



# **Nutrient analysis of fish and fish products**

*Analytical Report*



**Prepared by the Institute of Food Research**

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First published March 2013

Published to DH website, in electronic PDF format only.

<http://www.dh.gov.uk/publications>

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# Executive summary

**The Department of Health undertakes a rolling programme of nutrient analysis surveys to ensure that reliable, up-to-date information on the nutritional value of foods is available for use in conjunction with food consumption data collected in dietary surveys to monitor the nutritional value of the nation's diet. Therefore, these nutrient surveys need to provide a single, robust set of nutrient values that is indicative of the potentially broad choice available to the consumer when selecting any particular type of food. As a result, composite samples made up of a number of different brands have been analysed for this survey rather than samples made up of single brands, and a generic name is given to each composite.**

The aim of this survey was to provide up-to-date nutrient composition data for a range of fish and fish products, reflecting the increasing range of commonly consumed fish and fish products and new species which are growing in popularity (such as pangasius), as well as changes in production methods since fish and fish products were last analysed.

The results from this analytical survey will update and extend the data currently held by the Department of Health<sup>1</sup> and will be incorporated into the nutrient databank that supports dietary surveys and also disseminated via the authoritative UK food composition tables, *McCance and Widdowson's The Composition of Foods*.

This project analysed 56 composite samples that were each made up of between 4 and 15 sub-samples. An additional 6 composites (made up of between 3 and 6 sub-samples) were investigated for weight loss on cooking only. Samples were purchased from retail outlets and prepared for analysis between November 2010 and February 2011.

This analytical report gives results for each of the 56 composite samples analysed. Results for individual fatty acids are reported separately in electronic format. Details of sampling procedures and the results of investigations on the additional 6 composites for weight loss on cooking are contained in a separate report.

# Methods

A list of composite samples to be analysed was determined by reviewing consumption and market share, including consideration of fish for which the market is growing. Consumption was determined based on data from year 1 of the National Diet and Nutrition Survey Rolling Programme and market share information was provided by Seafish UK. Availability and applicability of existing analytical data and data from recent surveys in the Nordic countries was also considered. The composite list was finalised following consultation with expert users of the data (including representatives from the food industry, academia, catering suppliers, nutritionists and dietitians). Market share information was then used (where available), and industry consulted, to determine which sub-samples were included within each composite sample. Analysis of langoustine was funded by the Shellfish Association of Great Britain.

Food samples were purchased from retail outlets in the Norwich area and were prepared for analysis between November 2010 and February 2011. The retail outlets included supermarkets, independent retailers and catering suppliers. Food samples were combined into 56 composite samples for analysis. Each composite was made up of between 4 and 15 sub-samples, combined on an equal weight basis. This process allows a single, robust set of nutrient values to be derived for each product type, covering an appropriate cross-section of products available. Samples requiring preparation/cooking were prepared using normal domestic practices and in accordance with manufacturers' instructions. A full list of the composite food samples analysed is given on page 8.

# Composite sample list

Full details of sub-samples are in the project sampling report, available as a separate document. This table lists the 56 composite samples prepared and analysed.

Sample Number	Sample Name	Description
1	Cod, raw, flesh only	11 samples, 11 products, frozen and chilled
2	Cod, baked, flesh only	11 samples, 11 products, frozen and chilled
3	Cod, microwaved, flesh only	11 samples, 11 products, frozen and chilled
4	Haddock, raw, flesh only	11 samples, 11 products, frozen and chilled
5	Haddock, grilled, flesh only	11 samples, 11 products, frozen and chilled
6	Haddock, steamed, flesh only	11 samples, 11 products, frozen and chilled
7	Alaskan pollock, raw, flesh only	9 samples, 8 products, frozen and chilled
8	Sole, raw, flesh only	7 samples, 6 products, frozen and chilled
9	Sole, grilled, flesh only	7 samples, 6 products, frozen and chilled
10	Plaice, raw, flesh only	10 samples, 9 products, frozen and chilled
11	Pangasius, raw, flesh only	6 samples, 6 products, frozen and chilled
12	Coley, raw, flesh only	8 samples, 8 products, frozen and chilled
13	Sea bass, raw, flesh only	10 samples, 10 products, frozen and chilled
14	Sea bass, baked, flesh only	10 samples, 10 products, frozen and chilled
15	Prawns, cold-water ( <i>Pandalus borealis</i> ), purchased cooked	15 samples, 15 products
16	Prawns, king, warm-water ( <i>Penaeus vannamei</i> ), raw	9 samples, 9 products, frozen and chilled
17	Prawns, king, warm-water ( <i>Penaeus vannamei</i> ), grilled from raw	9 samples, 9 products, frozen and chilled

## Nutrient analysis of fish and fish products

18	Prawns, king, warm-water (Penaeus vannamei), purchased cooked	11 samples, 11 products
19	Mussels, purchased cooked	7 samples, 6 products
20	Crab, brown meat, purchased cooked	7 samples, 6 products
21	Crab, white meat, purchased cooked	7 samples, 6 products
22	Mackerel, raw, flesh only	7 samples, 7 products, frozen and chilled
23	Mackerel, grilled, flesh only	7 samples, 7 products, frozen and chilled
24	Trout, rainbow, raw, flesh only	9 samples, 9 products, frozen and chilled
25	Trout, rainbow, baked, flesh only	9 samples, 9 products, frozen and chilled
26	Kippers (analysed without butter), grilled, flesh only	7 samples, 7 products, frozen and chilled
27	Kippers, boil in the bag, with butter, cooked	9 samples, 7 products, frozen and chilled
28	Tuna, raw, flesh only	9 samples, 9 products, frozen and chilled
29	Tuna, baked, flesh only	9 samples, 9 products, frozen and chilled
30	Sardines, raw, flesh only	6 samples, 5 products, frozen and chilled
31	Haddock, smoked, poached	10 samples, 10 products, frozen and chilled
32	Plaice, coated in breadcrumbs, baked	6 samples, 6 products
33	Calamari, coated in batter, baked	5 samples, 2 products
34	Fish fingers, cod, grilled/baked	10 samples, 7 products
35	Fish fingers, cod, fried	10 samples, 7 products
36	Fish fingers, salmon, grilled/baked	5 samples, 2 products
37	Cod, coated in batter, fried	10 samples, 8 products
38	Fishcakes, white fish, coated in breadcrumbs, baked	12 samples, 12 products

## Nutrient analysis of fish and fish products

39	Fishcakes, salmon, coated in breadcrumbs, baked	8 samples, 8 products
40	Scampi, coated in breadcrumbs, baked	11 samples, 11 products
41	Scampi, coated in breadcrumbs, fried	11 samples, 11 products
42	Fish pie, white fish, retail, baked	9 samples, 9 products
43	Mussels in white wine sauce, cooked	6 samples, 6 products
44	Salmon, smoked (cold-smoked)	11 samples, 11 products
45	Salmon, smoked (hot-smoked)	7 samples, 7 products
46	Mackerel, smoked	11 samples, 11 products
47	Seafood sticks	8 samples, 7 products
48	Tuna, canned in brine	11 samples, 10 products
49	Tuna, canned in sunflower oil	11 samples, 10 products
50	Salmon, red, canned	10 samples, 10 products
51	Salmon, red, canned, skinless and boneless	4 samples, 3 products
52	Salmon, pink, canned	9 samples, 7 products
53	Mackerel, canned in brine	4 samples, 3 products
54	Sardines, canned in tomato sauce, whole contents	9 samples, 8 products
55	Sardines, canned in brine	6 samples, 5 products
56	Langoustine, boiled	Small, medium and large from 3 fishing areas

# Analysis and Results

## Notes Relating to Analysis

- Available carbohydrate, starch, total sugars and individual sugars are reported as monosaccharide equivalents. The following factors were used to convert from carbohydrate weights to monosaccharide equivalents.

- Monosaccharides: no conversion
- Disaccharides: x 1.05
- Oligosaccharides
  - Trisaccharides x 1.07
  - Tetrasaccharides x 1.08
  - Pentasaccharides x 1.09
- Starch: x 1.10

- Total carbohydrate was reported as 'available carbohydrate' calculated from the sum of free sugars (glucose, fructose, sucrose, maltose, lactose, galactose and oligosaccharides) and complex carbohydrates (dextrins, starch)
- Protein is calculated from total nitrogen using the nitrogen conversion factors shown.
- The values given for fat refer to total fat and not just triglycerides
- Metabolisable energy is given in kilocalories (kcal) and kilojoules (kJ). These values have been calculated from protein, fat and carbohydrate using the following energy conversion factors:

	kcal/g	kJ/g
	4	17
	9	37
	3.75	16

- Saturated, cis-monounsaturated, cis-polyunsaturated, and trans fatty acids have been calculated from summations of individual fatty acids and are shown as g/100g food. A conversion factor has been used to allow for the non-triglyceride fraction of the lipid and

## Nutrient analysis of fish and fish products

calculate fatty acids g/100g food from g/100g fatty acid methyl esters. The conversion factors used depend on the main fat source of the food and are taken from the tables given in the 6th Summary edition of McCance and Widdowson's The Composition of Foods

- Results for individual fatty acids are available separately in electronic format.
- Total vitamin A is calculated as retinol equivalents and is equal to all-trans retinol + (beta-carotene equivalents/6)
- Retinol is calculated as all trans retinol + (0.75 x 13-cis retinol)
- Total carotene is expressed as beta-carotene equivalents and is calculated as beta-carotene + (alpha-carotene + beta-cryptoxanthin)/2
- Beta-carotene is expressed as the sum of trans and cis-beta carotene
- Total vitamin D is calculated as vitamin D3 + (25OH vitamin D3 \* 5)
- Total vitamin E is expressed as a-tocopherol equivalents and is calculated using the following conversion factors for vitamin E activity:

$\alpha$ -tocopherol	x	1.00
$\beta$ -tocopherol	x	0.40
$\delta$ -tocopherol	x	0.01
$\gamma$ -tocopherol	x	0.10
$\alpha$ -tocotrienol	x	0.30
$\beta$ -tocotrienol	X	0.05
$\gamma$ -tocotrienol	x	0.01
- Some values are reported as '<' meaning that the result was below the analytical limit of quantification (LOQ) or limit of detection (LOD). There is no distinction between '<' and 'not detected'
- Proximate analysis and analysis of individual fatty acids was performed by Eurofins laboratories between March and June 2011. Analysis of inorganics and vitamins was performed by LGC between March and July 2011.

### Evaluation of Data

Values provided by analytical laboratories were compiled in Excel spreadsheets for data evaluation. Where possible, analytical values were compared to other sources of comparable data. Sources used included UK Food Composition tables, other food composition tables and information from manufacturers and retailers. Where applicable, ingredients lists were also evaluated to check that the values reported corresponded to the ingredients included in the samples. Where analytical values appeared incorrect or questionable, data was checked against original laboratory reports and re-analysed if necessary.

Results for all composite samples are given below:

Fish and fish products survey: Analytical Results

Sample 1: Cod, raw, flesh only

**PROXIMATES**

Water	81.6	g/100g
Total Nitrogen	2.80	g/100g
Nitrogen conversion factor	6.25	
Protein	17.5	g/100g
Fat	0.6	g/100g
Ash	1.1	g/100g
Energy (kcal)	75	
Energy (kJ)	320	
Cholesterol	52	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.16	g/100g
cis-monounsaturated	0.14	g/100g
cis n-3 polyunsaturated	0.08	g/100g
cis n-6 polyunsaturated	0.03	g/100g
cis polyunsaturated	0.11	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	91	mg/100g
Potassium (K)	322	mg/100g
Calcium (Ca)	12	mg/100g
Magnesium (Mg)	25	mg/100g
Phosphorus (P)	169	mg/100g
Iron (Fe)	0.10	mg/100g
Copper (Cu)	0.02	mg/100g
Zinc (Zn)	0.34	mg/100g
Chloride (Cl)	165	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	196	µg/100g
Selenium (Se)	23	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.06	mg/100g
Riboflavin	0.08	mg/100g
Niacin	2.3	mg/100g
Tryptophan/60	2.6	mg/100g
Vitamin B <sub>6</sub>	0.14	mg/100g
Vitamin B <sub>12</sub>	1.45	µg/100g
Folate	7	µg/100g
Pantothenic acid	0.25	mg/100g
Biotin	1.3	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	2	µg/100g
Beta - carotene		µg/100g
Total vitamin A	2	Ret Equiv
Vitamin D <sub>3</sub>	<0.1	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	<0.1	µg/100g
Vitamin E	0.66	mg/100g

Sample 2: Cod, baked, flesh only

**PROXIMATES**

Water	76.9	g/100g
Total Nitrogen	3.82	g/100g
Nitrogen conversion factor	6.25	
Protein	23.9	g/100g
Fat	0.5	g/100g
Ash	1.2	g/100g
Energy (kcal)	100	
Energy (kJ)	425	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.12	g/100g
cis-monounsaturated	0.08	g/100g
cis n-3 polyunsaturated	0.13	g/100g
cis n-6 polyunsaturated	0.02	g/100g
cis polyunsaturated	0.16	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	91	mg/100g
Potassium (K)	367	mg/100g
Calcium (Ca)	18	mg/100g
Magnesium (Mg)	30	mg/100g
Phosphorus (P)	189	mg/100g
Iron (Fe)	0.15	mg/100g
Copper (Cu)	0.02	mg/100g
Zinc (Zn)	0.57	mg/100g
Chloride (Cl)	130	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	161	µg/100g
Selenium (Se)	44	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.10	mg/100g
Riboflavin	0.09	mg/100g
Niacin	2.0	mg/100g
Tryptophan/60	4.0	mg/100g
Vitamin B <sub>6</sub>	0.12	mg/100g
Vitamin B <sub>12</sub>	1.91	µg/100g
Folate	8	µg/100g
Pantothenic acid	0.30	mg/100g
Biotin	0.9	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	2	µg/100g
Beta - carotene		µg/100g
Total vitamin A	2	Ret Equiv
Vitamin D <sub>3</sub>	<0.1	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	<0.1	µg/100g
Vitamin E	0.95	mg/100g

Sample 3: Cod, microwaved, flesh only

**PROXIMATES**

Water	77.2	g/100g
Total Nitrogen	3.76	g/100g
Nitrogen conversion factor	6.25	
Protein	23.5	g/100g
Fat	0.4	g/100g
Ash	1.2	g/100g
Energy (kcal)	98	
Energy (kJ)	414	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.08	g/100g
cis-monounsaturated	0.08	g/100g
cis n-3 polyunsaturated	0.09	g/100g
cis n-6 polyunsaturated	0.02	g/100g
cis polyunsaturated	0.11	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	108	mg/100g
Potassium (K)	427	mg/100g
Calcium (Ca)	16	mg/100g
Magnesium (Mg)	32	mg/100g
Phosphorus (P)	216	mg/100g
Iron (Fe)	0.16	mg/100g
Copper (Cu)	0.02	mg/100g
Zinc (Zn)	0.53	mg/100g
Chloride (Cl)	168	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	44	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.08	mg/100g
Riboflavin	0.10	mg/100g
Niacin	1.8	mg/100g
Tryptophan/60	3.7	mg/100g
Vitamin B <sub>6</sub>	0.13	mg/100g
Vitamin B <sub>12</sub>	2.19	µg/100g
Folate	8	µg/100g
Pantothenic acid	0.28	mg/100g
Biotin	0.7	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.86	mg/100g

Sample 4: Haddock, raw, flesh only

**PROXIMATES**

Water	81.7	g/100g
Total Nitrogen	2.85	g/100g
Nitrogen conversion factor	6.25	
Protein	17.8	g/100g
Fat	0.4	g/100g
Ash	1.0	g/100g
Energy (kcal)	75	
Energy (kJ)	317	
Cholesterol	49	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.09	g/100g
cis-monounsaturated	0.08	g/100g
cis n-3 polyunsaturated	0.09	g/100g
cis n-6 polyunsaturated	0.01	g/100g
cis polyunsaturated	0.10	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	68	mg/100g
Potassium (K)	315	mg/100g
Calcium (Ca)	11	mg/100g
Magnesium (Mg)	25	mg/100g
Phosphorus (P)	163	mg/100g
Iron (Fe)	0.12	mg/100g
Copper (Cu)	0.02	mg/100g
Zinc (Zn)	0.31	mg/100g
Chloride (Cl)	110	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	320	µg/100g
Selenium (Se)	34	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.13	mg/100g
Riboflavin	0.15	mg/100g
Niacin	4.9	mg/100g
Tryptophan/60	3.1	mg/100g
Vitamin B <sub>6</sub>	0.29	mg/100g
Vitamin B <sub>12</sub>	1.90	µg/100g
Folate	10	µg/100g
Pantothenic acid	0.27	mg/100g
Biotin	2.0	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	1	µg/100g
Beta - carotene		µg/100g
Total vitamin A	1	Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.49	mg/100g

Sample 5: Haddock, grilled, flesh only

**PROXIMATES**

Water	75.9	g/100g
Total Nitrogen	3.82	g/100g
Nitrogen conversion factor	6.25	
Protein	23.9	g/100g
Fat	0.3	g/100g
Ash	1.3	g/100g
Energy (kcal)	98	
Energy (kJ)	417	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.06	g/100g
cis-monounsaturated	0.05	g/100g
cis n-3 polyunsaturated	0.10	g/100g
cis n-6 polyunsaturated	0.01	g/100g
cis polyunsaturated	0.11	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	92	mg/100g
Potassium (K)	433	mg/100g
Calcium (Ca)	20	mg/100g
Magnesium (Mg)	33	mg/100g
Phosphorus (P)	232	mg/100g
Iron (Fe)	0.17	mg/100g
Copper (Cu)	0.02	mg/100g
Zinc (Zn)	0.50	mg/100g
Chloride (Cl)	130	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	48	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.09	mg/100g
Riboflavin	0.14	mg/100g
Niacin	4.0	mg/100g
Tryptophan/60	4.3	mg/100g
Vitamin B <sub>6</sub>	0.29	mg/100g
Vitamin B <sub>12</sub>	2.37	µg/100g
Folate	6	µg/100g
Pantothenic acid	0.28	mg/100g
Biotin	1.7	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.52	mg/100g

