta bread with salad	6.90			
	19158	Turkey steaks in crumbs, frozen, grilled	16.70			
	19183	Bolognese sauce	49.40			
	19188	Chicken curry, chilled/frozen, reheated	7.20			
	19193	Chicken in sauce with vegetables, chilled/frozen, reheated	2.50			
	19209	Chilli con carne, chilled/frozen, reheated, with rice	6.90			
	19254	Pork and beef meatballs in tomato sauce	6.90			
	19269	Sausage casserole	32.60			
	19272	Spaghetti Bolognese	11.20			

Table 2: Infant Food and Drinks

NOTES:
i) The fluoride content of food was measured based on 10 samples, purchased from popular supermarkets in the UK and mixed together prior to fluoride analysis.

ii) Reference to brand names, commercial products, or companies in this publication is only for the purpose of specifying information and does not indicate recommendation or endorsement over others not stated.

Footnotes:
[1] As purchased
[2] Food/drink items were prepared according to the manufacturer's instructions when preparation with water was required.

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared[2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
Cereal & Cereal Products				
	Annabel Karmel; Mini pasta, 7+ months	171.00	31.20	142.80
	Bebivita; Apple & oat breakfast, 4-18 months	54.00	24.80	90.80
	Bebivita; Fruity breakfast cereal, 4-18 months	40.00	19.80	78.10
	Boots; Apple & apricot cereal, 4+ months	21.60	16.10	105.90
	Boots; Banana & orange breakfast, 4+ months	18.08		
	Boots; Creamy porridge, 4+ months	19.80		
	Boots; Fruit & museli, 7+ months	12.60		
	Boots; Noodles in cheese & leek sauce, 7+ months	9.73		
	Cow & Gate; Apple & blueberry cereal, 7+ months	51.30		
	Cow & Gate; Banana and mango rice pudding	5.70		
	Cow & Gate; Banana cereal, 4+ months	64.00	34.00	83.00
	Cow & Gate; Creamed porridge, 4+ months	15.20		

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared[2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
	Cow & Gate; Creamy porridge, 4+ months	52.00	29.00	123.00
	Cow & Gate; Fruit museli, 4+ months	4.80		
	Cow & Gate; Fruit porridge	20.00		
	Cow & Gate; Pure baby rice, 4+ months	38.50		
	Cow & Gate; Spaghetti with tomato & mozzarella, 7+ months	18.00		
	Cow & Gate; Tropical fruit cereal, 7+ months	64.80		
	Heinz; Baby pasta stars, 7+ months	161.80	33.20	125.30
	Heinz; Baby rice, 7+ months	145.70	15.70	118.00
	Heinz; Baby spaghetti, 7+ months	152.60	24.80	98.60
	Heinz; Cheesy vegetable pasta, 7+ months	45.00		
	Heinz; Creamed porridge, all ages	22.10		
	Heinz; Creamy oat porridge, 4+ months	14.00	15.00	71.00
	Heinz; Fruit & yoghurt breakfast, 4+ months	26.00	22.00	77.00
	Heinz; Fruit museli, 7+ months	12.00	16.00	78.00
	Heinz; Oat & apple cereal, 4+ months	22.00	16.00	101.00
	Heinz; Peachy porridge, 7+ months	16.00	11.00	77.00
	Heinz; Pure baby rice, 4 + months	73.10		
	Heinz; Spaghetti hoops & sausages, 7+ months	8.80		
	Heinz; Spaghetti hoops in tomato sauce	9.00		
	Hipp; Baby rice, Stage 1, 4+ months	68.60		
	Hipp; Banana porridge, 6+ months	34.85		
	Hipp; Breakfast duet,7+ months	11.00		
	Hipp; Creamy porridge, 6+ months	37.80	20.60	48.80
	Hipp; Creamy rice pudding, 4+ months	55.00	21.10	104.00
	Hipp; Organic baby porridge	10.80		
	Hipp; Organic creamy porridge	11.00		
	Hipp; Organic spaghetti tomato and mozzarella	10.00		
	Hipp; Rigatoni napoli, 10+ months	9.73		

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared[2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
	Hipp; Spaghetti with tomato & mozzarella, 7+ months	10.00		
	Hipp; Creamed porridge breakfast, 4+ months	3.00		
	Organix; Banana porridge, 4+ months	11.00		
	Organix; Banana porridge, 6+ months	16.30	13.60	102.40
	Organix; Creamy apple & raspberry cereal, 4+ months	28.20	15.10	120.30
	Organix; Organic creamy oat porridge, 6+ months	19.30	12.80	98.90
	Organix; Wholegrain baby rice, 4+ months	19.10	12.40	102.90
	Plum; Four grain super porridge with plum & banana, 7+ months	10.40		
	Plum; Super porridge, 4 grain, apple & apricot, 7+ months	18.63		
	Plum; Super porridge, 4 grain, the ultimate weaning food, 4+ months	52.80		
Fish and Fish Products				
	Cow & Gate; Fisherman's bake, 4+ months	10.90		
	Cow & Gate; Scrummy tuna penne, 10+ months	10.67		
	Cow & Gate; Tuna pasta in creamy mushroom sauce, 7+ months	10.50		
	Cow & Gate; Tuna pasta in creamy tomato sauce, Stage 2	17.33		
	Heinz; Creamy fish mornay, 4+ months	18.30		
	Heinz; Seaside pasta with tuna, 7+ months	22.93		
	Plum; Spinach with salmon & parsnip, 7+ months	13.60		
Fruit and Nuts				
	Bebivita; Apple & pear fruit	3.40		
	Boots; Mixed Fruit, 4+ months	5.00		
	Cow & Gate; Apple & peach, 4+ months	5.80		
	Cow & Gate; Fruitpura	9.20		
	Cow & Gate; Mango surprise, 4+ months	2.00		
	Cow & Gate; Pear & peach, 4+ months	14.80		
	Ella's Kitchen; Apple & banana, 4+ months	3.00		

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared[2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
	Ella's Kitchen; Strawberry & apple, 4+ months	8.80		
	Heinz; Fruit salad, all ages	4.40		
	Hipp; Apple & pear pudding, 4+ months	11.90		
	Hipp; Apple, orange & banana, 4+ months	46.75		
	Hipp; Smoothie (apple & banana), 10+ months	6.10		
	Hipp; Smoothie (apple & raspberry), 10+ months	7.70		
	Organix Goodies; Californian raisins	117.60		
	Organix; Apple & blueberry (100% organic fruit), 4+ months	3.60		
	Organix; Fruit bars; banana and date	5.00		
	Organix; Organic squeezy kiwi; pear and banana	3.10		
	Organix; Summer pudding, 4+ months	3.90		
	Organix; Variety pack (apple & cherry), (apple & mango), 4+ months	3.00		
	Plum; Bluberry, banana & vanilla, 4+ months	12.60		
	Plum; Mango & banana, 4+ months	19.10		
	Plum; Summer pudding, 7+ months	37.90		
Meat Products and Dishes				
	Boots; Creamy vegetable with pasta, 4+ months	8.00		
	Boots; Hearty vegetable & chicken, 7+ months	16.40		
	Boots; Spaghetti bolognese, 7+ months	9.60		
	Boots; Sweetcorn & chicken with vegetable, 4+ months	13.00		
	Boots; Vegetable & lamb hot pot, 7+ months	16.67		
	Boots; Vegetable & steak, 7+ months	4.27		
	Boots; Vegetable risotto with steak, 4+ months	12.80		
	Boots; Organic carrot and potato, Stage 1	5.00		
	Cow & Gate; Autumn orchard chicken, 10+ months	10.93		
	Cow & Gate; Baby balance cauliflower cheese, Stage 1	12.00		
	Cow & Gate; Baby scrummy spaghetti bolognese, Stage 2	16.40		