Sample 6: Haddock, steamed, flesh only

**PROXIMATES**

Water	78.2	g/100g
Total Nitrogen	3.49	g/100g
Nitrogen conversion factor	6.25	
Protein	21.8	g/100g
Fat	0.6	g/100g
Ash	1.3	g/100g
Energy (kcal)	93	
Energy (kJ)	393	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.12	g/100g
cis-monounsaturated	0.09	g/100g
cis n-3 polyunsaturated	0.19	g/100g
cis n-6 polyunsaturated	0.02	g/100g
cis polyunsaturated	0.22	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	84	mg/100g
Potassium (K)	376	mg/100g
Calcium (Ca)	14	mg/100g
Magnesium (Mg)	28	mg/100g
Phosphorus (P)	199	mg/100g
Iron (Fe)	0.16	mg/100g
Copper (Cu)	0.03	mg/100g
Zinc (Zn)	0.42	mg/100g
Chloride (Cl)	120	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	51	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.07	mg/100g
Riboflavin	0.11	mg/100g
Niacin	3.9	mg/100g
Tryptophan/60	4.1	mg/100g
Vitamin B <sub>6</sub>	0.24	mg/100g
Vitamin B <sub>12</sub>	2.14	µg/100g
Folate	9	µg/100g
Pantothenic acid	0.29	mg/100g
Biotin	1.6	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.57	mg/100g

Sample 7: Alaskan pollock, raw, flesh only

**PROXIMATES**

Water	83.7	g/100g
Total Nitrogen	2.62	g/100g
Nitrogen conversion factor	6.25	
Protein	16.4	g/100g
Fat	0.7	g/100g
Ash	0.8	g/100g
Energy (kcal)	72	
Energy (kJ)	305	
Cholesterol	49	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.14	g/100g
cis-monounsaturated	0.17	g/100g
cis n-3 polyunsaturated	0.14	g/100g
cis n-6 polyunsaturated	0.01	g/100g
cis polyunsaturated	0.16	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	68	mg/100g
Potassium (K)	216	mg/100g
Calcium (Ca)	12	mg/100g
Magnesium (Mg)	30	mg/100g
Phosphorus (P)	120	mg/100g
Iron (Fe)	0.18	mg/100g
Copper (Cu)	0.03	mg/100g
Zinc (Zn)	0.39	mg/100g
Chloride (Cl)	100	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	56	µg/100g
Selenium (Se)	27	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.03	mg/100g
Riboflavin	0.09	mg/100g
Niacin	2.6	mg/100g
Tryptophan/60	2.6	mg/100g
Vitamin B <sub>6</sub>	0.04	mg/100g
Vitamin B <sub>12</sub>	2.32	µg/100g
Folate	5	µg/100g
Pantothenic acid	0.22	mg/100g
Biotin	1.3	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.60	mg/100g

Sample 8: Sole, raw, flesh only

**PROXIMATES**

Water	82.7	g/100g
Total Nitrogen	2.67	g/100g
Nitrogen conversion factor	6.25	
Protein	16.7	g/100g
Fat	0.7	g/100g
Ash	0.9	g/100g
Energy (kcal)	73	
Energy (kJ)	310	
Cholesterol	47	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.16	g/100g
cis-monounsaturated	0.14	g/100g
cis n-3 polyunsaturated	0.14	g/100g
cis n-6 polyunsaturated	0.02	g/100g
cis polyunsaturated	0.16	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	115	mg/100g
Potassium (K)	177	mg/100g
Calcium (Ca)	17	mg/100g
Magnesium (Mg)	26	mg/100g
Phosphorus (P)	124	mg/100g
Iron (Fe)	0.12	mg/100g
Copper (Cu)	<0.01	mg/100g
Zinc (Zn)	0.31	mg/100g
Chloride (Cl)	178	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	23	µg/100g
Selenium (Se)	50	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.15	mg/100g
Riboflavin	0.08	mg/100g
Niacin	4.3	mg/100g
Tryptophan/60	2.5	mg/100g
Vitamin B <sub>6</sub>	0.15	mg/100g
Vitamin B <sub>12</sub>	1.01	µg/100g
Folate	13	µg/100g
Pantothenic acid	0.30	mg/100g
Biotin	4.3	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.73	mg/100g

Sample 9: Sole, grilled, flesh only

**PROXIMATES**

Water	76.8	g/100g
Total Nitrogen	3.44	g/100g
Nitrogen conversion factor	6.25	
Protein	21.5	g/100g
Fat	0.6	g/100g
Ash	1.1	g/100g
Energy (kcal)	91	
Energy (kJ)	388	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.16	g/100g
cis-monounsaturated	0.08	g/100g
cis n-3 polyunsaturated	0.13	g/100g
cis n-6 polyunsaturated	0.02	g/100g
cis polyunsaturated	0.16	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	151	mg/100g
Potassium (K)	260	mg/100g
Calcium (Ca)	28	mg/100g
Magnesium (Mg)	26	mg/100g
Phosphorus (P)	163	mg/100g
Iron (Fe)	0.50	mg/100g
Copper (Cu)	0.01	mg/100g
Zinc (Zn)	0.45	mg/100g
Chloride (Cl)	160	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	83	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.12	mg/100g
Riboflavin	0.10	mg/100g
Niacin	3.7	mg/100g
Tryptophan/60	3.9	mg/100g
Vitamin B <sub>6</sub>	0.13	mg/100g
Vitamin B <sub>12</sub>	1.14	µg/100g
Folate	10	µg/100g
Pantothenic acid	0.29	mg/100g
Biotin	4.5	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.85	mg/100g

Sample 10: Plaice, raw, flesh only

**PROXIMATES**

Water	80.4	g/100g
Total Nitrogen	2.62	g/100g
Nitrogen conversion factor	6.25	
Protein	16.4	g/100g
Fat	1.2	g/100g
Ash	1.0	g/100g
Energy (kcal)	76	
Energy (kJ)	323	
Cholesterol	66	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.22	g/100g
cis-monounsaturated	0.25	g/100g
cis n-3 polyunsaturated	0.22	g/100g
cis n-6 polyunsaturated	0.03	g/100g
cis polyunsaturated	0.25	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	147	mg/100g
Potassium (K)	226	mg/100g
Calcium (Ca)	17	mg/100g
Magnesium (Mg)	21	mg/100g
Phosphorus (P)	157	mg/100g
Iron (Fe)	0.10	mg/100g
Copper (Cu)	0.01	mg/100g
Zinc (Zn)	0.45	mg/100g
Chloride (Cl)	180	mg/100g
Manganese (Mn)	<0.01	mg/100g
Iodine (I)	31	µg/100g
Selenium (Se)	35	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.33	mg/100g
Riboflavin	0.14	mg/100g
Niacin	2.5	mg/100g
Tryptophan/60	3.0	mg/100g
Vitamin B <sub>6</sub>	0.23	mg/100g
Vitamin B <sub>12</sub>	1.30	µg/100g
Folate	12	µg/100g
Pantothenic acid	0.77	mg/100g
Biotin	35.5	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.57	mg/100g

Sample 11: Pangasius, raw, flesh only

**PROXIMATES**

Water	83.7	g/100g
Total Nitrogen	2.38	g/100g
Nitrogen conversion factor	6.25	
Protein	14.9	g/100g
Fat	1.6	g/100g
Ash	1.2	g/100g
Energy (kcal)	74	
Energy (kJ)	313	
Cholesterol	36	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.49	g/100g
cis-monounsaturated	0.44	g/100g
cis n-3 polyunsaturated	0.02	g/100g
cis n-6 polyunsaturated	0.15	g/100g
cis polyunsaturated	0.17	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	204	mg/100g
Potassium (K)	293	mg/100g
Calcium (Ca)	10	mg/100g
Magnesium (Mg)	29	mg/100g
Phosphorus (P)	166	mg/100g
Iron (Fe)	0.09	mg/100g
Copper (Cu)	0.02	mg/100g
Zinc (Zn)	0.32	mg/100g
Chloride (Cl)	190	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	3	µg/100g
Selenium (Se)	18	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.02	mg/100g
Riboflavin	0.06	mg/100g
Niacin	6.3	mg/100g
Tryptophan/60	3.5	mg/100g
Vitamin B <sub>6</sub>	0.12	mg/100g
Vitamin B <sub>12</sub>	1.05	µg/100g
Folate	10	µg/100g
Pantothenic acid	0.66	mg/100g
Biotin	37.9	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	<0.1	µg/100g
Beta - carotene		µg/100g
Total vitamin A	<0.1	Ret Equiv
Vitamin D <sub>3</sub>	1.35	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	1.35	µg/100g
Vitamin E	0.23	mg/100g

Sample 12: Coley, raw, flesh only

**PROXIMATES**

Water	81.9	g/100g
Total Nitrogen	2.88	g/100g
Nitrogen conversion factor	6.25	
Protein	18.0	g/100g
Fat	1.1	g/100g
Ash	1.2	g/100g
Energy (kcal)	82	
Energy (kJ)	347	
Cholesterol	47	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.20	g/100g
cis-monounsaturated	0.26	g/100g
cis n-3 polyunsaturated	0.25	g/100g
cis n-6 polyunsaturated	0.02	g/100g
cis polyunsaturated	0.27	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	68	mg/100g
Potassium (K)	303	mg/100g
Calcium (Ca)	7	mg/100g
Magnesium (Mg)	32	mg/100g
Phosphorus (P)	171	mg/100g
Iron (Fe)	0.27	mg/100g
Copper (Cu)	0.04	mg/100g
Zinc (Zn)	0.43	mg/100g
Chloride (Cl)	130	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	111	µg/100g
Selenium (Se)	33	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.23	mg/100g
Riboflavin	0.17	mg/100g
Niacin	2.6	mg/100g
Tryptophan/60	3.7	mg/100g
Vitamin B <sub>6</sub>	0.27	mg/100g
Vitamin B <sub>12</sub>	3.48	µg/100g
Folate	5	µg/100g
Pantothenic acid	0.33	mg/100g
Biotin	3.7	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.57	mg/100g

Sample 13: Sea bass, raw, flesh only

**PROXIMATES**

Water	69.4	g/100g
Total Nitrogen	3.20	g/100g
Nitrogen conversion factor	6.25	
Protein	20.0	g/100g
Fat	9.8	g/100g
Ash	1.1	g/100g
Energy (kcal)	168	
Energy (kJ)	703	
Cholesterol	71	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	2.16	g/100g
cis-monounsaturated	3.40	g/100g
cis n-3 polyunsaturated	1.71	g/100g
cis n-6 polyunsaturated	1.20	g/100g
cis polyunsaturated	2.91	g/100g
Trans	0.02	g/100g

**INORGANICS**

Sodium (Na)	72	mg/100g
Potassium (K)	370	mg/100g
Calcium (Ca)	14	mg/100g
Magnesium (Mg)	30	mg/100g
Phosphorus (P)	202	mg/100g
Iron (Fe)	0.27	mg/100g
Copper (Cu)	0.04	mg/100g
Zinc (Zn)	0.62	mg/100g
Chloride (Cl)	90	mg/100g
Manganese (Mn)	0.02	mg/100g
Iodine (I)	8	µg/100g
Selenium (Se)	29	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.39	mg/100g
Riboflavin	0.20	mg/100g
Niacin	3.0	mg/100g
Tryptophan/60	4.4	mg/100g
Vitamin B <sub>6</sub>	0.37	mg/100g
Vitamin B <sub>12</sub>	3.01	µg/100g
Folate	5	µg/100g
Pantothenic acid	0.73	mg/100g
Biotin	2.5	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	34	µg/100g
Beta - carotene		µg/100g
Total vitamin A	34	Ret Equiv
Vitamin D <sub>3</sub>	<0.1	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	<0.1	µg/100g
Vitamin E	0.48	mg/100g

Sample 14: Sea bass, baked, flesh only

**PROXIMATES**

Water	69.0	g/100g
Total Nitrogen	3.71	g/100g
Nitrogen conversion factor	6.25	
Protein	23.2	g/100g
Fat	6.8	g/100g
Ash	1.2	g/100g
Energy (kcal)	154	
Energy (kJ)	646	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	1.47	g/100g
cis-monounsaturated	2.29	g/100g
cis n-3 polyunsaturated	1.23	g/100g
cis n-6 polyunsaturated	0.85	g/100g
cis polyunsaturated	2.09	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	80	mg/100g
Potassium (K)	390	mg/100g
Calcium (Ca)	31	mg/100g
Magnesium (Mg)	35	mg/100g
Phosphorus (P)	231	mg/100g
Iron (Fe)	0.27	mg/100g
Copper (Cu)	0.04	mg/100g
Zinc (Zn)	0.75	mg/100g
Chloride (Cl)	100	mg/100g
Manganese (Mn)	0.03	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	24	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.19	mg/100g
Riboflavin	0.18	mg/100g
Niacin	2.6	mg/100g
Tryptophan/60	4.9	mg/100g
Vitamin B <sub>6</sub>	0.14	mg/100g
Vitamin B <sub>12</sub>	2.91	µg/100g
Folate	4	µg/100g
Pantothenic acid	0.63	mg/100g
Biotin	2.5	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E		mg/100g

Sample 15: Prawns, cold-water (*Pandalus borealis*), purchased cooked

**PROXIMATES**

Water	84.0	g/100g
Total Nitrogen	2.46	g/100g
Nitrogen conversion factor	6.25	
Protein	15.4	g/100g
Fat	0.9	g/100g
Ash	2.0	g/100g
Energy (kcal)	70	
Energy (kJ)	295	
Cholesterol	143	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.15	g/100g
cis-monounsaturated	0.19	g/100g
cis n-3 polyunsaturated	0.20	g/100g
cis n-6 polyunsaturated	0.02	g/100g
cis polyunsaturated	0.22	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	588	mg/100g
Potassium (K)	74	mg/100g
Calcium (Ca)	65	mg/100g
Magnesium (Mg)	36	mg/100g
Phosphorus (P)	127	mg/100g
Iron (Fe)	1.00	mg/100g
Copper (Cu)	0.28	mg/100g
Zinc (Zn)	1.02	mg/100g
Chloride (Cl)	770	mg/100g
Manganese (Mn)	0.02	mg/100g
Iodine (I)	13	µg/100g
Selenium (Se)	30	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	<0.01	mg/100g
Riboflavin	0.05	mg/100g
Niacin	<0.1	mg/100g
Tryptophan/60	3.6	mg/100g
Vitamin B <sub>6</sub>	0.03	mg/100g
Vitamin B <sub>12</sub>	2.35	µg/100g
Folate	10	µg/100g
Pantothenic acid	0.14	mg/100g
Biotin	4.0	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	<0.1	µg/100g
Beta - carotene		µg/100g
Total vitamin A	<0.1	Ret Equiv
Vitamin D <sub>3</sub>	<0.1	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	<0.1	µg/100g
Vitamin E	3.63	mg/100g

Sample 16: Prawns, king, warm-water (*Penaeus vannamei*), raw

**PROXIMATES**

Water	81.9	g/100g
Total Nitrogen	2.82	g/100g
Nitrogen conversion factor	6.25	
Protein	17.6	g/100g
Fat	0.7	g/100g
Ash	1.0	g/100g
Energy (kcal)	77	
Energy (kJ)	325	
Cholesterol	150	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.17	g/100g
cis-monounsaturated	0.08	g/100g
cis n-3 polyunsaturated	0.12	g/100g
cis n-6 polyunsaturated	0.09	g/100g
cis polyunsaturated	0.22	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	215	mg/100g
Potassium (K)	126	mg/100g
Calcium (Ca)	44	mg/100g
Magnesium (Mg)	28	mg/100g
Phosphorus (P)	155	mg/100g
Iron (Fe)	0.70	mg/100g
Copper (Cu)	0.21	mg/100g
Zinc (Zn)	1.16	mg/100g
Chloride (Cl)	260	mg/100g
Manganese (Mn)	0.04	mg/100g
Iodine (I)	5	µg/100g
Selenium (Se)	34	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	<0.01	mg/100g
Riboflavin	0.05	mg/100g
Niacin	0.1	mg/100g
Tryptophan/60	3.6	mg/100g
Vitamin B <sub>6</sub>	0.11	mg/100g
Vitamin B <sub>12</sub>	1.26	µg/100g
Folate	11	µg/100g
Pantothenic acid	0.16	mg/100g
Biotin	3.9	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	<0.1	µg/100g
Beta - carotene		µg/100g
Total vitamin A	<0.1	Ret Equiv
Vitamin D <sub>3</sub>	<0.1	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	<0.1	µg/100g
Vitamin E	1.80	mg/100g

Sample 17: Prawns, king, warm-water (*Penaeus vannamei*), grilled from raw

**PROXIMATES**

Water	73.8	g/100g
Total Nitrogen	3.76	g/100g
Nitrogen conversion factor	6.25	
Protein	23.5	g/100g
Fat	0.9	g/100g
Ash	1.3	g/100g
Energy (kcal)	102	
Energy (kJ)	433	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.20	g/100g
cis-monounsaturated	0.10	g/100g
cis n-3 polyunsaturated	0.14	g/100g
cis n-6 polyunsaturated	0.11	g/100g
cis polyunsaturated	0.25	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	305	mg/100g
Potassium (K)	181	mg/100g
Calcium (Ca)	59	mg/100g
Magnesium (Mg)	37	mg/100g
Phosphorus (P)	209	mg/100g
Iron (Fe)	0.43	mg/100g
Copper (Cu)	0.35	mg/100g
Zinc (Zn)	1.58	mg/100g
Chloride (Cl)	310	mg/100g
Manganese (Mn)	0.05	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	41	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin		mg/100g
Riboflavin		mg/100g
Niacin		mg/100g
Tryptophan/60		mg/100g
Vitamin B <sub>6</sub>		mg/100g
Vitamin B <sub>12</sub>		µg/100g
Folate		µg/100g
Pantothenic acid		mg/100g
Biotin		µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E		mg/100g