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared[2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
	Cow & Gate; Beef stroganoff, Stage 2	8.18		
	Cow & Gate; Creamed cottage pie, 4+ months	10.00		
	Cow & Gate; Creamy chicken, 4+ months	9.00		
	Cow & Gate; Creamy mushroom & chicken noodle doodle, 10+ months	10.67		
	Cow & Gate; Hearty bean & pork casserole, 10+ months	120.00		
	Cow & Gate; Mama's macaroni, 10+ months	12.00		
	Cow & Gate; Mediterranean beef stew, Stage 2	14.07		
	Cow & Gate; My favourite spaghetti bolognese, 10+ months	21.33		
	Cow & Gate; Oriental chicken, 10+ months	14.40		
	Cow & Gate; Scrummy spaghetti bolognese, 7+ months	16.40		
	Cow & Gate; Succulent pork casserole, Stage 2	10.32		
	Cow & Gate; Sweet potato bake, Stage 1	10.70		
	Cow & Gate; Sweet squash and chicken, Stage 2	20.91		
	Cow & Gate; Tasty cottage pie, 7+ months	16.50		
	Cow & Gate; Tasty cottage pie, 7+ months	6.67		
	Cow & Gate; Vegetable & chicken noodle doodle, 7+ months	10.13		
	Cow & Gate; Yummy harvest chicken, 7+ months	8.40		
	Ella's Kitchen; Chicken casserole with rice	13.96		
	Heinz; Baby chicken paella, 7+ months	27.07		
	Heinz; Chicken chasseur, 7+ months	12.27		
	Heinz; Golden vegetable & chicken, 7+ months	18.00	15.00	85.00
	Heinz; Mediterranean vegetable, chicken & sweet potato, 7+ months	10.93		
	Heinz; Mild chicken curry, 7+ months	13.90		
	Heinz; Mums own recipe chicken dinner, 7+months	16.59		
	Heinz; Mums own recipe cottage pie, 7+ months	19.80		
	Heinz; Shepherds pie with lamb, 7+ months	51.00		
	Heinz; Spaghetti bolognese 7+ months	18.60		

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared[2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
	Heinz; Spaghetti hoops and sausage 7+months	8.80		
	Heinz; Sweet potato & beef pie, 4+ months	13.00		
	Heinz; Vegetable & chicken casserole, 4+ months	12.00		
	Heinz; Vegetable bake, 7+ months	19.90		
	Hipp; Mediterranean potato & lamb, 7+ months	7.47		
	Hipp; Organic scrumptious bean and beef hotpot	10.00		
	Hipp; Organic sweetcorn, peppers and chicken risotto	8.90		
	Hipp; Pasta in tomato & ham sauce, 6+ months	6.70		
	Hipp; Spaghetti bolognese, 7+ months	9.33		
	Hipp; Spaghetti carbonara, 10+ months	11.60		
	Hipp; Sweetcorn, peppers & chicken risotto, 10+ months	8.93		
	Hipp; Tomato & chicken napolitan, 7+ months	7.00		
	Hipp; Vegetable & beef hot pot, 4+ months	50.00		
	Hipp; Vegetable & chicken risotto, 7+ months	7.20		
	Hipp; Vegetable & turkey casserole, 4+ months	14.00		
	Hipp; Vegetable with noodle & chicken, 10+ months	9.07		
	Hipp; Vegetable with noodle & chicken, 7+ months	10.40		
	Hipp; Vegetable with rice & chicken, 7+ months	12.40		
	Mumtaz; Potato, lamb and spinach, 4+ months	18.56		
	Mumtaz; Spicy vegetable & chicken, 4+ months	18.15		
	Mumtaz; Vegetable & lamb, 7+ months	22.67		
	Organix; Organic butternut squash & chicken, 4+ months	11.20		
	Organix; Organic fruity chicken with wholegrain rice, 4+ months	17.47		
	Organix; Orgnic pasta stars with bolognese sauce, 7+ months	10.67		
	Plum; Red cabbage with apple & chicken, 7+ months	16.00		
	Plum; Sweet potato with lamb & carrot, 7+ months	12.90		

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared[2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
Infant Milk Formula				
	Aptamil; (Milupa) Breast milk substitute with immunofortis, from birth	11.10	8.20	90.60
	Aptamil; (Milupa) Extra hugry, from birth	18.60	7.40	84.50
	Aptamil; (Milupa) Extra hungry, from birth, ready to drink	2.40		
	Aptamil; (Milupa) Follow-on milk, 6+ months	10.40	11.20	80.90
	Aptamil; (Milupa) Ready to drink, from birth	1.60		
	Aptamil; (Milupa) Follow-on milk, 6+ months, ready to drink	2.50		
	Cow & Gate; Newborn, from birth	1.04	7.10	79.50
	Cow & Gate; Follow-on milk, 6+ months, ready to drink	2.50		
	Cow & Gate; From birth, ready to drink	0.90		
	Cow & Gate; Hungrier baby, from birth, ready to drink	1.90		
	Cow & Gate; 3 Good night milk, 6+ months	17.80	7.90	77.80
	Cow & Gate; Stage 2, ready to drink	2.70		
	Cow & Gate 2; Hungrier baby, from birth	14.90	5.80	76.20
	Heinz; (Farley's) Hungry baby, from birth	15.40	5.60	73.50
	Heinz; (Farley's) Soya formula, from birth	6.80	1.60	7.00
	Heinz; (Farley's) Follow-on milk, growing baby, 6+ months	5.60	1.50	50.00
	Heinz; (nurture) Growing baby, follow-on milk, 6+ months, ready to drink	1.00		
	Heinz; (nurture) Hungrier baby, from birth, ready to drink	0.90		
	Heinz; (nurture) Newborn, from birth	4.00	1.20	52.90
	Heinz; (nurture) Newborn, from birth, ready to drink	1.60		
	SMA; Gold 1, 0-12 months	19.60	7.80	83.20
	SMA; Gold, from birth, ready to drink	2.50		
	SMA; Gold 0-12 months, ready to drink	3.00		
	SMA; Food for special medical purpose, 0-12 months	9.80	2.90	34.60
	SMA; Progress follow-on milk, 3- 6 months	22.40	8.50	85.90

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared[2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
	SMA; Progress follow-on milk, 6-24 months, ready to drink	1.50		
	SMA; Staydown, infant milk for babies with significant reflux, 0-12 months	25.20	7.60	72.80
	SMA; White 2, 0-12 months	16.10	4.90	57.40
	SMA; Wysoy, soya infant formula for cow's milk intolerant babies, 0-12 months	1.40	0.20	0.70
Milk Products				
	Boots; Blueberry, banana and vanilla dessert	12.60		
	Boots; Fruity rice pudding, 7+ months	3.80		
	Boots; Organic banana dessert	4.30		
	Boots; Organic orange and yogurt dessert	6.80		
	Boots; Vanilla custard, 7+ months	3.60		
	Cow & Gate; Raspberry dairy dessert	3.30		
	Heinz; Banana delight, all ages	4.30		
	Heinz; Egg custard, all ages	24.50		
	Heinz; Fruity custard, apple & mango, 4+ months	3.90		
	Hipp; Banana & peach breakfast, 4+ months	37.38	25.00	89.00
	Hipp; Fruit duet (mango & banana with yogurt), 7+ months	17.50		
	Hipp; Strawberry & raspberry yogurt, 7+ months	14.50		
	Muller little stars fruit yogurt	3.60		
	Organix; organic fruity custard (banana & strawberry,milk), 4+ months	5.50		
	Organix; Organic rice pudding (apple & mango), 4+ months,	5.70		
	Yoplait Petit Filous fromage frais fruit flavour	10.00		
Miscellaneous Foods				
	Boots; Apple crumble, 7+ months	3.00		
	Boots; Rice cake (apple), 7+ months	17.40		
	Boots; Rusks	4.80		