Sample 18: Prawns, king, warm-water (*Penaeus vannamei*), purchased cooked

**PROXIMATES**

Water	82.4	g/100g
Total Nitrogen	2.59	g/100g
Nitrogen conversion factor	6.25	
Protein	16.2	g/100g
Fat	0.4	g/100g
Ash	1.9	g/100g
Energy (kcal)	68	
Energy (kJ)	290	
Cholesterol	162	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.10	g/100g
cis-monounsaturated	0.05	g/100g
cis n-3 polyunsaturated	0.07	g/100g
cis n-6 polyunsaturated	0.05	g/100g
cis polyunsaturated	0.13	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	643	mg/100g
Potassium (K)	65	mg/100g
Calcium (Ca)	49	mg/100g
Magnesium (Mg)	21	mg/100g
Phosphorus (P)	125	mg/100g
Iron (Fe)	0.27	mg/100g
Copper (Cu)	0.23	mg/100g
Zinc (Zn)	1.04	mg/100g
Chloride (Cl)	740	mg/100g
Manganese (Mn)	0.03	mg/100g
Iodine (I)	12	µg/100g
Selenium (Se)	30	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	<0.01	mg/100g
Riboflavin	0.05	mg/100g
Niacin	0.1	mg/100g
Tryptophan/60	3.4	mg/100g
Vitamin B <sub>6</sub>	0.05	mg/100g
Vitamin B <sub>12</sub>	1.40	µg/100g
Folate	10	µg/100g
Pantothenic acid	0.20	mg/100g
Biotin	4.3	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	<0.1	µg/100g
Beta - carotene		µg/100g
Total vitamin A	<0.1	Ret Equiv
Vitamin D <sub>3</sub>	<0.1	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	<0.1	µg/100g
Vitamin E	1.64	mg/100g

Sample 19: Mussels, purchased cooked

**PROXIMATES**

Water	75.5	g/100g
Total Nitrogen	2.83	g/100g
Nitrogen conversion factor	6.25	
Protein	17.7	g/100g
Fat	2.2	g/100g
Ash	1.8	g/100g
<sup>1</sup> Energy (kcal)	104	
<sup>1</sup> Energy (kJ)	438	
Cholesterol	45	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.34	g/100g
cis-monounsaturated	0.26	g/100g
cis n-3 polyunsaturated	0.54	g/100g
cis n-6 polyunsaturated	0.08	g/100g
cis polyunsaturated	0.62	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	401	mg/100g
Potassium (K)	116	mg/100g
Calcium (Ca)	40	mg/100g
Magnesium (Mg)	50	mg/100g
Phosphorus (P)	258	mg/100g
Iron (Fe)	3.25	mg/100g
Copper (Cu)	0.17	mg/100g
Zinc (Zn)	3.39	mg/100g
Chloride (Cl)	700	mg/100g
Manganese (Mn)	0.18	mg/100g
Iodine (I)	247	µg/100g
Selenium (Se)	66	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.02	mg/100g
Riboflavin	0.26	mg/100g
Niacin	1.0	mg/100g
Tryptophan/60	4.6	mg/100g
Vitamin B <sub>6</sub>	0.03	mg/100g
Vitamin B <sub>12</sub>	10.56	µg/100g
Folate	25	µg/100g
Pantothenic acid	0.32	mg/100g
Biotin	11.0	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	117	µg/100g
Beta - carotene		µg/100g
Total vitamin A	117	Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	1.72	mg/100g

<sup>1</sup>Energy calculated assuming that mussels contain 3.5g carbohydrate as glycogen (data from mussels boiled (16-256), Fish and Fish Products supplement)

Sample 20: Crab, brown meat, purchased cooked

**PROXIMATES**

Water	66.5	g/100g
Total Nitrogen	3.01	g/100g
Nitrogen conversion factor	6.25	
Protein	18.8	g/100g
Fat	7.8	g/100g
Ash	2.5	g/100g
Energy (kcal)	145	
Energy (kJ)	608	
Cholesterol	271	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	1.26	g/100g
cis-monounsaturated	1.74	g/100g
cis n-3 polyunsaturated	1.30	g/100g
cis n-6 polyunsaturated	0.29	g/100g
cis polyunsaturated	1.60	g/100g
Trans	0.04	g/100g

**INORGANICS**

Sodium (Na)	351	mg/100g
Potassium (K)	167	mg/100g
Calcium (Ca)	366	mg/100g
Magnesium (Mg)	49	mg/100g
Phosphorus (P)	488	mg/100g
Iron (Fe)	2.46	mg/100g
Copper (Cu)	2.49	mg/100g
Zinc (Zn)	5.90	mg/100g
Chloride (Cl)	550	mg/100g
Manganese (Mn)	0.33	mg/100g
Iodine (I)	333	µg/100g
Selenium (Se)	225	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.06	mg/100g
Riboflavin	1.50	mg/100g
Niacin	1.0	mg/100g
Tryptophan/60	6.4	mg/100g
Vitamin B <sub>6</sub>	0.22	mg/100g
Vitamin B <sub>12</sub>	22.40	µg/100g
Folate	19	µg/100g
Pantothenic acid	1.22	mg/100g
Biotin	6.0	µg/100g
Vitamin C	<0.1	mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	6	µg/100g
Beta - carotene		µg/100g
Total vitamin A	6	Ret Equiv
Vitamin D <sub>3</sub>	<0.1	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	<0.1	µg/100g
Vitamin E	7.33	mg/100g

Sample 21: Crab, white meat, purchased cooked

**PROXIMATES**

Water	77.6	g/100g
Total Nitrogen	3.28	g/100g
Nitrogen conversion factor	6.25	
Protein	20.5	g/100g
Fat	0.3	g/100g
Ash	1.6	g/100g
Energy (kcal)	85	
Energy (kJ)	360	
Cholesterol	66	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.04	g/100g
cis-monounsaturated	0.07	g/100g
cis n-3 polyunsaturated	0.07	g/100g
cis n-6 polyunsaturated	0.02	g/100g
cis polyunsaturated	0.08	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	322	mg/100g
Potassium (K)	240	mg/100g
Calcium (Ca)	86	mg/100g
Magnesium (Mg)	34	mg/100g
Phosphorus (P)	147	mg/100g
Iron (Fe)	0.53	mg/100g
Copper (Cu)	0.95	mg/100g
Zinc (Zn)	7.23	mg/100g
Chloride (Cl)	480	mg/100g
Manganese (Mn)	0.04	mg/100g
Iodine (I)	103	µg/100g
Selenium (Se)	87	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.03	mg/100g
Riboflavin	0.25	mg/100g
Niacin	0.5	mg/100g
Tryptophan/60	4.5	mg/100g
Vitamin B <sub>6</sub>	0.10	mg/100g
Vitamin B <sub>12</sub>	3.40	µg/100g
Folate	6	µg/100g
Pantothenic acid	1.99	mg/100g
Biotin	11.4	µg/100g
Vitamin C	<0.1	mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	<0.1	µg/100g
Beta - carotene		µg/100g
Total vitamin A	<0.1	Ret Equiv
Vitamin D <sub>3</sub>	<0.1	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	<0.1	µg/100g
Vitamin E	2.12	mg/100g

Sample 22: Mackerel, raw, flesh only

**PROXIMATES**

Water	61.9	g/100g
Total Nitrogen	2.88	g/100g
Nitrogen conversion factor	6.25	
Protein	18.0	g/100g
Fat	17.9	g/100g
Ash	1.2	g/100g
Energy (kcal)	233	
Energy (kJ)	968	
Cholesterol	60	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	3.85	g/100g
cis-monounsaturated	6.68	g/100g
cis n-3 polyunsaturated	4.05	g/100g
cis n-6 polyunsaturated	0.41	g/100g
cis polyunsaturated	4.46	g/100g
Trans	0.02	g/100g

**INORGANICS**

Sodium (Na)	153	mg/100g
Potassium (K)	335	mg/100g
Calcium (Ca)	20	mg/100g
Magnesium (Mg)	37	mg/100g
Phosphorus (P)	220	mg/100g
Iron (Fe)	0.98	mg/100g
Copper (Cu)	0.08	mg/100g
Zinc (Zn)	0.51	mg/100g
Chloride (Cl)	250	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	29	µg/100g
Selenium (Se)	42	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.17	mg/100g
Riboflavin	0.30	mg/100g
Niacin	11.3	mg/100g
Tryptophan/60	4.4	mg/100g
Vitamin B <sub>6</sub>	0.40	mg/100g
Vitamin B <sub>12</sub>	8.81	µg/100g
Folate	1	µg/100g
Pantothenic acid	0.63	mg/100g
Biotin	5.8	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	54	µg/100g
Beta - carotene		µg/100g
Total vitamin A	54	Ret Equiv
Vitamin D <sub>3</sub>	8.00	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	8.00	µg/100g
Vitamin E	0.43	mg/100g

Sample 23: Mackerel, grilled, flesh only

**PROXIMATES**

Water	53.8	g/100g
Total Nitrogen	3.25	g/100g
Nitrogen conversion factor	6.25	
Protein	20.3	g/100g
Fat	22.4	g/100g
Ash	1.3	g/100g
Energy (kcal)	283	
Energy (kJ)	1174	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	5.10	g/100g
cis-monounsaturated	8.30	g/100g
cis n-3 polyunsaturated	4.83	g/100g
cis n-6 polyunsaturated	0.53	g/100g
cis polyunsaturated	5.36	g/100g
Trans	0.02	g/100g

**INORGANICS**

Sodium (Na)	163	mg/100g
Potassium (K)	349	mg/100g
Calcium (Ca)	17	mg/100g
Magnesium (Mg)	38	mg/100g
Phosphorus (P)	236	mg/100g
Iron (Fe)	1.28	mg/100g
Copper (Cu)	0.10	mg/100g
Zinc (Zn)	0.79	mg/100g
Chloride (Cl)	290	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	60	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.14	mg/100g
Riboflavin	0.37	mg/100g
Niacin	11.1	mg/100g
Tryptophan/60	4.4	mg/100g
Vitamin B <sub>6</sub>	0.27	mg/100g
Vitamin B <sub>12</sub>	9.08	µg/100g
Folate	1	µg/100g
Pantothenic acid	0.57	mg/100g
Biotin	5.2	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	61	µg/100g
Beta - carotene		µg/100g
Total vitamin A	61	Ret Equiv
Vitamin D <sub>3</sub>	8.50	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	8.50	µg/100g
Vitamin E	0.46	mg/100g

Sample 24: Trout, rainbow, raw, flesh only

**PROXIMATES**

Water	76.1	g/100g
Total Nitrogen	3.18	g/100g
Nitrogen conversion factor	6.25	
Protein	19.9	g/100g
Fat	5.3	g/100g
Ash	1.2	g/100g
Energy (kcal)	127	
Energy (kJ)	534	
Cholesterol	60	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	1.21	g/100g
cis-monounsaturated	1.44	g/100g
cis n-3 polyunsaturated	1.41	g/100g
cis n-6 polyunsaturated	0.40	g/100g
cis polyunsaturated	1.80	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	110	mg/100g
Potassium (K)	383	mg/100g
Calcium (Ca)	21	mg/100g
Magnesium (Mg)	26	mg/100g
Phosphorus (P)	228	mg/100g
Iron (Fe)	0.28	mg/100g
Copper (Cu)	0.04	mg/100g
Zinc (Zn)	0.47	mg/100g
Chloride (Cl)	150	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	5	µg/100g
Selenium (Se)	19	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.16	mg/100g
Riboflavin	0.12	mg/100g
Niacin	7.3	mg/100g
Tryptophan/60	4.2	mg/100g
Vitamin B <sub>6</sub>	0.31	mg/100g
Vitamin B <sub>12</sub>	2.84	µg/100g
Folate	9	µg/100g
Pantothenic acid	1.23	mg/100g
Biotin	3.2	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	25	µg/100g
Beta - carotene		µg/100g
Total vitamin A	25	Ret Equiv
Vitamin D <sub>3</sub>	6.99	µg/100g
25-hydroxy vitamin D <sub>3</sub>	0.18	µg/100g
Total vitamin D	7.89	µg/100g
Vitamin E	0.44	mg/100g

Sample 25: Trout, rainbow, baked, flesh only

**PROXIMATES**

Water	70.1	g/100g
Total Nitrogen	3.81	g/100g
Nitrogen conversion factor	6.25	
Protein	23.8	g/100g
Fat	6.1	g/100g
Ash	1.3	g/100g
Energy (kcal)	150	
Energy (kJ)	630	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	1.44	g/100g
cis-monounsaturated	1.55	g/100g
cis n-3 polyunsaturated	1.72	g/100g
cis n-6 polyunsaturated	0.44	g/100g
cis polyunsaturated	2.16	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	93	mg/100g
Potassium (K)	434	mg/100g
Calcium (Ca)	19	mg/100g
Magnesium (Mg)	29	mg/100g
Phosphorus (P)	254	mg/100g
Iron (Fe)	0.40	mg/100g
Copper (Cu)	0.05	mg/100g
Zinc (Zn)	0.56	mg/100g
Chloride (Cl)	160	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	23	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.13	mg/100g
Riboflavin	0.13	mg/100g
Niacin	6.4	mg/100g
Tryptophan/60	5.3	mg/100g
Vitamin B <sub>6</sub>	0.19	mg/100g
Vitamin B <sub>12</sub>	3.11	µg/100g
Folate	11	µg/100g
Pantothenic acid	1.11	mg/100g
Biotin	3.8	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	44	µg/100g
Beta - carotene		µg/100g
Total vitamin A	44	Ret Equiv
Vitamin D <sub>3</sub>	7.19	µg/100g
25-hydroxy vitamin D <sub>3</sub>	0.20	µg/100g
Total vitamin D	8.19	µg/100g
Vitamin E	0.89	mg/100g

Sample 26: Kippers (analysed without butter), grilled, flesh only

**PROXIMATES**

Water	58.6	g/100g
Total Nitrogen	3.47	g/100g
Nitrogen conversion factor	6.25	
Protein	21.7	g/100g
Fat	17.6	g/100g
Ash	3.3	g/100g
Energy (kcal)	245	
Energy (kJ)	1020	
Cholesterol	65	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	3.74	g/100g
cis-monounsaturated	7.38	g/100g
cis n-3 polyunsaturated	3.35	g/100g
cis n-6 polyunsaturated	0.32	g/100g
cis polyunsaturated	3.66	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	947	mg/100g
Potassium (K)	384	mg/100g
Calcium (Ca)	39	mg/100g
Magnesium (Mg)	47	mg/100g
Phosphorus (P)	270	mg/100g
Iron (Fe)	1.51	mg/100g
Copper (Cu)	0.11	mg/100g
Zinc (Zn)	1.07	mg/100g
Chloride (Cl)	1360	mg/100g
Manganese (Mn)	0.02	mg/100g
Iodine (I)	24	µg/100g
Selenium (Se)	57	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	<0.01	mg/100g
Riboflavin	0.27	mg/100g
Niacin	5.1	mg/100g
Tryptophan/60	4.5	mg/100g
Vitamin B <sub>6</sub>	0.29	mg/100g
Vitamin B <sub>12</sub>	11.12	µg/100g
Folate	3	µg/100g
Pantothenic acid	0.81	mg/100g
Biotin	6.1	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	26	µg/100g
Beta - carotene		µg/100g
Total vitamin A	26	Ret Equiv
Vitamin D <sub>3</sub>	8.64	µg/100g
25-hydroxy vitamin D <sub>3</sub>	0.29	µg/100g
Total vitamin D	10.09	µg/100g
Vitamin E	0.47	mg/100g

Sample 27: Kippers, boil in the bag, with butter, cooked

**PROXIMATES**

Water	63.6	g/100g
Total Nitrogen	2.98	g/100g
Nitrogen conversion factor	6.25	
Protein	18.6	g/100g
Fat	13.2	g/100g
Ash	2.9	g/100g
Energy (kcal)	193	
Energy (kJ)	805	
Cholesterol	71	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	2.96	g/100g
cis-monounsaturated	5.79	g/100g
cis n-3 polyunsaturated	2.19	g/100g
cis n-6 polyunsaturated	0.23	g/100g
cis polyunsaturated	2.42	g/100g
Trans	0.02	g/100g

**INORGANICS**

Sodium (Na)	860	mg/100g
Potassium (K)	254	mg/100g
Calcium (Ca)	47	mg/100g
Magnesium (Mg)	38	mg/100g
Phosphorus (P)	208	mg/100g
Iron (Fe)	1.11	mg/100g
Copper (Cu)	0.12	mg/100g
Zinc (Zn)	1.47	mg/100g
Chloride (Cl)	1220	mg/100g
Manganese (Mn)	0.03	mg/100g
Iodine (I)	13	µg/100g
Selenium (Se)	40	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.01	mg/100g
Riboflavin	0.24	mg/100g
Niacin	4.2	mg/100g
Tryptophan/60	4.3	mg/100g
Vitamin B <sub>6</sub>	0.22	mg/100g
Vitamin B <sub>12</sub>	9.48	µg/100g
Folate	3	µg/100g
Pantothenic acid	0.57	mg/100g
Biotin	5.5	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	30	µg/100g
Beta - carotene		µg/100g
Total vitamin A	30	Ret Equiv
Vitamin D <sub>3</sub>	9.50	µg/100g
25-hydroxy vitamin D <sub>3</sub>	0.33	µg/100g
Total vitamin D	11.15	µg/100g
Vitamin E	0.23	mg/100g