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared [2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
	Boots; Tropical juice drink (diluted from concentrate) 65% Fruit, 7+ months, ready to drink	5.60		
	Cow & Gate; Apple & blackcurrant squash, all ages	103.40	16.40	71.20
	Cow & Gate; Apple & orange (diluted fruit drink from concentrate), 74% fruit, 4+ months, ready to drink	5.00		
	Cow & Gate; Apple crumble, 6+ months	8.90		
	Cow & Gate; Berry bear biscuit	4.00		
	Cow & Gate; Juicy fruit crumble	8.90		
	Cow & Gate; Pear & peach squash, all ages	29.92	81.20	138.90
	Cow & Gate; Fruit flavoured juice, ready to drink	5.00		
	Cow & Gate; Summer fruit squash, all ages	89.10	17.00	81.30
	Cow & Gate; Summer fruit (from concentrate) 75% fruit, 4+ months, ready to drink	8.30		
	Ella's Kitchen; Apple and raisin oat crumble	8.90		
	Heinz; Diluted pure juice (red grape & apple) 72% fruit, 4+ months, ready to drink	5.40		
	Heinz; Farley's rusk (original)	38.00		
	Heinz; Organic ginger bread fingers	10.00		
	Heinz; Pure juice apple (concentrated apple juice 100%), 4+ months, ready to drink	8.00		
	Heinz; Pure juice, fruit flavour, ready to drink	6.20		
	Hipp; Good night milk, 6+ months	19.60	10.50	93.80
	Hipp; Little nibbles organic savoury rice cakes	16.30		
	Organix; Baby biscuit	10.00		
	Organix; Organic crunchy sticks (carrot), 7+ months	39.67		
	Organix; Organic milk and vanilla baby cookies	7.40		
	Organix; Organic rice cake (apple), 7+ months	16.33		
	Organix; Organic rice cake (orange), 7+ months	21.90		

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared[2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
	Organix; Organic rice cakes, all varieties	17.00		
	Organix; Soft rusk (orange)	100.00		
	Organix; Soft rusk (original)	28.00		
Drinking Water				
	Boots; Water with a hint of apple, 4+ months	2.50		
	Boots; Water with a hint of blackcurrant, 4+ months	5.40		
	Boots; Water with a hint of fruit	2.20		
	Boots; Water with a hint of peach, 4+ months	2.20		
	Hipp; Mineral water with a splash of apple juice, 4+ months	6.80		
	Hipp; Mineral water with a splash of red grape juice, 4+ months	6.90		
	SPA, Reine natural mineral water, all ages	2.80		
Vegetables Dishes				
	Boots; Carrot & potato, 4+ months	5.00		
	Cow & Gate; Baby cauliflower cheese, 4+ months	12.00		
	Cow & Gate; Broccoli cheese, 10+ months	9.87		
	Cow & Gate; Mild mexican bean pot, 10+ months	18.53		
	Cow & Gate; Sweet potato bake, 4+ months	10.70		
	Annabel Karmel; Eat your greens puree	11.05		
	Ella's Kitchen; Spinach, apple and swede, 4+ months	30.90		
	Ella's Kitchen; Broccoli, pear & peas, 4+ months	9.00		
	Ella's Kitchen; Butternut squash, carrot, apple & prune, 4+ months	10.90		
	Ella's kitchen; Carrot, apple and parsnip	13.47		
	Ella's Kitchen; Sweetcorn pumpkin and peas	17.32		
	Heinz; Caribbean vegetable with fruity rice, 7+ months	18.40		
	Heinz; Cauliflower & broccoli cheese, 4+ months	22.00	13.00	60.00
	Heinz; Cauliflower and broccoli cheese, 4 + months, ready to eat	11.00		

Food group	Food Name	Fluoride content µg/100g [1]	F content (µg/100g) of prepared[2] sample	
			Water F concentration (mg/L)	
			0.13	0.90
	Heinz; Chunky vegetable risotto, 10+ months	13.47		
	Heinz; Creamy vegetable curry, 7+ months	14.93		
	Heinz; Mediterranean vegetable with rice, 4+ months	14.00	20.00	78.00
	Heinz; Medley vegetable & sweet potato, 4+ months	12.90		
	Heinz; Vegetable bake, 7+ months	19.87		
	Hipp; Cauliflower cheese, 4+ months	7.00		
	Hipp; Mixed vegetable medley, 4+ months	4.00		
	Hipp; Squash and sweet potato	4.30		
	Organix; Organic sweetcorn, carrot & pea, 4+ months	7.60		
	Organix; Organic tomato & haricot bean casserole, 4+ months	18.00		
	Organix; Organic vegetable with cheese & rice, 7+ months	7.47		
	Plum; Carrot with lentil & cheddar, 7+ months	10.00		
	Plum; Sweetcorn & carrot, 4+ months	7.00		

Table 3: Tea, infused

NOTES:
i) The fluoride content of each sample was measured based on 3 different batch numbers.
ii) Reference to brand names, commercial products, or companies in this publication is only for the purpose of specifying information and does not indicate recommendation or endorsement over others not stated.