Sample 28: Tuna, raw, flesh only

**PROXIMATES**

Water	74.9	g/100g
Total Nitrogen	4.03	g/100g
Nitrogen conversion factor	6.25	
Protein	25.2	g/100g
Fat	0.7	g/100g
Ash	1.4	g/100g
Energy (kcal)	107	
Energy (kJ)	454	
Cholesterol	35	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.21	g/100g
cis-monounsaturated	0.19	g/100g
cis n-3 polyunsaturated	0.09	g/100g
cis n-6 polyunsaturated	0.04	g/100g
cis polyunsaturated	0.13	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	66	mg/100g
Potassium (K)	444	mg/100g
Calcium (Ca)	4	mg/100g
Magnesium (Mg)	39	mg/100g
Phosphorus (P)	266	mg/100g
Iron (Fe)	0.72	mg/100g
Copper (Cu)	0.03	mg/100g
Zinc (Zn)	0.39	mg/100g
Chloride (Cl)	120	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	18	µg/100g
Selenium (Se)	93	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.13	mg/100g
Riboflavin	0.07	mg/100g
Niacin	21.9	mg/100g
Tryptophan/60	6.1	mg/100g
Vitamin B <sub>6</sub>	0.43	mg/100g
Vitamin B <sub>12</sub>	2.21	µg/100g
Folate	4	µg/100g
Pantothenic acid	0.23	mg/100g
Biotin	2.8	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	76	µg/100g
Beta - carotene		µg/100g
Total vitamin A	76	Ret Equiv
Vitamin D <sub>3</sub>	3.20	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	3.20	µg/100g
Vitamin E	0.04	mg/100g

Sample 29: Tuna, baked, flesh only

**PROXIMATES**

Water	68.2	g/100g
Total Nitrogen	5.17	g/100g
Nitrogen conversion factor	6.25	
Protein	32.3	g/100g
Fat	0.8	g/100g
Ash	1.2	g/100g
Energy (kcal)	136	
Energy (kJ)	579	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.29	g/100g
cis-monounsaturated	0.24	g/100g
cis n-3 polyunsaturated	0.11	g/100g
cis n-6 polyunsaturated	0.05	g/100g
cis polyunsaturated	0.16	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	63	mg/100g
Potassium (K)	450	mg/100g
Calcium (Ca)	11	mg/100g
Magnesium (Mg)	41	mg/100g
Phosphorus (P)	290	mg/100g
Iron (Fe)	0.93	mg/100g
Copper (Cu)	0.03	mg/100g
Zinc (Zn)	0.52	mg/100g
Chloride (Cl)	130	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	92	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.12	mg/100g
Riboflavin	0.07	mg/100g
Niacin	17.4	mg/100g
Tryptophan/60	7.5	mg/100g
Vitamin B <sub>6</sub>	0.23	mg/100g
Vitamin B <sub>12</sub>	2.15	µg/100g
Folate	5	µg/100g
Pantothenic acid	0.21	mg/100g
Biotin	2.9	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	78	µg/100g
Beta - carotene		µg/100g
Total vitamin A	78	Ret Equiv
Vitamin D <sub>3</sub>	3.10	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	3.10	µg/100g
Vitamin E	0.13	mg/100g

Sample 30: Sardines, raw, flesh only

**PROXIMATES**

Water	74.4	g/100g
Total Nitrogen	3.17	g/100g
Nitrogen conversion factor	6.25	
Protein	19.8	g/100g
Fat	6.1	g/100g
Ash	1.4	g/100g
Energy (kcal)	134	
Energy (kJ)	562	
Cholesterol	51	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	1.83	g/100g
cis-monounsaturated	1.80	g/100g
cis n-3 polyunsaturated	1.32	g/100g
cis n-6 polyunsaturated	0.24	g/100g
cis polyunsaturated	1.56	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	136	mg/100g
Potassium (K)	387	mg/100g
Calcium (Ca)	50	mg/100g
Magnesium (Mg)	32	mg/100g
Phosphorus (P)	257	mg/100g
Iron (Fe)	1.55	mg/100g
Copper (Cu)	0.13	mg/100g
Zinc (Zn)	0.71	mg/100g
Chloride (Cl)	200	mg/100g
Manganese (Mn)	0.03	mg/100g
Iodine (I)	79	µg/100g
Selenium (Se)	51	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	<0.01	mg/100g
Riboflavin	0.34	mg/100g
Niacin	10.1	mg/100g
Tryptophan/60	5.3	mg/100g
Vitamin B <sub>6</sub>	0.31	mg/100g
Vitamin B <sub>12</sub>	8.31	µg/100g
Folate	7	µg/100g
Pantothenic acid	0.69	mg/100g
Biotin	9.7	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	10	µg/100g
Beta - carotene		µg/100g
Total vitamin A	10	Ret Equiv
Vitamin D <sub>3</sub>	3.95	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	3.95	µg/100g
Vitamin E	0.31	mg/100g

Sample 31: Haddock, smoked, poached

**PROXIMATES**

Water	76.0	g/100g
Total Nitrogen	3.49	g/100g
Nitrogen conversion factor	6.25	
Protein	21.8	g/100g
Fat	0.5	g/100g
Ash	1.9	g/100g
Energy (kcal)	92	
Energy (kJ)	389	
Cholesterol	65	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.09	g/100g
cis-monounsaturated	0.07	g/100g
cis n-3 polyunsaturated	0.19	g/100g
cis n-6 polyunsaturated	0.02	g/100g
cis polyunsaturated	0.21	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	464	mg/100g
Potassium (K)	265	mg/100g
Calcium (Ca)	24	mg/100g
Magnesium (Mg)	25	mg/100g
Phosphorus (P)	164	mg/100g
Iron (Fe)	0.17	mg/100g
Copper (Cu)	0.02	mg/100g
Zinc (Zn)	0.45	mg/100g
Chloride (Cl)	640	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	217	µg/100g
Selenium (Se)	42	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.11	mg/100g
Riboflavin	0.14	mg/100g
Niacin	6.3	mg/100g
Tryptophan/60	5.1	mg/100g
Vitamin B <sub>6</sub>	0.22	mg/100g
Vitamin B <sub>12</sub>	2.37	µg/100g
Folate	8	µg/100g
Pantothenic acid	0.28	mg/100g
Biotin	1.5	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	2	µg/100g
Alpha -carotene	<1	µg/100g
Beta -carotene	<1	µg/100g
Beta-cryptoxanthin	<1	µg/100g
Zeaxanthin	<1	µg/100g
Lutein	<1	µg/100g
Lycopene	<1	µg/100g
Total vitamin A	2	Ret Equiv
Vitamin D <sub>3</sub>	2.00	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	2.00	µg/100g
Vitamin E	0.77	mg/100g

Sample 32: Plaice, coated in breadcrumbs, baked

**PROXIMATES**

Water	52.8	g/100g
Total Nitrogen	2.30	g/100g
Nitrogen conversion factor	6.25	
Protein	14.4	g/100g
Fat	11.6	g/100g
Ash	1.2	g/100g
Energy (kcal)	243	
Energy (kJ)	1018	
Cholesterol	39	mg/100g

**CARBOHYDRATES**

Glucose	0.2	g/100g
Fructose	<0.1	g/100g
Sucrose	<0.1	g/100g
Maltose	1.1	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch	20.2	g/100g
Total sugars	1.3	g/100g
Available carbohydrate	21.5	g/100g
Fibre (Englyst)	0.5	g/100g
Fibre (AOAC)	1.5	g/100g

**FATTY ACIDS**

Saturated	1.23	g/100g
cis-monounsaturated	5.62	g/100g
cis n-3 polyunsaturated	0.76	g/100g
cis n-6 polyunsaturated	3.19	g/100g
cis polyunsaturated	3.95	g/100g
Trans	0.02	g/100g

**INORGANICS**

Sodium (Na)	275	mg/100g
Potassium (K)	178	mg/100g
Calcium (Ca)	61	mg/100g
Magnesium (Mg)	22	mg/100g
Phosphorus (P)	126	mg/100g
Iron (Fe)	0.77	mg/100g
Copper (Cu)	0.05	mg/100g
Zinc (Zn)	0.63	mg/100g
Chloride (Cl)	390	mg/100g
Manganese (Mn)	0.19	mg/100g
Iodine (I)	16	µg/100g
Selenium (Se)	30	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.32	mg/100g
Riboflavin	0.14	mg/100g
Niacin	2.3	mg/100g
Tryptophan/60	2.7	mg/100g
Vitamin B <sub>6</sub>	0.09	mg/100g
Vitamin B <sub>12</sub>	1.64	µg/100g
Folate	9	µg/100g
Pantothenic acid	0.43	mg/100g
Biotin	35.0	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	3.32	mg/100g

Sample 33: Calamari, coated in batter, baked

**PROXIMATES**

Water	42.1	g/100g
Total Nitrogen	1.36	g/100g
Nitrogen conversion factor	6.25	
Protein	8.5	g/100g
Fat	17.5	g/100g
Ash	3.4	g/100g
Energy (kcal)	288	
Energy (kJ)	1206	
Cholesterol	85	mg/100g

**CARBOHYDRATES**

Glucose	<0.1	g/100g
Fructose	<0.1	g/100g
Sucrose	<0.1	g/100g
Maltose	<0.1	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch	25.9	g/100g
Total sugars	<0.1	g/100g
Available carbohydrate	25.9	g/100g
Fibre (Englyst)	0.4	g/100g
Fibre (AOAC)	1.9	g/100g

**FATTY ACIDS**

Saturated	2.07	g/100g
cis-monounsaturated	4.66	g/100g
cis n-3 polyunsaturated	0.25	g/100g
cis n-6 polyunsaturated	9.51	g/100g
cis polyunsaturated	9.76	g/100g
Trans	0.02	g/100g

**INORGANICS**

Sodium (Na)	1182	mg/100g
Potassium (K)	88	mg/100g
Calcium (Ca)	41	mg/100g
Magnesium (Mg)	33	mg/100g
Phosphorus (P)	259	mg/100g
Iron (Fe)	0.52	mg/100g
Copper (Cu)	0.12	mg/100g
Zinc (Zn)	0.81	mg/100g
Chloride (Cl)	1280	mg/100g
Manganese (Mn)	0.19	mg/100g
Iodine (I)	3	µg/100g
Selenium (Se)	17	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.05	mg/100g
Riboflavin	0.40	mg/100g
Niacin	1.2	mg/100g
Tryptophan/60	2.2	mg/100g
Vitamin B <sub>6</sub>	0.03	mg/100g
Vitamin B <sub>12</sub>	1.72	µg/100g
Folate	3	µg/100g
Pantothenic acid	0.68	mg/100g
Biotin	2.5	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	64	µg/100g
Beta - carotene		µg/100g
Total vitamin A	64	Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.75	mg/100g

Sample 34: Fish fingers, cod, grilled/baked

**PROXIMATES**

Water	54.5	g/100g
Total Nitrogen	2.29	g/100g
Nitrogen conversion factor	6.25	
Protein	14.3	g/100g
Fat	9.2	g/100g
Ash	1.4	g/100g
Energy (kcal)	223	
Energy (kJ)	936	
Cholesterol	36	mg/100g

**CARBOHYDRATES**

Glucose	<0.1	g/100g
Fructose	<0.1	g/100g
Sucrose	0.2	g/100g
Maltose	1.3	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch	20.6	g/100g
Total sugars	1.5	g/100g
Available carbohydrate	22.0	g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	1.19	g/100g
cis-monounsaturated	4.40	g/100g
cis n-3 polyunsaturated	0.42	g/100g
cis n-6 polyunsaturated	2.61	g/100g
cis polyunsaturated	3.04	g/100g
Trans	0.02	g/100g

**INORGANICS**

Sodium (Na)	317	mg/100g
Potassium (K)	254	mg/100g
Calcium (Ca)	32	mg/100g
Magnesium (Mg)	25	mg/100g
Phosphorus (P)	142	mg/100g
Iron (Fe)	0.57	mg/100g
Copper (Cu)	0.05	mg/100g
Zinc (Zn)	0.50	mg/100g
Chloride (Cl)	460	mg/100g
Manganese (Mn)	0.20	mg/100g
Iodine (I)	117	µg/100g
Selenium (Se)	18	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.17	mg/100g
Riboflavin	0.08	mg/100g
Niacin	1.2	mg/100g
Tryptophan/60	3.4	mg/100g
Vitamin B <sub>6</sub>	0.09	mg/100g
Vitamin B <sub>12</sub>	1.50	µg/100g
Folate	9	µg/100g
Pantothenic acid	0.24	mg/100g
Biotin	1.2	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	2.75	mg/100g

Sample 35: Fish fingers, cod, fried

**PROXIMATES**

Water	54.5	g/100g
Total Nitrogen		g/100g
Nitrogen conversion factor		
Protein		g/100g
Fat	12.6	g/100g
Ash		g/100g
Energy (kcal)		
Energy (kJ)		
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated		g/100g
cis-monounsaturated		g/100g
cis n-3 polyunsaturated		g/100g
cis n-6 polyunsaturated		g/100g
cis polyunsaturated		g/100g
Trans		g/100g

**INORGANICS**

Sodium (Na)		mg/100g
Potassium (K)		mg/100g
Calcium (Ca)		mg/100g
Magnesium (Mg)		mg/100g
Phosphorus (P)		mg/100g
Iron (Fe)		mg/100g
Copper (Cu)		mg/100g
Zinc (Zn)		mg/100g
Chloride (Cl)		mg/100g
Manganese (Mn)		mg/100g
Iodine (I)		µg/100g
Selenium (Se)		µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin		mg/100g
Riboflavin		mg/100g
Niacin		mg/100g
Tryptophan/60		mg/100g
Vitamin B <sub>6</sub>		mg/100g
Vitamin B <sub>12</sub>		µg/100g
Folate		µg/100g
Pantothenic acid		mg/100g
Biotin		µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E		mg/100g

Sample 36: Fish fingers, salmon, grilled/baked

**PROXIMATES**

Water	50.8	g/100g
Total Nitrogen	2.75	g/100g
Nitrogen conversion factor	6.25	
Protein	17.2	g/100g
Fat	11.2	g/100g
Ash	1.4	g/100g
Energy (kcal)	247	
Energy (kJ)	1038	
Cholesterol	29	mg/100g

**CARBOHYDRATES**

Glucose	0.1	g/100g
Fructose	0.1	g/100g
Sucrose	<0.1	g/100g
Maltose	0.9	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch	19.6	g/100g
Total sugars	1.1	g/100g
Available carbohydrate	20.7	g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	1.07	g/100g
cis-monounsaturated	5.76	g/100g
cis n-3 polyunsaturated	0.93	g/100g
cis n-6 polyunsaturated	2.66	g/100g
cis polyunsaturated	3.60	g/100g
Trans	0.02	g/100g

**INORGANICS**

Sodium (Na)	288	mg/100g
Potassium (K)	300	mg/100g
Calcium (Ca)	14	mg/100g
Magnesium (Mg)	30	mg/100g
Phosphorus (P)	194	mg/100g
Iron (Fe)	0.75	mg/100g
Copper (Cu)	0.07	mg/100g
Zinc (Zn)	0.58	mg/100g
Chloride (Cl)	420	mg/100g
Manganese (Mn)	0.32	mg/100g
Iodine (I)	7	µg/100g
Selenium (Se)	24	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.41	mg/100g
Riboflavin	0.11	mg/100g
Niacin	5.3	mg/100g
Tryptophan/60	4.1	mg/100g
Vitamin B <sub>6</sub>	0.22	mg/100g
Vitamin B <sub>12</sub>	2.27	µg/100g
Folate	15	µg/100g
Pantothenic acid	0.58	mg/100g
Biotin	2.5	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	7	µg/100g
Beta - carotene		µg/100g
Total vitamin A	7	Ret Equiv
Vitamin D <sub>3</sub>	4.50	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	4.50	µg/100g
Vitamin E	2.82	mg/100g

Sample 37: Cod, coated in batter, fried

**PROXIMATES**

Water	49.2	g/100g
Total Nitrogen		g/100g
Nitrogen conversion factor		
Protein		g/100g
Fat	17.9	g/100g
Ash		g/100g
Energy (kcal)		
Energy (kJ)		
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated		g/100g
cis-monounsaturated		g/100g
cis n-3 polyunsaturated		g/100g
cis n-6 polyunsaturated		g/100g
cis polyunsaturated		g/100g
Trans		g/100g

**INORGANICS**

Sodium (Na)		mg/100g
Potassium (K)		mg/100g
Calcium (Ca)		mg/100g
Magnesium (Mg)		mg/100g
Phosphorus (P)		mg/100g
Iron (Fe)		mg/100g
Copper (Cu)		mg/100g
Zinc (Zn)		mg/100g
Chloride (Cl)		mg/100g
Manganese (Mn)		mg/100g
Iodine (I)		µg/100g
Selenium (Se)		µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin		mg/100g
Riboflavin		mg/100g
Niacin		mg/100g
Tryptophan/60		mg/100g
Vitamin B <sub>6</sub>		mg/100g
Vitamin B <sub>12</sub>		µg/100g
Folate		µg/100g
Pantothenic acid		mg/100g
Biotin		µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E		mg/100g

Sample 38: Fishcakes, white fish, coated in breadcrumbs, baked

**PROXIMATES**

Water	56.9	g/100g
Total Nitrogen	1.49	g/100g
Nitrogen conversion factor	6.25	
Protein	9.3	g/100g
Fat	9.4	g/100g
Ash	1.5	g/100g
Energy (kcal)	206	
Energy (kJ)	867	
Cholesterol	30	mg/100g

**CARBOHYDRATES**

Glucose	0.2	g/100g
Fructose	0.2	g/100g
Sucrose	0.1	g/100g
Maltose	1.3	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch	20.8	g/100g
Total sugars	1.8	g/100g
Available carbohydrate	22.6	g/100g
Fibre (Englyst)	0.4	g/100g
Fibre (AOAC)	1.7	g/100g

**FATTY ACIDS**

Saturated	1.00	g/100g
cis-monounsaturated	5.52	g/100g
cis n-3 polyunsaturated	0.55	g/100g
cis n-6 polyunsaturated	1.72	g/100g
cis polyunsaturated	2.27	g/100g
Trans	0.02	g/100g

**INORGANICS**

Sodium (Na)	356	mg/100g
Potassium (K)	233	mg/100g
Calcium (Ca)	51	mg/100g
Magnesium (Mg)	19	mg/100g
Phosphorus (P)	102	mg/100g
Iron (Fe)	0.76	mg/100g
Copper (Cu)	0.06	mg/100g
Zinc (Zn)	0.42	mg/100g
Chloride (Cl)	520	mg/100g
Manganese (Mn)	0.17	mg/100g
Iodine (I)	58	µg/100g
Selenium (Se)	13	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.25	mg/100g
Riboflavin	0.07	mg/100g
Niacin	1.7	mg/100g
Tryptophan/60	1.9	mg/100g
Vitamin B <sub>6</sub>	0.09	mg/100g
Vitamin B <sub>12</sub>	1.44	µg/100g
Folate	6	µg/100g
Pantothenic acid	0.31	mg/100g
Biotin	2.2	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	1.98	mg/100g

Sample 39: Fishcakes, salmon, coated in breadcrumbs, baked

**PROXIMATES**

Water	54.7	g/100g
Total Nitrogen	1.82	g/100g
Nitrogen conversion factor	6.25	
Protein	11.4	g/100g
Fat	13.7	g/100g
Ash	1.6	g/100g
Energy (kcal)	245	
Energy (kJ)	1027	
Cholesterol	25	mg/100g

**CARBOHYDRATES**

Glucose	0.1	g/100g
Fructose	0.2	g/100g
Sucrose	<0.1	g/100g
Maltose	1.3	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch	18.8	g/100g
Total sugars	1.6	g/100g
Available carbohydrate	20.4	g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	2.00	g/100g
cis-monounsaturated	7.00	g/100g
cis n-3 polyunsaturated	1.74	g/100g
cis n-6 polyunsaturated	1.91	g/100g
cis polyunsaturated	3.65	g/100g
Trans	0.04	g/100g

**INORGANICS**

Sodium (Na)	322	mg/100g
Potassium (K)	269	mg/100g
Calcium (Ca)	42	mg/100g
Magnesium (Mg)	21	mg/100g
Phosphorus (P)	150	mg/100g
Iron (Fe)	0.77	mg/100g
Copper (Cu)	0.05	mg/100g
Zinc (Zn)	0.40	mg/100g
Chloride (Cl)	470	mg/100g
Manganese (Mn)	0.15	mg/100g
Iodine (I)	6	µg/100g
Selenium (Se)	13	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.38	mg/100g
Riboflavin	0.10	mg/100g
Niacin	4.7	mg/100g
Tryptophan/60	2.8	mg/100g
Vitamin B <sub>6</sub>	0.22	mg/100g
Vitamin B <sub>12</sub>	1.57	µg/100g
Folate	14	µg/100g
Pantothenic acid	0.74	mg/100g
Biotin	2.3	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	2	µg/100g
Beta - carotene		µg/100g
Total vitamin A	2	Ret Equiv
Vitamin D <sub>3</sub>	5.71	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	5.71	µg/100g
Vitamin E	2.79	mg/100g

Sample 40: Scampi, coated in breadcrumbs, baked

**PROXIMATES**

Water	50.7	g/100g
Total Nitrogen	1.86	g/100g
Nitrogen conversion factor	6.25	
Protein	11.6	g/100g
Fat	10.5	g/100g
Ash	2.3	g/100g
Energy (kcal)	232	
Energy (kJ)	975	
Cholesterol	64	mg/100g

**CARBOHYDRATES**

Glucose	<0.1	g/100g
Fructose	<0.1	g/100g
Sucrose	<0.1	g/100g
Maltose	0.8	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch	23.5	g/100g
Total sugars	0.8	g/100g
Available carbohydrate	24.3	g/100g
Fibre (Englyst)	0.3	g/100g
Fibre (AOAC)	1.5	g/100g

**FATTY ACIDS**

Saturated	0.85	g/100g
cis-monounsaturated	6.24	g/100g
cis n-3 polyunsaturated	0.74	g/100g
cis n-6 polyunsaturated	1.97	g/100g
cis polyunsaturated	2.72	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	561	mg/100g
Potassium (K)	234	mg/100g
Calcium (Ca)	105	mg/100g
Magnesium (Mg)	34	mg/100g
Phosphorus (P)	260	mg/100g
Iron (Fe)	1.91	mg/100g
Copper (Cu)	0.18	mg/100g
Zinc (Zn)	0.81	mg/100g
Chloride (Cl)	620	mg/100g
Manganese (Mn)	0.27	mg/100g
Iodine (I)	101	µg/100g
Selenium (Se)	26	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.16	mg/100g
Riboflavin	0.06	mg/100g
Niacin	2.1	mg/100g
Tryptophan/60	2.4	mg/100g
Vitamin B <sub>6</sub>	0.06	mg/100g
Vitamin B <sub>12</sub>	1.52	µg/100g
Folate	14	µg/100g
Pantothenic acid	0.29	mg/100g
Biotin	2.1	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	3.18	mg/100g

Sample 41: Scampi, coated in breadcrumbs, fried

**PROXIMATES**

Water	51.6	g/100g
Total Nitrogen		g/100g
Nitrogen conversion factor		
Protein		g/100g
Fat	13.0	g/100g
Ash		g/100g
Energy (kcal)		
Energy (kJ)		
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated		g/100g
cis-monounsaturated		g/100g
cis n-3 polyunsaturated		g/100g
cis n-6 polyunsaturated		g/100g
cis polyunsaturated		g/100g
Trans		g/100g

**INORGANICS**

Sodium (Na)	mg/100g
Potassium (K)	mg/100g
Calcium (Ca)	mg/100g
Magnesium (Mg)	mg/100g
Phosphorus (P)	mg/100g
Iron (Fe)	mg/100g
Copper (Cu)	mg/100g
Zinc (Zn)	mg/100g
Chloride (Cl)	mg/100g
Manganese (Mn)	mg/100g
Iodine (I)	µg/100g
Selenium (Se)	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	mg/100g
Riboflavin	mg/100g
Niacin	mg/100g
Tryptophan/60	mg/100g
Vitamin B <sub>6</sub>	mg/100g
Vitamin B <sub>12</sub>	µg/100g
Folate	µg/100g
Pantothenic acid	mg/100g
Biotin	µg/100g
Vitamin C	mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	µg/100g
Beta - carotene	µg/100g
Total vitamin A	Ret Equiv
Vitamin D <sub>3</sub>	µg/100g
25-hydroxy vitamin D <sub>3</sub>	µg/100g
Total vitamin D	µg/100g
Vitamin E	mg/100g

Sample 42: Fish pie, white fish, retail, baked

**PROXIMATES**

Water	73.8	g/100g
Total Nitrogen	1.06	g/100g
Nitrogen conversion factor	6.25	
Protein	6.6	g/100g
Fat	4.8	g/100g
Ash	1.5	g/100g
Energy (kcal)	124	
Energy (kJ)	521	
Cholesterol	29	mg/100g

**CARBOHYDRATES**

Glucose	0.2	g/100g
Fructose	<0.1	g/100g
Sucrose	0.3	g/100g
Maltose	<0.1	g/100g
Lactose	1.2	g/100g
Galactose	<0.1	g/100g
Starch	12.7	g/100g
Total sugars	1.8	g/100g
Available carbohydrate	14.4	g/100g
Fibre (Englyst)	0.6	g/100g
Fibre (AOAC)	2.1	g/100g

**FATTY ACIDS**

Saturated	2.55	g/100g
cis-monounsaturated	1.39	g/100g
cis n-3 polyunsaturated	0.12	g/100g
cis n-6 polyunsaturated	0.22	g/100g
cis polyunsaturated	0.33	g/100g
Trans	0.12	g/100g

**INORGANICS**

Sodium (Na)	254	mg/100g
Potassium (K)	300	mg/100g
Calcium (Ca)	86	mg/100g
Magnesium (Mg)	21	mg/100g
Phosphorus (P)	119	mg/100g
Iron (Fe)	0.35	mg/100g
Copper (Cu)	0.04	mg/100g
Zinc (Zn)	0.54	mg/100g
Chloride (Cl)	380	mg/100g
Manganese (Mn)	0.08	mg/100g
Iodine (I)	33	µg/100g
Selenium (Se)	7	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.11	mg/100g
Riboflavin	0.13	mg/100g
Niacin	0.8	mg/100g
Tryptophan/60	1.6	mg/100g
Vitamin B <sub>6</sub>	0.02	mg/100g
Vitamin B <sub>12</sub>	1.29	µg/100g
Folate	9	µg/100g
Pantothenic acid	0.40	mg/100g
Biotin	3.1	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	83	µg/100g
Alpha -carotene	<1	µg/100g
Beta -carotene	6	µg/100g
Beta-cryptoxanthin	<1	µg/100g
Zeaxanthin	<1	µg/100g
Lutein	<1	µg/100g
Lycopene	<1	µg/100g
Total vitamin A	84	Ret Equiv
Vitamin D <sub>3</sub>	2.82	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	2.82	µg/100g
Vitamin E	0.51	mg/100g

Sample 43: Mussels in white wine sauce, cooked

**PROXIMATES**

Water	82.0	g/100g
Total Nitrogen	1.55	g/100g
Nitrogen conversion factor	6.25	
Protein	9.7	g/100g
Fat	3.2	g/100g
Ash	2.3	g/100g
Energy (kcal)	81	
Energy (kJ)	342	
Cholesterol	25	mg/100g

**CARBOHYDRATES**

Glucose	<0.1	g/100g
Fructose	<0.1	g/100g
Sucrose	<0.1	g/100g
Maltose	<0.1	g/100g
Lactose	0.8	g/100g
Galactose	<0.1	g/100g
Starch	2.9	g/100g
Total sugars	0.8	g/100g
Available carbohydrate	3.7	g/100g
Fibre (Englyst)	<0.1	g/100g
Fibre (AOAC)	<0.5	g/100g

**FATTY ACIDS**

Saturated	1.26	g/100g
cis-monounsaturated	0.71	g/100g
cis n-3 polyunsaturated	0.26	g/100g
cis n-6 polyunsaturated	0.62	g/100g
cis polyunsaturated	0.89	g/100g
Trans	0.04	g/100g

**INORGANICS**

Sodium (Na)	608	mg/100g
Potassium (K)	173	mg/100g
Calcium (Ca)	68	mg/100g
Magnesium (Mg)	76	mg/100g
Phosphorus (P)	122	mg/100g
Iron (Fe)	1.46	mg/100g
Copper (Cu)	0.08	mg/100g
Zinc (Zn)	1.54	mg/100g
Chloride (Cl)	970	mg/100g
Manganese (Mn)	0.07	mg/100g
Iodine (I)	282	µg/100g
Selenium (Se)	32	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.05	mg/100g
Riboflavin	0.18	mg/100g
Niacin	0.8	mg/100g
Tryptophan/60	1.8	mg/100g
Vitamin B <sub>6</sub>	0.03	mg/100g
Vitamin B <sub>12</sub>	9.44	µg/100g
Folate	26	µg/100g
Pantothenic acid	0.39	mg/100g
Biotin	4.8	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	10	µg/100g
Alpha -carotene	<1	µg/100g
Beta -carotene	3	µg/100g
Beta-cryptoxanthin	<1	µg/100g
Zeaxanthin	<1	µg/100g
Lutein	<1	µg/100g
Lycopene	<1	µg/100g
Total vitamin A	11	Ret Equiv
Vitamin D <sub>3</sub>	<0.1	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	<0.1	µg/100g
Vitamin E	0.84	mg/100g

Sample 44: Salmon, smoked (cold-smoked)

**PROXIMATES**

Water	64.5	g/100g
Total Nitrogen	3.65	g/100g
Nitrogen conversion factor	6.25	
Protein	22.8	g/100g
Fat	10.1	g/100g
Ash	4.1	g/100g
Energy (kcal)	184	
Energy (kJ)	769	
Cholesterol	45	mg/100g

**CARBOHYDRATES**

Glucose	<0.1	g/100g
Fructose	<0.1	g/100g
Sucrose	<0.1	g/100g
Maltose	0.5	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch		g/100g
Total sugars	0.5	g/100g
Available carbohydrate	0.5	g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	2.15	g/100g
cis-monounsaturated	3.10	g/100g
cis n-3 polyunsaturated	2.18	g/100g
cis n-6 polyunsaturated	0.66	g/100g
cis polyunsaturated	2.84	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	1184	mg/100g
Potassium (K)	442	mg/100g
Calcium (Ca)	8	mg/100g
Magnesium (Mg)	31	mg/100g
Phosphorus (P)	266	mg/100g
Iron (Fe)	0.23	mg/100g
Copper (Cu)	0.02	mg/100g
Zinc (Zn)	0.36	mg/100g
Chloride (Cl)	1480	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	9	µg/100g
Selenium (Se)	19	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.43	mg/100g
Riboflavin	0.12	mg/100g
Niacin	8.3	mg/100g
Tryptophan/60	5.4	mg/100g
Vitamin B <sub>6</sub>	0.73	mg/100g
Vitamin B <sub>12</sub>	3.15	µg/100g
Folate	15	µg/100g
Pantothenic acid	1.22	mg/100g
Biotin	5.2	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	28	µg/100g
Beta - carotene		µg/100g
Total vitamin A	28	Ret Equiv
Vitamin D <sub>3</sub>	7.40	µg/100g
25-hydroxy vitamin D <sub>3</sub>	0.30	µg/100g
Total vitamin D	8.90	µg/100g
Vitamin E	2.03	mg/100g

Sample 45: Salmon, smoked (hot-smoked)

**PROXIMATES**

Water	60.1	g/100g
Total Nitrogen	4.06	g/100g
Nitrogen conversion factor	6.25	
Protein	25.4	g/100g
Fat	8.8	g/100g
Ash	3.3	g/100g
Energy (kcal)	186	
Energy (kJ)	778	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose	<0.1	g/100g
Fructose	<0.1	g/100g
Sucrose	0.8	g/100g
Maltose	0.4	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch		g/100g
Total sugars	1.3	g/100g
Available carbohydrate	1.3	g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	1.94	g/100g
cis-monounsaturated	2.63	g/100g
cis n-3 polyunsaturated	2.28	g/100g
cis n-6 polyunsaturated	0.64	g/100g
cis polyunsaturated	2.92	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	848	mg/100g
Potassium (K)	460	mg/100g
Calcium (Ca)	8	mg/100g
Magnesium (Mg)	32	mg/100g
Phosphorus (P)	293	mg/100g
Iron (Fe)	0.34	mg/100g
Copper (Cu)	0.05	mg/100g
Zinc (Zn)	0.49	mg/100g
Chloride (Cl)	1200	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	24	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.41	mg/100g
Riboflavin	0.16	mg/100g
Niacin	9.5	mg/100g
Tryptophan/60	6.5	mg/100g
Vitamin B <sub>6</sub>	0.51	mg/100g
Vitamin B <sub>12</sub>	4.19	µg/100g
Folate	14	µg/100g
Pantothenic acid	1.35	mg/100g
Biotin	4.0	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>	9.75	µg/100g
25-hydroxy vitamin D <sub>3</sub>	0.25	µg/100g
Total vitamin D	11.00	µg/100g
Vitamin E	2.29	mg/100g

Sample 46: Mackerel, smoked

**PROXIMATES**

Water	50.9	g/100g
Total Nitrogen	3.38	g/100g
Nitrogen conversion factor	6.25	
Protein	21.1	g/100g
Fat	24.1	g/100g
Ash	2.9	g/100g
Energy (kcal)	301	
Energy (kJ)	1250	
Cholesterol	63	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	5.04	g/100g
cis-monounsaturated	9.33	g/100g
cis n-3 polyunsaturated	5.57	g/100g
cis n-6 polyunsaturated	0.58	g/100g
cis polyunsaturated	6.14	g/100g
Trans	0.02	g/100g

**INORGANICS**

Sodium (Na)	746	mg/100g
Potassium (K)	319	mg/100g
Calcium (Ca)	33	mg/100g
Magnesium (Mg)	38	mg/100g
Phosphorus (P)	237	mg/100g
Iron (Fe)	1.13	mg/100g
Copper (Cu)	0.07	mg/100g
Zinc (Zn)	0.92	mg/100g
Chloride (Cl)	1010	mg/100g
Manganese (Mn)	0.02	mg/100g
Iodine (I)	28	µg/100g
Selenium (Se)	59	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.15	mg/100g
Riboflavin	0.37	mg/100g
Niacin	6.9	mg/100g
Tryptophan/60	4.6	mg/100g
Vitamin B <sub>6</sub>	0.28	mg/100g
Vitamin B <sub>12</sub>	10.18	µg/100g
Folate	4	µg/100g
Pantothenic acid	0.61	mg/100g
Biotin	4.0	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	36	µg/100g
Beta - carotene		µg/100g
Total vitamin A	36	Ret Equiv
Vitamin D <sub>3</sub>	8.20	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	8.20	µg/100g
Vitamin E	0.46	mg/100g

Sample 47: Seafood sticks

**PROXIMATES**

Water	73.3	g/100g
Total Nitrogen	1.17	g/100g
Nitrogen conversion factor	6.25	
Protein	7.3	g/100g
Fat	1.9	g/100g
Ash	2.1	g/100g
Energy (kcal)	102	
Energy (kJ)	433	
Cholesterol	16	mg/100g

**CARBOHYDRATES**

Glucose	<0.1	g/100g
Fructose	<0.1	g/100g
Sucrose	4.8	g/100g
Maltose	<0.1	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch	10.1	g/100g
Total sugars	4.8	g/100g
Available carbohydrate	14.9	g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.29	g/100g
cis-monounsaturated	0.72	g/100g
cis n-3 polyunsaturated	0.19	g/100g
cis n-6 polyunsaturated	0.52	g/100g
cis polyunsaturated	0.71	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	714	mg/100g
Potassium (K)	21	mg/100g
Calcium (Ca)	50	mg/100g
Magnesium (Mg)	8	mg/100g
Phosphorus (P)	61	mg/100g
Iron (Fe)	0.19	mg/100g
Copper (Cu)	0.01	mg/100g
Zinc (Zn)	0.28	mg/100g
Chloride (Cl)	940	mg/100g
Manganese (Mn)	0.02	mg/100g
Iodine (I)	21	µg/100g
Selenium (Se)	19	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.01	mg/100g
Riboflavin	0.06	mg/100g
Niacin	1.2	mg/100g
Tryptophan/60	2.0	mg/100g
Vitamin B <sub>6</sub>	0.03	mg/100g
Vitamin B <sub>12</sub>	0.94	µg/100g
Folate	12	µg/100g
Pantothenic acid	0.30	mg/100g
Biotin	3.3	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	0.47	mg/100g