Footnote:
[1.] Infusions of tea samples were prepared by using boiled deionised distilled water (<0.02 ppmF): i.e. one tea bag per cup (200 ml); 1 teaspoon of dry leaves (2.2g) per cup (200 ml); 1 teaspoon instant tea (1.0 g) per cup (200 ml).

Sample description	F content (µg/100ml) of infused[1] sample		
	Infusion time		
	1 minute	10 minutes	60 minutes
Instant tea			
PG Tips Pure Tea Granules	777.95	777.95	777.95
Tetley Pure Tea Granules	990.63	990.63	990.63
Loose tea			
Asda Chosen by You Loose Leaf Tea	241.75	295.86	281.73
Fairtrade Red Label Loose Tea by Sainsbury's	216.16	248.22	265.99
Morrisons Red Label Loose Tea	265.49	310.75	324.64
PG Tips Loose Tea	392.42	478.60	456.33
Tesco Original Loose Leaf Medium Strength Tea	303.46	366.19	427.70
Twinings Original English Breakfast Loose	145.96	186.29	162.43
Typhoo Leaf Tea	188.48	228.65	234.07
Yorkshire Tea Leaf Tea	204.24	250.90	303.23

Sample description	F content (µg/100ml) of infused[1] sample		
	Infusion time		
	1 minute	10 minutes	60 minutes
Tea bag			
Asda Chosen by You Assam	159.14	262.31	273.51
Asda Chosen by You Ceylon	131.74	180.15	206.87
Asda Chosen by You Decaffeinated Tea Bags	294.26	300.47	415.84
Asda Chosen by You Tea Bags	344.14	599.91	632.47
Asda Smart Price Tea Bags	322.99	589.75	839.69
Fairtrade Decaffeinated Red Label by Sainsbury's	271.84	504.52	524.87
Fairtrade Extra Strong Red Label by Sainsbury's	195.67	331.96	362.39
Fairtrade Red Label by Sainsbury's	318.93	408.04	534.20
Lancashire Tea Standard Blend	387.98	526.65	729.81
Morrisons Decaffeinated Tea Bags	315.78	551.94	605.48
Morrisons Extra Strong Tea Bags	295.66	434.07	448.31
Morrisons Red Label Tea Bags	366.59	441.41	604.61
Morrisons Savers Tea Bags	333.13	504.57	533.36
PG Tips	643.19	841.02	895.93
PG Tips Decaffeinated	677.42	927.69	943.61
PG Tips the Fresh One	437.31	684.06	705.79
PG Tips the Strong One	530.79	740.30	763.57
Sainsbury's Basics Fairtrade	431.90	707.34	708.21
Sainsbury's Taste the Difference Earl Grey Fairtrade	365.18	386.26	300.66
Tesco Decaffeinated Medium Strength Tea	303.94	475.41	580.36
Tesco Everyday Value Tea Bags	475.06	778.92	894.54
Tesco Finest Assam	128.48	170.76	188.84
Tesco Original Medium Strength Tea	419.99	640.92	685.92

Sample description	F content (µg/100ml) of infused[1] sample		
	Infusion time		
	1 minute	10 minutes	60 minutes
Tetley Decaffeinated	499.20	768.69	865.81
Tetley Earl Grey	351.17	464.88	508.69
Tetley Extra Strong	212.23	399.78	414.92
Tetley Original	540.22	841.87	840.77
Twinings Assam	106.24	137.68	204.71
Twinings Ceylon	119.81	154.64	169.02
Twinings Original English Breakfast	165.44	323.08	513.66
Twinings the Earl Grey	300.66	451.14	461.25
Twinings the Everyday Tea	297.55	401.67	506.72
Typhoo	464.36	600.53	628.53
Typhoo Decaffeinated	324.62	455.13	533.27
Yorkshire Gold	144.49	194.90	286.26
Yorkshire Tea	215.65	258.47	613.28
Yorkshire Tea Decaffeinated	305.89	771.86	900.75

Appendix 1