Sample 48: Tuna, canned in brine

**PROXIMATES**

Water	74.3	g/100g
Total Nitrogen	3.98	g/100g
Nitrogen conversion factor	6.25	
Protein	24.9	g/100g
Fat	1.0	g/100g
Ash	1.5	g/100g
Energy (kcal)	109	
Energy (kJ)	460	
Cholesterol	47	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.30	g/100g
cis-monounsaturated	0.17	g/100g
cis n-3 polyunsaturated	0.32	g/100g
cis n-6 polyunsaturated	0.08	g/100g
cis polyunsaturated	0.40	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	293	mg/100g
Potassium (K)	230	mg/100g
Calcium (Ca)	10	mg/100g
Magnesium (Mg)	27	mg/100g
Phosphorus (P)	171	mg/100g
Iron (Fe)	1.51	mg/100g
Copper (Cu)	0.07	mg/100g
Zinc (Zn)	0.89	mg/100g
Chloride (Cl)	490	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	12	µg/100g
Selenium (Se)	69	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	<0.01	mg/100g
Riboflavin	0.11	mg/100g
Niacin	10.3	mg/100g
Tryptophan/60	6.2	mg/100g
Vitamin B <sub>6</sub>	0.31	mg/100g
Vitamin B <sub>12</sub>	3.42	µg/100g
Folate	3	µg/100g
Pantothenic acid	0.19	mg/100g
Biotin	2.7	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	26	µg/100g
Beta - carotene		µg/100g
Total vitamin A	26	Ret Equiv
Vitamin D <sub>3</sub>	1.10	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	1.10	µg/100g
Vitamin E	0.42	mg/100g

Sample 49: Tuna, canned in sunflower oil

**PROXIMATES**

Water	67.1	g/100g
Total Nitrogen	4.06	g/100g
Nitrogen conversion factor	6.25	
Protein	25.4	g/100g
Fat	6.4	g/100g
Ash	1.8	g/100g
Energy (kcal)	159	
Energy (kJ)	669	
Cholesterol		mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.78	g/100g
cis-monounsaturated	1.64	g/100g
cis n-3 polyunsaturated	0.18	g/100g
cis n-6 polyunsaturated	3.43	g/100g
cis polyunsaturated	3.62	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	368	mg/100g
Potassium (K)	267	mg/100g
Calcium (Ca)	11	mg/100g
Magnesium (Mg)	35	mg/100g
Phosphorus (P)	204	mg/100g
Iron (Fe)	1.19	mg/100g
Copper (Cu)	0.05	mg/100g
Zinc (Zn)	0.80	mg/100g
Chloride (Cl)	610	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	87	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin		mg/100g
Riboflavin		mg/100g
Niacin		mg/100g
Tryptophan/60		mg/100g
Vitamin B <sub>6</sub>		mg/100g
Vitamin B <sub>12</sub>		µg/100g
Folate		µg/100g
Pantothenic acid		mg/100g
Biotin		µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	2.84	mg/100g

Sample 50: Salmon, red, canned

**PROXIMATES**

Water	66.5	g/100g
Total Nitrogen	3.76	g/100g
Nitrogen conversion factor	6.25	
Protein	23.5	g/100g
Fat	7.3	g/100g
Ash	2.1	g/100g
Energy (kcal)	160	
Energy (kJ)	670	
Cholesterol	62	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	1.43	g/100g
cis-monounsaturated	3.01	g/100g
cis n-3 polyunsaturated	1.65	g/100g
cis n-6 polyunsaturated	0.15	g/100g
cis polyunsaturated	1.80	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	430	mg/100g
Potassium (K)	305	mg/100g
Calcium (Ca)	164	mg/100g
Magnesium (Mg)	29	mg/100g
Phosphorus (P)	291	mg/100g
Iron (Fe)	0.68	mg/100g
Copper (Cu)	0.06	mg/100g
Zinc (Zn)	0.82	mg/100g
Chloride (Cl)	670	mg/100g
Manganese (Mn)	0.02	mg/100g
Iodine (I)	22	µg/100g
Selenium (Se)	37	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.03	mg/100g
Riboflavin	0.21	mg/100g
Niacin	7.6	mg/100g
Tryptophan/60	6.1	mg/100g
Vitamin B <sub>6</sub>	0.20	mg/100g
Vitamin B <sub>12</sub>	4.88	µg/100g
Folate	14	µg/100g
Pantothenic acid	0.88	mg/100g
Biotin	4.1	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	7	µg/100g
Beta - carotene		µg/100g
Total vitamin A	7	Ret Equiv
Vitamin D <sub>3</sub>	9.10	µg/100g
25-hydroxy vitamin D <sub>3</sub>	0.36	µg/100g
Total vitamin D	10.90	µg/100g
Vitamin E	1.65	mg/100g

Sample 51: Salmon, red, canned, skinless and boneless

**PROXIMATES**

Water	68.5	g/100g
Total Nitrogen	3.71	g/100g
Nitrogen conversion factor	6.25	
Protein	23.2	g/100g
Fat	6.7	g/100g
Ash	1.9	g/100g
Energy (kcal)	153	
Energy (kJ)	642	
Cholesterol	61	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	1.28	g/100g
cis-monounsaturated	2.75	g/100g
cis n-3 polyunsaturated	1.50	g/100g
cis n-6 polyunsaturated	0.15	g/100g
cis polyunsaturated	1.65	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	379	mg/100g
Potassium (K)	304	mg/100g
Calcium (Ca)	6	mg/100g
Magnesium (Mg)	27	mg/100g
Phosphorus (P)	214	mg/100g
Iron (Fe)	0.60	mg/100g
Copper (Cu)	0.07	mg/100g
Zinc (Zn)	0.52	mg/100g
Chloride (Cl)	580	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	24	µg/100g
Selenium (Se)	38	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.04	mg/100g
Riboflavin	0.22	mg/100g
Niacin	6.9	mg/100g
Tryptophan/60	6.1	mg/100g
Vitamin B <sub>6</sub>	0.23	mg/100g
Vitamin B <sub>12</sub>	4.50	µg/100g
Folate	12	µg/100g
Pantothenic acid	0.82	mg/100g
Biotin	4.9	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	10	µg/100g
Beta - carotene		µg/100g
Total vitamin A	10	Ret Equiv
Vitamin D <sub>3</sub>	10.12	µg/100g
25-hydroxy vitamin D <sub>3</sub>	0.34	µg/100g
Total vitamin D	11.82	µg/100g
Vitamin E	1.47	mg/100g

Sample 52: Salmon, pink, canned

**PROXIMATES**

Water	71.4	g/100g
Total Nitrogen	3.78	g/100g
Nitrogen conversion factor	6.25	
Protein	23.6	g/100g
Fat	4.8	g/100g
Ash	2.1	g/100g
Energy (kcal)	138	
Energy (kJ)	579	
Cholesterol	61	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.92	g/100g
cis-monounsaturated	1.71	g/100g
cis n-3 polyunsaturated	1.34	g/100g
cis n-6 polyunsaturated	0.11	g/100g
cis polyunsaturated	1.45	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	352	mg/100g
Potassium (K)	326	mg/100g
Calcium (Ca)	109	mg/100g
Magnesium (Mg)	25	mg/100g
Phosphorus (P)	234	mg/100g
Iron (Fe)	0.83	mg/100g
Copper (Cu)	0.07	mg/100g
Zinc (Zn)	0.65	mg/100g
Chloride (Cl)	500	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	18	µg/100g
Selenium (Se)	34	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.02	mg/100g
Riboflavin	0.21	mg/100g
Niacin	7.4	mg/100g
Tryptophan/60	6.0	mg/100g
Vitamin B <sub>6</sub>	0.19	mg/100g
Vitamin B <sub>12</sub>	4.68	µg/100g
Folate	19	µg/100g
Pantothenic acid	0.68	mg/100g
Biotin	4.9	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	12	µg/100g
Beta - carotene		µg/100g
Total vitamin A	12	Ret Equiv
Vitamin D <sub>3</sub>	12.09	µg/100g
25-hydroxy vitamin D <sub>3</sub>	0.30	µg/100g
Total vitamin D	13.59	µg/100g
Vitamin E	0.76	mg/100g

Sample 53: Mackerel, canned in brine

**PROXIMATES**

Water	65.0	g/100g
Total Nitrogen	3.07	g/100g
Nitrogen conversion factor	6.25	
Protein	19.2	g/100g
Fat	14.1	g/100g
Ash	1.4	g/100g
Energy (kcal)	204	
Energy (kJ)	848	
Cholesterol	52	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	3.17	g/100g
cis-monounsaturated	4.81	g/100g
cis n-3 polyunsaturated	3.53	g/100g
cis n-6 polyunsaturated	0.33	g/100g
cis polyunsaturated	3.86	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	276	mg/100g
Potassium (K)	227	mg/100g
Calcium (Ca)	14	mg/100g
Magnesium (Mg)	22	mg/100g
Phosphorus (P)	162	mg/100g
Iron (Fe)	0.89	mg/100g
Copper (Cu)	0.07	mg/100g
Zinc (Zn)	0.61	mg/100g
Chloride (Cl)	410	mg/100g
Manganese (Mn)	0.01	mg/100g
Iodine (I)	17	µg/100g
Selenium (Se)	41	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.04	mg/100g
Riboflavin	0.22	mg/100g
Niacin	5.5	mg/100g
Tryptophan/60	5.9	mg/100g
Vitamin B <sub>6</sub>	0.15	mg/100g
Vitamin B <sub>12</sub>	6.98	µg/100g
Folate	4	µg/100g
Pantothenic acid	0.35	mg/100g
Biotin	3.6	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	11	µg/100g
Beta - carotene		µg/100g
Total vitamin A	11	Ret Equiv
Vitamin D <sub>3</sub>	7.40	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	7.40	µg/100g
Vitamin E	0.30	mg/100g

Sample 54: Sardines, canned in tomato sauce, whole contents

**PROXIMATES**

Water	67.3	g/100g
Total Nitrogen	2.96	g/100g
Nitrogen conversion factor	6.25	
Protein	18.5	g/100g
Fat	10.8	g/100g
Ash	2.8	g/100g
Energy (kcal)	175	
Energy (kJ)	729	
Cholesterol	71	mg/100g

**CARBOHYDRATES**

Glucose	0.3	g/100g
Fructose	0.6	g/100g
Sucrose	<0.1	g/100g
Maltose	<0.1	g/100g
Lactose	<0.1	g/100g
Galactose	<0.1	g/100g
Starch	<0.5	g/100g
Total sugars	0.9	g/100g
Available carbohydrate	0.9	g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	2.89	g/100g
cis-monounsaturated	2.70	g/100g
cis n-3 polyunsaturated	2.98	g/100g
cis n-6 polyunsaturated	0.51	g/100g
cis polyunsaturated	3.49	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	315	mg/100g
Potassium (K)	371	mg/100g
Calcium (Ca)	455	mg/100g
Magnesium (Mg)	38	mg/100g
Phosphorus (P)	417	mg/100g
Iron (Fe)	2.69	mg/100g
Copper (Cu)	0.12	mg/100g
Zinc (Zn)	1.98	mg/100g
Chloride (Cl)	480	mg/100g
Manganese (Mn)	0.18	mg/100g
Iodine (I)		µg/100g
Selenium (Se)	39	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.03	mg/100g
Riboflavin	0.22	mg/100g
Niacin	5.5	mg/100g
Tryptophan/60	5.2	mg/100g
Vitamin B <sub>6</sub>	0.25	mg/100g
Vitamin B <sub>12</sub>	8.85	µg/100g
Folate	4	µg/100g
Pantothenic acid	0.63	mg/100g
Biotin	5.9	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Alpha -carotene	57	µg/100g
Beta -carotene	246	µg/100g
Beta-cryptoxanthin	2	µg/100g
Zeaxanthin		µg/100g
Lutein	36	µg/100g
Lycopene	5127	µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	1.84	mg/100g

Sample 55: Sardines, canned in brine

**PROXIMATES**

Water	66.1	g/100g
Total Nitrogen	3.54	g/100g
Nitrogen conversion factor	6.25	
Protein	22.1	g/100g
Fat	9.1	g/100g
Ash	3.1	g/100g
Energy (kcal)	170	
Energy (kJ)	712	
Cholesterol	66	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	2.61	g/100g
cis-monounsaturated	2.29	g/100g
cis n-3 polyunsaturated	2.50	g/100g
cis n-6 polyunsaturated	0.23	g/100g
cis polyunsaturated	2.73	g/100g
Trans	0.01	g/100g

**INORGANICS**

Sodium (Na)	368	mg/100g
Potassium (K)	287	mg/100g
Calcium (Ca)	679	mg/100g
Magnesium (Mg)	42	mg/100g
Phosphorus (P)	545	mg/100g
Iron (Fe)	2.73	mg/100g
Copper (Cu)	0.13	mg/100g
Zinc (Zn)	2.23	mg/100g
Chloride (Cl)	560	mg/100g
Manganese (Mn)	0.18	mg/100g
Iodine (I)	26	µg/100g
Selenium (Se)	41	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.01	mg/100g
Riboflavin	0.22	mg/100g
Niacin	5.5	mg/100g
Tryptophan/60	4.2	mg/100g
Vitamin B <sub>6</sub>	0.07	mg/100g
Vitamin B <sub>12</sub>	10.81	µg/100g
Folate	4	µg/100g
Pantothenic acid	0.64	mg/100g
Biotin	4.7	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)	10	µg/100g
Beta - carotene		µg/100g
Total vitamin A	10	Ret Equiv
Vitamin D <sub>3</sub>	3.27	µg/100g
25-hydroxy vitamin D <sub>3</sub>	<0.1	µg/100g
Total vitamin D	3.27	µg/100g
Vitamin E	0.24	mg/100g

Sample 56: Langoustine, boiled

**PROXIMATES**

Water	80.7	g/100g
Total Nitrogen	3.15	g/100g
Nitrogen conversion factor	6.25	
Protein	19.7	g/100g
Fat	0.8	g/100g
Ash	1.5	g/100g
Energy (kcal)	86	
Energy (kJ)	369	
Cholesterol	133	mg/100g

**CARBOHYDRATES**

Glucose		g/100g
Fructose		g/100g
Sucrose		g/100g
Maltose		g/100g
Lactose		g/100g
Galactose		g/100g
Starch		g/100g
Total sugars		g/100g
Available carbohydrate		g/100g
Fibre (Englyst)		g/100g
Fibre (AOAC)		g/100g

**FATTY ACIDS**

Saturated	0.15	g/100g
cis-monounsaturated	0.15	g/100g
cis n-3 polyunsaturated	0.17	g/100g
cis n-6 polyunsaturated	0.04	g/100g
cis polyunsaturated	0.21	g/100g
Trans	<0.01	g/100g

**INORGANICS**

Sodium (Na)	216	mg/100g
Potassium (K)	214	mg/100g
Calcium (Ca)	125	mg/100g
Magnesium (Mg)	53	mg/100g
Phosphorus (P)	197	mg/100g
Iron (Fe)	1.68	mg/100g
Copper (Cu)	0.32	mg/100g
Zinc (Zn)	1.37	mg/100g
Chloride (Cl)	280	mg/100g
Manganese (Mn)	0.12	mg/100g
Iodine (I)	139	µg/100g
Selenium (Se)	49	µg/100g

**WATER SOLUBLE VITAMINS**

Thiamin	0.08	mg/100g
Riboflavin	0.06	mg/100g
Niacin	2.7	mg/100g
Tryptophan/60	3.7	mg/100g
Vitamin B <sub>6</sub>	0.10	mg/100g
Vitamin B <sub>12</sub>	2.45	µg/100g
Folate	5	µg/100g
Pantothenic acid	0.24	mg/100g
Biotin	3.4	µg/100g
Vitamin C		mg/100g

**FAT SOLUBLE VITAMINS**

Retinol (all-trans + 13-cis)		µg/100g
Beta - carotene		µg/100g
Total vitamin A		Ret Equiv
Vitamin D <sub>3</sub>		µg/100g
25-hydroxy vitamin D <sub>3</sub>		µg/100g
Total vitamin D		µg/100g
Vitamin E	3.55	mg/100g

# Analytical Methods

## **Moisture:**

A homogenised portion of the sample is mixed with sand and heated to 102°C. The moisture loss is determined gravimetrically.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

Ref: BS 4401 pt3:1997

LOQ 0.1 g/100g

## **Ash:**

A homogenised portion of the sample is ashed in a muffle furnace at 550°C. The ash is determined gravimetrically.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

Ref: BS 4401 pt11:1998

LOQ 0.1 g/100g

## **Protein:**

The sample is analysed using Leco instrumentation following the Dumas procedure: The sample is combusted in an oxygen atmosphere, the gaseous product is cleaned and nitrogen compounds converted to nitrogen which is measured by a thermal conductivity cell. The crude protein is calculated by multiplying by the appropriate conversion factor.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

LOQ 0.1 g/100g

## **Fat:**

The sample is acid hydrolysed with hydrochloric acid, cooled, filtered and dried. The fat is extract from the residue with petroleum ether and the dried fat determined gravimetrically.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

Ref: BS 4401 pt4:1970 (Weibull Stoldt)

LOQ 0.1 g/100g

## **Fatty acids:**

The lipid fractions of the sample are solvent extracted. The isolated fat is transesterified with methanolic sodium methoxide to form fatty acid methyl esters (FAMES). The FAME profile is determined using capillary gas chromatography (GC). Quantification and identification of individual FAMES in the test material is achieved with reference to calibration standards.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

LOQ 0.01 mg/100g

## **Sugars:**

The sugars are extracted with water, clarified and chromatographically separated on an amine column with an acetonitrile/water mobile phase. The sugars are detected using an evaporative light scattering detector and quantified with reference to calibration standards.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

LOQ 0.1 g/100g

### **Starch:**

The method consists of two separate determinations. The sample is treated with warm diluted hydrochloric acid, clarified and filtered; the optical rotation of the resulting solution is determined. In the second determination, the sample is extracted with 40% ethanol and filtered. The filtrate is acidified with hydrochloric acid, clarified and filtered again; the optical rotation of the resulting solution is determined at  $20 \pm 2^\circ\text{C}$ .

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

Ref: The Feeding Stuffs (Sampling and Analysis) Regulations 1982 Method 30a.

LOQ 2 g/100g

### **Oligosaccharides:**

Malto-oligosaccharides (DP1-7) are determined individually by High Performance Anion Exchange Chromatography with Pulsed Amperometric Detection. In-house method

LOQ 0.1 g/100g

### **Dietary Fibre:**

#### **AOAC**

The sample is weighed and de-fatted if necessary. It is then gelatinised and treated with  $\alpha$ -amylase and further digested enzymatically with protease and amyloglucosidase to remove the starch and protein. The dietary fibre is precipitated with IMS, filtered, washed, dried and weighed. Total dietary fibre is then determined gravimetrically and corrected for protein and ash.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

Ref: AOAC 985.29/45.4.07 (2007)

LOQ 0.5 g/100g

### **Englyst (Non-starch polysaccharides)**

Englyst Fibrezym kit with colorimetric end point

LOQ 0.2 g/100g

### **Cholesterol:**

Method Lipid in sample is saponified at high temperature with ethanolic KOH solution. Unsaponifiable fraction containing cholesterol and other sterols is extracted with toluene. Sterols are derivatized to trimethylsilyl (TMS) ethers and then quantified by GC.

LOQ 0.7 mg/100 g

Reproducibility 20%

Reference Method ISO 6799: 1992

### **Inorganics:**

#### **Sodium, Potassium, Calcium, Magnesium, Copper, Iron, Manganese, Zinc, Phosphorus, Selenium**

Samples are digested in acid under oxidising conditions, using sealed 'bombs' in automated microwave digestors, to prevent losses of volatile metals/inorganics, Metals (and some inorganics) are then determined by Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) or by Inductively Coupled Plasma Mass Spectrometry (ICP-MS). These techniques allow the sensitive and accurate (true and precise) determination of metals in foods and allow matrix interferences to be overcome.

In house methods - UKAS accredited.

### **Iodide:**

Concentrations are determined by high resolution ICP-MS after extraction with tetra methyl ammonium hydroxide.

UKAS accredited.

### **Chloride:**

Concentrations are determined using a Corning Chloride Analyser after extraction with nitric acid.

In house method FFF/B1-2104 - UKAS accredited.

### **Vitamins – Water Soluble:**

#### **Thiamin, Riboflavin & Vitamin B6**

Thiamin, riboflavin and Vitamin B6 are determined by HPLC after appropriate and controlled acid and enzymatic hydrolysis. The methods are based on published CEN Standards. The selected method enables determination of total B6 as pyridoxine and is most appropriate to samples of this type where pyridoxine or its phosphate will form the major vitamin B6 component.

UKAS accredited.

#### **Niacin, Total Folate, Biotin, Pantothenic acid**

Determined using microbiological assay (MBA) procedures with detection carried out using VitaFast® MBA test kits.

UKAS accredited.

#### **Tryptophan**

Determined by HPLC using fluorescence detection after alkaline hydrolysis. Tryptophan contributes to the available Niacin on the basis that Niacin = Tryptophan/60.

#### **Vitamin B12**

Vitamin B12 is extracted from food by autoclaving in acetate buffer in the presence of cyanide. Vitamin B12 is determined by microbiological assay using *L.Delbrueckii.Lactis*.

UKAS accredited.

The B-vitamin results are expressed as follows:

Thiamin:	thiamin chloride hydrochloride
Riboflavin:	free riboflavin
Niacin:	nicotinic acid
Vitamin B6:	pyridoxine hydrochloride
Pantothenate:	pantothenic acid
Biotin:	d-biotin
B12:	cyanocobalamin
Total folate:	pteroylglutamic acid

#### **Vitamin C**

Vitamin C is determined by HPLC using fluorescence detection.

#### **Oil Soluble Vitamins:**

Vitamins A, D, E and the carotenoids are determined using an in house procedure involving saponification of the sample, solvent extraction and HPLC determination - UKAS accredited methods based on:

## Nutrient analysis of fish and fish products

- Vitamin A – Retinol: BS EN 12823-1:2000. Foodstuffs-Determination of Vitamin A by High Performance Liquid Chromatography-Part 1: Measurement of Retinol
- Vitamin A –  $\beta$ -Carotene: BS EN 12823-2:2000. Foodstuffs-Determination of Vitamin A by High Performance Liquid Chromatography-Part 2: Measurement of  $\beta$ -Carotene
- Vitamin D: BS EN 12821:2000. Foodstuffs-Determination of Vitamin D by High Performance Liquid Chromatography-Measurement of Cholecalciferol (D3) and Ergocalciferol (D2)
- Vitamin E: BS EN 12822:2000. Foodstuffs-Determination of Vitamin E by High Performance Liquid Chromatography-Measurement of  $\alpha$ -,  $\beta$ -,  $\gamma$ - and  $\delta$ -tocopherols

The total vitamin E figure takes into account the relative biological activities of the different isomers. Vitamin E is given as mg/100g of  $\alpha$  - tocopherol equivalent. The activities used for these calculations are as shown below:

$\alpha$ - tocopherol	1.0
$\beta$ - tocopherol	0.4
$\gamma$ - tocopherol	0.1
$\delta$ - tocopherol	0.01

Total vitamin A is expressed as ug/100g all-trans retinol equivalent (ATRE) and is calculated as follows:

All-trans retinol + (0.75\*13-cis retinol) +(  $\beta$ -carotene/6) +(other active carotenoids/12)

UKAS accredited.

# Quality Assurance

Eurofins Laboratories followed standard operating procedures to assure quality of data reported. Procedures are described in the documents listed below.

Document No.	Edition	Title/content
AQC/001	7	Procedures for the establishment of internal quality control charts for AQC samples
AQC/005	5	Procedures for the conduct of external proficiency schemes
AQC/006	4	Storage of chemicals, stock solutions & standards and verification of 'critical reagents'
AQC/011	1	Analytical quality control charts for AQC samples, preparation, interpretation and action
SAMP/031	2	Procedure for managing repeat analyses
DATA/009	9	Manual recording of data and data verification
DATA/016	2	Approval of results in eLIMS

Listed below are details of the analytical methods used in the analysis of proximates and fatty acids and the quality control procedures used. Where any proficiency test results from FAPAS are quoted they are from the rounds near to the time at which analysis was carried out.

## Q/005: The determination of moisture content of food products (UD006)

A homogenised portion of the sample is mixed with sand and heated to 102°C. The moisture loss determined gravimetrically.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

Ref: BS 4401 pt3:1997

LOQ 0.1 g/100g

The method of uncertainty with a coverage factor of 2 (ie 95% confidence level)

Wet pet food is 76.33 g/100g +/- 1.4 g/100g.

### FAPAS Results

Series	Round	Date	Sample Type	Determination	Z score
1	61	1/09	Canned meat meal	Moisture	1.9
1	62	5/09	Canned meat	Moisture	1.4
1	63	8/09	Canned meat	Moisture	-0.1
1	65	12/09	Canned meat	Moisture	-0.8
1	66	1/10	Canned meat meal	Moisture	1.1
1	67	4/10	Canned meat	Moisture	0.6
1	70	7/10	Canned meat	Moisture	1.2
1	71	9/10	Canned meat meal	Moisture	-0.5
1	73	4/11	Canned meat	Moisture	1.3

## Nutrient analysis of fish and fish products

24	32	1/09	Soya Flour	Moisture	-0.3
24	33	2/09	Breadcrumbs	Moisture	-0.1
24	34	5/09	Wheat flour	Moisture	0.2
24	35	8/09	Porridge oats	Moisture	-2.7
24	36	10/09	Cereal	Moisture	-0.8
25	65	1/09	Butter	Moisture	0.0
25	67	4/09	Canned fish	Moisture	0.1
25	68	4/09	Milk powder	Moisture	0.6
25	69	6/09	Snack food	Moisture	0.4
25	70	5/09	Fish paste	Moisture	1.5
25	71	6/09	Condensed milk	Moisture	-1.4
25	74	8/09	Milk powder	Moisture	0.8
25	77	2/10	Cheese & Pasta meal	Moisture	0.7
25	78	2/10	Canned fish	Moisture	-0.5
25	81	6/10	Fish paste	Moisture	-0.5
25	82	9/10	Condensed milk	Moisture	0.1
25	85	10/10	Chocolate	Moisture	0.1
25	90	4/11	Maize snack food	Moisture	-2.0

### Q/002: The determination of the fat content (UD003)

The sample is acid hydrolysed with hydrochloric acid, cooled, filtered and dried. The fat is extract from the residue with petroleum ether and the dried fat determined gravimetrically. Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

Ref: BS 4401 pt4:1970

LOQ 0.1 g/100g

The method of uncertainty with a coverage factor of 2 (ie 95% confidence level)

Wet pet food is 7.34 g/100g +/- 0.36 g/100g.

Dry pet food is 7.34 g/100g +/- 0.22 g/100g.

### FAPAS Results

Series	Round	Date	Sample Type	Determination	Z score
1	61	1/09	Canned meat meal	Total fat	-0.8
1	62	5/09	Canned meat	Total fat	-0.8
1	63	8/09	Canned meat	Total fat	0.4
1	67	4/10	Canned meat	Total fat	-1.3
1	70	7/10	Canned meat	Total fat	-1.5
1	71	9/10	Canned meat meal	Total fat	2.5
1	73	4/11	Canned meat	Total fat	0.5
14	77	1/09	Breakfast cereal	Total fat	-2.5
14	81	5/09	Mixed fat spread	Total fat	0.5

## Nutrient analysis of fish and fish products

14	82	7/09	Infant milk formula	Total fat	0.8
24	35	8/09	Porridge oats	Total fat	0.3
25	65	1/09	Butter	Total fat	-2.1
25	66	2/09	Cheese & pasta meal	Total fat	0.4
25	67	4/09	Canned fish	Total fat	2.4
25	68	4/09	Milk powder	Total fat	0.5
25	69	6/09	Snack food	Total fat	-0.7
25	70	5/09	Fish paste	Total fat	2.5
25	71	6/09	Condensed milk	Total fat	3.0
25	74	8/09	Milk powder	Total fat	2.0
14	93	7/10	Cereal product	Total fat	0.6
14	103	7/11	Cereal product	Total fat	0.5
14	105	8/11	Mixed fat spread	Total fat	0.7

### Q/001: The determination of the ash content. (UD007)

A homogenised portion of the sample is ashed in a muffle furnace at 550°C. The ash is determined gravimetrically.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

Ref: BS 4401 pt11:1998

LOQ 0.1 g/100g

The method of uncertainty with a coverage factor of 2 (ie 95% confidence level)

Dry pet food is 7.18 g/100g +/- 0.18 g/100g.

### FAPAS Results

Series	Round	Date	Sample Type	Determination	Z score
1	61	1/09	Canned meat meal	Ash	0.0
1	62	5/09	Canned meat	Ash	0.3
1	63	8/09	Canned meat	Ash	0.5
1	67	4/10	Canned meat	Ash	0.2
1	70	7/10	Canned meat	Ash	1.0
1	71	9/10	Canned meat meal	Ash	2.4
1	73	4/11	Canned meat	Ash	0.1
24	32	1/09	Soya Flour	Ash	-0.2
24	33	2/09	Breadcrumbs	Ash	0.4
24	34	5/09	Wheat flour	Ash	1.9
24	36	10/09	Cereal	Ash	-0.9
25	66	2/09	Cheese & pasta meal	Ash	0.5
25	67	4/09	Canned fish	Ash	0.4
25	68	4/09	Milk powder	Ash	0.7
25	69	6/09	Snack food	Ash	-0.3
25	70	5/09	Fish paste	Ash	0.7

## Nutrient analysis of fish and fish products

25	71	6/09	Condensed milk	Ash	-0.2
25	74	8/09	Milk powder	Ash	1.3

### Z/001: The determination of nitrogen and crude protein using Leco instrumentation (UD001)

The sample is analysed by a Leco instrumentation following Dumas procedure: The sample is combusted in an oxygen atmosphere, the gaseous product is cleaned and nitrogen compounds converted to nitrogen which is measured by a thermal conductivity cell. The crude protein is calculated by multiplying by the appropriate conversion factor.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

LOQ 0.1 g/100g

The method of uncertainty with a coverage factor of 2 (ie 95% confidence level)

Wet pet food is 8.09 g/100g +/- 0.4 g/100g.

Feed is 2.72 g/100g +/- 0.06 g/100g.

### FAPAS Results

Series	Round	Date	Sample Type	Determination	Z score
1	61	1/09	Canned meat meal	Nitrogen	1.0
1	62	5/09	Canned meat	Nitrogen	-0.6
1	63	8/09	Canned meat	Nitrogen	0.3
1	67	4/10	Canned meat	Nitrogen	0.4
1	70	7/10	Canned meat	Nitrogen	0.9
1	71	9/10	Canned meat meal	Nitrogen	0.8
1	73	4/11	Canned meat	Nitrogen	0.8
24	32	1/09	Soya Flour	Nitrogen	0.0
24	33	2/09	Breadcrumbs	Nitrogen	-0.2
24	34	5/09	Wheat flour	Nitrogen	0.3
24	35	8/09	Porridge oats	Nitrogen	0.6
24	36	10/09	Cereal	Nitrogen	0.2
25	66	2/09	Cheese & pasta meal	Nitrogen	0.4
25	67	4/09	Canned fish	Nitrogen	0.8
25	68	4/09	Milk powder	Nitrogen	0.7
25	69	6/09	Snack food	Nitrogen	0.1
25	70	5/09	Fish paste	Nitrogen	0.8
25	71	6/09	Condensed milk	Nitrogen	0.4
25	74	8/09	Milk powder	Nitrogen	0.9

### H/085: The determination of total dietary fibre by the AOAC method ((H/085)

The sample is weighed and de-fatted if necessary. It is then gelatinised and treated with  $\alpha$ -amylase and further digested enzymatically with protease and amyloglucosidase to remove the starch and protein. The dietary fibre is precipitated with IMS, filtered, washed, dried and weighed. Total dietary fibre is then determined gravimetrically and corrected for protein and ash.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

## Nutrient analysis of fish and fish products

Ref: AOAC 985.29/45.4.07 (2007)

LOQ 0.5 g/100g

The method of uncertainty with a coverage factor of 2 (ie 95% confidence level)

Weetabix cereal is 10.72 g/100g +/- 1.07 g/100g.

### FAPAS Results

Series	Round	Date	Sample Type	Determination	Z score
24	33	2/09	Breadcrumbs	AOAC fibre	0.3
24	34	5/09	Wheat flour	AOAC fibre	0.3
24	35	8/09	Porridge oats	AOAC fibre	0.6
24	36	10/09	Cereal	AOAC fibre	0.4

### CHROM/104: The determination of extractable sugars (UD296)

The sugars are extracted with water, clarified and chromatographically separated on an amine column with an acetonitrile/water mobile phase. The sugars are detected using an evaporative light scattering detector and quantified with reference to calibration standards.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

LOQ 0.1 g/100g

The method of uncertainty with a coverage factor of 2 (ie 95% confidence level)

Sugar	Matrix	Level	Uncertainty ±	Unit
Sugar (total)	Cornflakes	26.10	1.59	g/100g
Fructose	Cornflakes	5.22	0.58	g/100g
Glucose	Cornflakes	5.12	0.60	g/100g
Galactose	Cornflakes	4.00	0.58	g/100g
Sucrose	Cornflakes	4.01	0.68	g/100g
Maltose	Cornflakes	4.00	0.78	g/100g
Lactose	Cornflakes	3.75	0.64	g/100g

### FAPAS Results

Series	Round	Date	Sample Type	Determination	Z score
8	33	10/09	Orange juice	Fructose	-1.8
8	33	10/09	Orange juice	Glucose	-4.8
8	33	10/09	Orange juice	Sucrose	-2.6
8	33	10/09	Orange juice	Total sugars	-3.8
20	65	1/09	Chocolate cake mix	total sugars	-0.4
25	74	8/09	Milk powder	Lactose	-0.4
1	71	9/10	Canned meat meal	total sugars	-0.4

### H/050: The determination of Starch (UD012)

## Nutrient analysis of fish and fish products

Determination of starch and high molecular weight degradation products of starch in feeding stuffs and milk powders. It is not applicable to feeding stuffs containing beet chips, beet pulp, dried beet tops or leaves, potato pulp, dried yeasts, products rich in inulin (e.g. dried or powdered Jerusalem artichokes) and products containing greaves.

The method consists of two separate determinations. The sample is treated with warm diluted hydrochloric acid, clarified and filtered; the optical rotation of the resulting solution is determined. In the second determination, the sample is extracted with 40% ethanol and filtered. The filtrate is acidified with hydrochloric acid, clarified and filtered again; the optical rotation of the resulting solution is determined at  $20 \pm 2^\circ\text{C}$ .

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

Ref: The Feeding Stuffs (Sampling and Analysis) Regulations 1982 Method 30a.

LOQ 2 g/100g

The method of uncertainty with a coverage factor of 2 (ie 95% confidence level)

Wheat grain is 68.8 g/100g +/- 1.50 g/100g.

### FAPAS Results

Series	Round	Date	Sample Type	Determination	Z score
10	77	1/09	Poultry ration	Starch	0.4
1	66	1/10	Canned meat meal	Starch	-0.2

### CHROM/215: The determination of fatty acids by GC (UD751)

The lipid fractions of the sample are solvent extracted. The isolated fat is transesterified with methanolic sodium methoxide to form fatty acid methyl esters (FAMES). The FAME profile is determined using capillary gas chromatography (GC). Quantification and identification of individual FAMES in the test material is achieved with reference to calibration standards.

Accredited to BS/EN ISO/IEC 17025:2005. UKAS 0680

LOQ 0.01 mg/100g

The method of uncertainty with a coverage factor of 2 (ie 95% confidence level)

Fatty Acid	Matrix	Level	Uncertainty $\pm$	Unit
FAMES-saturates	Butter	63.6	1.60	%
FAMES-monounsaturates	Butter	26.2	1.00	%
FAMES-polyunsaturates	Butter	3.88	0.26	%
FAMES-trans fatty acids	Butter	2.95	0.20	%
alpha-linolenic acid (ALA)	Butter	0.524	0.046	%
Eicosapentaenoic acid (EPA)	Butter	0.42	0.040	%
Docosapentaenoic acid (DPA)	Butter	0.12	0.014	%
Docosahexaenoic acid (DHA)	Butter	0.472	0.042	%

### FAPAS Results

Series	Round	Date	Sample Type	Determination	Z score
14	77	1/09	Breakfast cereal	Total TFA	0.0
14	77	1/09	Breakfast cereal	linoleic acid	-0.2

## Nutrient analysis of fish and fish products

14	78	1/09	vegetable oil	Saturates	0.5
14	78	1/09	vegetable oil	Monounsaturates	-0.1
14	78	1/09	vegetable oil	Polyunsaturates	0.0
14	77	1/09	Breakfast cereal	Total TFA	0.0
14	80	4/09	Fortified oil	Saturates	0.0
14	80	4/09	Fortified oil	Monounsaturates	-0.4
14	80	4/09	Fortified oil	Polyunsaturates	0.5
14	80	4/09	Fortified oil	Total TFA	-0.2
14	80	4/09	Fortified oil	linoleic acid	-0.1
14	81	5/09	Mixed fat spread	Saturates	0.0
14	81	5/09	Mixed fat spread	Monounsaturates	-0.1
14	81	5/09	Mixed fat spread	Polyunsaturates	-0.2
14	84	8/09	Cod liver oil	Linoleic acid	-1.2
14	84	8/09	Cod liver oil	EPA	-0.4
14	84	8/09	Cod liver oil	DHA	-1.7
14	87	11/09	Mixed fat spread	Saturates	0.4
14	87	11/09	Mixed fat spread	Monounsaturates	-0.1
14	87	11/09	Mixed fat spread	Polyunsaturates	-0.3
14	87	11/09	Mixed fat spread	Total TFA	0
14	87	11/09	Mixed fat spread	Linoleic acid	0
14	87	11/09	Mixed fat spread	EPA	0.7
14	87	11/09	Mixed fat spread	DHA	0.2
14	88	1/10	Vegetable oil	Saturates	0
14	88	1/10	Vegetable oil	Monounsaturates	0
14	88	1/10	Vegetable oil	Polyunsaturates	0.4
14	89	2/10	Olive oil	Saturates	0.5
14	89	2/10	Olive oil	Monounsaturates	-0.1
14	89	2/10	Olive oil	Polyunsaturates	0.3
14	89	2/10	Olive oil	Total TFA	-2.0
14	89	2/10	Olive oil	Linoleic acid	-0.2
14	89	2/10	Olive oil	EPA	-0.3
14	89	2/10	Olive oil	DHA	-1.5
14	89	2/10	Olive oil	Palmitic acid	1.0
14	89	2/10	Olive oil	Stearic acid	-0.3
14	89	2/10	Olive oil	Oleic acid	-1.3
14	89	2/10	Olive oil	DPA	-1.7
14	93	07/10	Cereal product	Saturates	1.1

## Nutrient analysis of fish and fish products

14	93	07/10	Cereal product	Monounsaturates	0.7
14	93	07/10	Cereal product	Polyunsaturates	-0.2
14	93	07/10	Cereal product	Linoleic acid	-0.2
14	93	07/10	Cereal product	Myristic acid	1.8
14	93	07/10	Cereal product	Palmitic acid	-0.2
14	93	07/10	Cereal product	Stearic acid	-0.2
14	93	07/10	Cereal product	Oleic acid	-0.3
14	93	07/10	Cereal product	Total TFA	0.5
14	95	08/10	Mixed fat spread	Saturates	0.3
14	95	08/10	Mixed fat spread	Monounsaturates	-0.1
14	95	08/10	Mixed fat spread	Polyunsaturates	-0.5
14	95	08/10	Mixed fat spread	Total TFA	0.1
14	96	10/10	Fish oil	EPA	-1.2
14	96	10/10	Fish oil	DHA	-1.5
14	101	05/11	Infant Milk formula	Saturates	0.4
14	101	05/11	Infant Milk formula	Monounsaturates	0.5
14	101	05/11	Infant Milk formula	Polyunsaturates	0.5
14	101	05/11	Infant Milk formula	Total TFA	0.5
14	101	05/11	Infant Milk formula	Linoleic acid	0.4
14	101	05/11	Infant Milk formula	DHA	-0.8
14	103	07/11	Cereal product	Saturates	-1.5
14	103	07/11	Cereal product	Monounsaturates	0.8
14	103	07/11	Cereal product	Polyunsaturates	0.9
14	103	07/11	Cereal product	Total TFA	-2.3
14	103	07/11	Cereal product	Linoleic acid	1.6
14	105	08/11	Mixed fat spread	Saturates	-0.7
14	105	08/11	Mixed fat spread	Monounsaturates	0.3
14	105	08/11	Mixed fat spread	Polyunsaturates	0.3
14	105	08/11	Mixed fat spread	Total TFA	-0.4

### A7335 Cholesterol

Method Lipid in sample is saponified at high temperature with ethanolic KOH solution. Unsaponifiable fraction containing cholesterol and other sterols is extracted with toluene. Sterols are derivatized to trimethylsilyl (TMS) ethers and then quantified by GC.

## Nutrient analysis of fish and fish products

LOQ 0.7 mg/100 g

Reproducibility 20%

Reference Method ISO 6799: 1992

### Ring Test Proficiency Results

Number	Date	Sample Type	Determination	Z score
0249/0325	06/01/11	Cake PTS3	Cholesterol	1.0
0249/326	06/01/11	Salted butter	Cholesterol	0.9
0250/0096	01/02/11	Ham	Cholesterol	-0.7
0250/0095	01/02/11	Chicken	Cholesterol	-0.4
0250/0094	01/02/11	Fish	Cholesterol	-0.8
0253/1384	04/05/11	Chicken	Cholesterol	-2.0
1257/0431	24/10/11	Chicken	Cholesterol	-1.2
1257/0437	24/10/11	Fish	Cholesterol	-1.1
0259/2858	15/11/11	Ham	Cholesterol	0.0

Listed below are details of the analytical methods used in the analysis of inorganics and vitamins and the quality control procedures used with results from reference material measurements during sample analysis.

### Inorganics:

#### Sodium, Potassium, Calcium, Magnesium, Copper, Iron, Manganese, Zinc, Phosphorus, Selenium

Samples are digested in acid under oxidising conditions, using sealed 'bombs' in automated microwave digestors, to prevent losses of volatile metals/inorganics, Metals (and some inorganics) are then determined by Inductively Coupled Plasma Optical Emission Spectrometry (ICP-OES) or by Inductively Coupled Plasma Mass Spectrometry (ICP-MS). These techniques allow the sensitive and accurate (true and precise) determination of metals in foods and allow matrix interferences to be overcome.

In house methods - UKAS accredited.

#### Sodium

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SRM 1457	Peach leaves	24±2	42.2
SRM 1457	Peach leaves	24±2	45.1
SRM 1457	Peach leaves	24±2	42.6
SRM 1457	Peach leaves	24±2	43.7
SRM 1457	Peach leaves	24±2	34.7

#### Potassium

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SRM 1457	Peach leaves	24300±300	23780
SRM 1457	Peach leaves	24300±300	23480
SRM 1457	Peach leaves	24300±300	24020
SRM 1457	Peach leaves	24300±300	23780
SRM 1457	Peach leaves	24300±300	23160

## Nutrient analysis of fish and fish products

### Calcium

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SRM 1457	Peach leaves	15600±200	15180
SRM 1457	Peach leaves	15600±200	15090
SRM 1457	Peach leaves	15600±200	15230
SRM 1457	Peach leaves	15600±200	15100
SRM 1457	Peach leaves	15600±200	14970

### Magnesium

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SRM 1457	Peach leaves	4320±80	4150
SRM 1457	Peach leaves	4320±80	4190
SRM 1457	Peach leaves	4320±80	4150
SRM 1457	Peach leaves	4320±80	4100
SRM 1457	Peach leaves	4320±80	4150

### Copper

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SRM 1457	Peach leaves	3.7±0.4	3.6
SRM 1457	Peach leaves	3.7±0.4	3.5
SRM 1457	Peach leaves	3.7±0.4	3.6
SRM 1457	Peach leaves	3.7±0.4	3.4
SRM 1457	Peach leaves	3.7±0.4	3.5

### Iron

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SRM 1457	Peach leaves	218±14	207
SRM 1457	Peach leaves	218±14	203
SRM 1457	Peach leaves	218±14	207
SRM 1457	Peach leaves	218±14	206
SRM 1457	Peach leaves	218±14	210

### Manganese

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SRM 1457	Peach leaves	98±3	96.4
SRM 1457	Peach leaves	98±3	96.4
SRM 1457	Peach leaves	98±3	96.6
SRM 1457	Peach leaves	98±3	94.3
SRM 1457	Peach leaves	98±3	95.3

### Zinc

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SRM 1457	Peach leaves	17.9±0.4	16.5

## Nutrient analysis of fish and fish products

SRM 1457	Peach leaves	17.9±0.4	16.6
SRM 1457	Peach leaves	17.9±0.4	17.1
SRM 1457	Peach leaves	17.9±0.4	16.7
SRM 1457	Peach leaves	17.9±0.4	16.5

### Phosphorus

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SRM 1457	Peach leaves	1370±70	1360
SRM 1457	Peach leaves	1370±70	1370
SRM 1457	Peach leaves	1370±70	1370
SRM 1457	Peach leaves	1370±70	1370
SRM 1457	Peach leaves	1370±70	1370

### Selenium

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SRM 1457	Peach leaves	120±9	151
SRM 1457	Peach leaves	120±9	150
SRM 1457	Peach leaves	120±9	173
SRM 1457	Peach leaves	120±9	142
SRM 1457	Peach leaves	120±9	145

### Iodide:

Concentrations are determined by high resolution ICP-MS after extraction with tetra methyl ammonium hydroxide.

UKAS accredited.

Reference Material	Matrix	Expected Level (µg/g)	Iodide (µg/g)
NIST 1849	Infant formula	1370±410	1446
NIST 1849	Infant formula	1370±410	1435

### Chloride:

Concentrations are determined using a Corning Chloride Analyser after extraction with nitric acid.

In house method FFF/B1-2104 - UKAS accredited.

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
SMRD 2000	Swedish meat	2.19±0.13	2.15
SMRD 2000	Swedish meat	2.19±0.13	2.19

### Vitamins – Water Soluble:

The B-vitamin results are expressed as follows:

Thiamin: thiamin chloride hydrochloride

Riboflavin: free riboflavin

Niacin: nicotinic acid

Vitamin B6: pyridoxine hydrochloride

Pantothenate: pantothenic acid

## Nutrient analysis of fish and fish products

Biotin: d-biotin  
B12: cyanocobalamin  
Total folate: pteroylglutamic acid

### Thiamin, Riboflavin & Vitamin B6

Thiamin, riboflavin and Vitamin B6 are determined by HPLC after appropriate and controlled acid and enzymatic hydrolysis. The methods are based on published CEN Standards. The selected method enables determination of total B6 as pyridoxine and is most appropriate to samples of this type where pyridoxine or its phosphate will form the major vitamin B6 component.

UKAS accredited.

#### Thiamin

Reference Material	Matrix	Expected Level (mg/kg)	Thiamin (mg/kg)
NIST 1849	Infant formula	15.800±1.95	15.1
NIST 1849	Infant formula	15.800±1.95	163

#### Riboflavin

Reference Material	Matrix	Expected Level (mg/kg)	Riboflavin (mg/kg)
NIST 1849	Infant formula	17.400±1.50	17.8
NIST 1849	Infant formula	17.400±1.50	17.8

#### Vitamin B6

Reference Material	Matrix	Expected Level (mg/kg)	Vitamin B6 (mg/kg)
NIST 1849	Infant formula	14.2±2.25	14.5
NIST 1849	Infant formula	14.2±2.25	15.9

### Niacin, Total Folate, Biotin, Pantothenic acid

Determined using microbiological assay (MBA) procedures with detection carried out using VitaFast® MBA test kits.

UKAS accredited.

#### Niacin

Reference Material	Matrix	Expected Level (mg/kg)	Niacin (mg/kg)
NIST 1849	Infant formula	97.5±11.7	99.4
NIST 1849	Infant formula	97.5±11.7	87.9
NIST 1849	Infant formula	97.5±11.7	91.2
NIST 1849	Infant formula	97.5±11.7	96.4

#### Folate

Reference Material	Matrix	Expected Level (mg/kg)	Folate (mg/kg)
NIST 1849	Infant formula	2.11±0.195	2.106
NIST 1849	Infant formula	2.11±0.195	2.015
NIST 1849	Infant formula	2.11±0.195	2.158
NIST 1849	Infant formula	2.11±0.195	2.201

### Biotin

Reference Material	Matrix	Expected Level (mg/kg)	Biotin (mg/kg)
NIST 1849	Infant formula	1.920±0.375	1.945
NIST 1849	Infant formula	1.920±0.375	1.992
NIST 1849	Infant formula	1.920±0.375	1.895
NIST 1849	Infant formula	1.920±0.375	1.934

### Pantothenate

Reference Material	Matrix	Expected Level (mg/kg)	Pantothenate (mg/kg)
NIST 1849	Infant formula	64.8±3.3	65.1
NIST 1849	Infant formula	64.8±3.3	69.0
NIST 1849	Infant formula	64.8±3.3	58.0
NIST 1849	Infant formula	64.8±3.3	62.1

### Tryptophan

Determined by HPLC using fluorescence detection after alkaline hydrolysis. Tryptophan contributes to the available Niacin on the basis that Niacin = Tryptophan/60.

Reference Material	Matrix	Expected Level (mg/kg)	Tryptophan (mg/kg)
NIST 1849	Infant formula	1880±15	1850
NIST 1849	Infant formula	1880±15	1961
NIST 1849	Infant formula	1880±15	1998
NIST 1849	Infant formula	1880±15	1924

### Vitamin B12

Vitamin B12 is extracted from food by autoclaving in acetate buffer in the presence of cyanide. Vitamin B12 is determined by microbiological assay using *L.Delbrueckii.Lactis*. UKAS accredited.

Reference Material	Matrix	Expected Level (mg/kg)	Vitamin B12 (mg/kg)
NIST 1849	Infant formula	0.041±0.012	0.045
NIST 1849	Infant formula	0.041±0.012	0.044

### Vitamin C

Vitamin C is determined by HPLC using fluorescence detection.

Reference Material	Matrix	Expected Level (mg/kg)	Vitamin C (mg/kg)
NIST 1849	Infant formula	1060±30	1080

### Oil Soluble Vitamins:

Vitamins A, D, E and the carotenoids are determined using an in house procedure involving saponification of the sample, solvent extraction and HPLC determination - UKAS accredited methods based on:

- Vitamin A – Retinol: BS EN 12823-1:2000. Foodstuffs-Determination of Vitamin A by High Performance Liquid Chromatography-Part 1: Measurement of Retinol

## Nutrient analysis of fish and fish products

- Vitamin A –  $\beta$ -Carotene: BS EN 12823-2:2000. Foodstuffs-Determination of Vitamin A by High Performance Liquid Chromatography-Part 2: Measurement of  $\beta$ -Carotene
- Vitamin D: BS EN 12821:2000. Foodstuffs-Determination of Vitamin D by High Performance Liquid Chromatography-Measurement of Cholecalciferol (D3) and Ergocalciferol (D2)
- Vitamin E: BS EN 12822:2000. Foodstuffs-Determination of Vitamin E by High Performance Liquid Chromatography-Measurement of  $\alpha$ -,  $\beta$ -,  $\gamma$ - and  $\delta$ -tocopherols  
UKAS accredited.

### Vitamin A

Reference Material	Matrix	Expected Level ( $\mu\text{g}/\text{kg}$ )	Measured Level ( $\mu\text{g}/\text{kg}$ )
BCR-122	Margarine	7.660 $\pm$ 1.650	7.93
BCR-122	Margarine	7.660 $\pm$ 1.650	8.49
BCR-122	Margarine	7.660 $\pm$ 1.650	8.62
BCR-122	Margarine	7.660 $\pm$ 1.650	8.61
BCR-122	Margarine	7.660 $\pm$ 1.650	8.74
BCR-122	Margarine	7.660 $\pm$ 1.650	7.66

### Beta-carotene

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
BCR-485	Mixed vegetables	25.6 $\pm$ 1.8	21.8

### Alpha-carotene

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
BCR-485	Mixed vegetables	9.8 $\pm$ 1.05	9.0

### Lutein

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
BCR-485	Mixed vegetables	12.5 $\pm$ 1.2	11.9

### Vitamin D

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
BCR-122	Margarine	0.125 $\pm$ 0.036	0.117
BCR-122	Margarine	0.125 $\pm$ 0.036	0.113
BCR-122	Margarine	0.125 $\pm$ 0.036	0.116

### Vitamin E

Reference Material	Matrix	Expected Level (mg/kg)	Measured Level (mg/kg)
BCR-122	Margarine	241 $\pm$ 54	251.9
BCR-122	Margarine	241 $\pm$ 54	274.3
BCR-122	Margarine	241 $\pm$ 54	220.5
BCR-122	Margarine	241 $\pm$ 54	276.2
BCR-122	Margarine	241 $\pm$ 54	242.5
BCR-122	Margarine	241 $\pm$ 54	244.6

# References

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<sup>1</sup> Responsibility for nutrition policy in England transferred from the Food Standards Agency to the Department of Health (DH) on 1<sup>st</sup> October 2010. Management of the rolling programme of nutrient analysis also transferred to DH.