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SURVEY OF METALS AND OTHER ELEMENTS IN PROCESSED FISH AND SHELLFISH

Summary

The Food Standards Agency (FSA) has conducted a survey of heavy metals in processed fish and shellfish. A total of 165 samples of processed fish and fish products were analysed for aluminium, arsenic, cadmium, chromium, copper, iron, lead manganese, mercury, nickel, selenium, thallium, tin and zinc.

The aim of this survey was to supplement the information available for unprocessed fish by providing up-to-date information on the concentrations of heavy metals in processed fish and shellfish and to allow more accurate and detailed dietary intake estimates of metals and other elements by consumers of fish and shellfish products.

The key facts of this survey are:

- **Concentrations of 14 metals and elements were measured in 165 samples of processed fish and fish products.**
- **Samples analysed included crustaceans, molluscs, canned fish, dried/salted fish and highly processed fish.**
- **Levels of contaminants were found to be similar to those reported in previous studies.**
- **The survey does not raise new safety concerns. The levels of mercury present in some samples reinforce existing Food Standards Agency advice on consumption of swordfish and tuna.**

Background

Inorganic environmental contaminants, such as heavy metals, are present in food adventitiously as a result of human activity or arise from natural sources. These contaminants may be introduced at any point along the food chain. In many cases, food is the main source of consumer exposure to inorganic contaminants, although other routes may also be significant, e.g., through inhalation of air or drinking water. Certain types of food are known to accumulate heavy metals, e.g., arsenic and mercury in fish ^[1,2].

Although some metals and their compounds are essential to human health (i.e., copper, chromium and zinc), they are potentially harmful if consumed in large quantities. Other metals may be harmful to health, for example, arsenic has no known beneficial biological function and long-term exposure may be harmful to health.

Levels of many inorganic contaminants in the general diet have decreased over the past 25 years ^[3]. However, there is concern that levels of naturally occurring elements, such as mercury and arsenic, may still be present in the diet at relatively high levels as a result of the consumption of certain food types.

Brand Names

In accordance with the FSA policy for the release of brand names when reporting the results of food chemical surveillance, details about the individual retail samples are given in full in Annex 1. It should be noted that the absence of any particular brand from this survey means only that the brand was not included in the survey. No further meaning should be read into the absence of any brand from this Food Survey Information Sheet.

Methodology

Sampling

Ventress Technical Limited collected 165 samples of processed fish and shellfish from across the UK between April and June, 2005; 115 samples were collected in England, 20 in Scotland, 15 in Wales and 15 in Northern Ireland. Samples were collected from a range of retail outlets including supermarkets, smaller shops and specialist retailers such as fish mongers and mail-order companies.

A range of products was sampled: molluscs (including whelks, mussels, winkles, scallops, squid), crustaceans (including shrimps, prawns, crevettes/king prawns, crab, crayfish, lobster), ready-to-eat highly processed fish products (including crab sticks, sandwich fillers, pâtés, soups), canned/jarred products (including fish in oil, brine, tomato sauce), high content enrobed products (including battered fish, fish fingers, fish cakes), smoked/salted/dried fish (including smoked salmon, kippers) and specialist fish products (including caviar, cod roe, jellied eels). The choice of samples aimed to reflect both market share as well as the range of products available. This survey represents a snap shot of the market and no inference should be drawn from the inclusion of a particular brand or product.

The product description, pack size, country of origin, manufacturers contact information, manufacturing code details (shelf life and batch codes) and retailer information was recorded for each sample. These data are summarised in Annex 1 and presented fully in the contractor's report ^[4].

All samples were analysed "as sold". Samples were homogenised by Central Science Laboratory (CSL) to produce four sub-samples. Two of each set of sub-samples were sent to Ecochem for analysis; one sub-sample was analysed, while the second was stored at -20 °C until further required. The remaining sub-samples were kept at CSL for analysis of dioxins and PCB, which are reported separately.

Ecochem analysed the processed fish and shellfish via a variety of different methods. Prior to analysis, each sub-sample was digested in a concentrated mixture of nitric acid and hydrogen peroxide. The analytical methods used included inductively coupled plasma-optical emission spectrometry for iron, atomic absorption spectrometry for mercury and inductively coupled plasma-mass spectrometry for all other metals of interest.

Quality Assurance

Each batch of analysed samples included a sample blank, a spiked blank and a certified reference material. Samples were also analysed in duplicate for quality control purposes. Table 1 shows the limits of detection (LOD) and limits of quantitation (LOQ) for each element monitored in this study.

The Czech Accreditation Institute accredits Ecochem, and both CSL and Ecochem regularly take part in proficiency testing. Further details of the analyses are given in the contractor's final report ^[5], which is available from the FSA library (see Further Information).

Results

A summary of the results is given in Table 2. The measurement uncertainty for each result is estimated as $\pm 20\%$ of each measurement. Results are grouped according to type of fish/shellfish. The number of samples and the levels of each element measured are shown. Individual sample results are listed in Annex 2, where results are again grouped according to type of fish. In this survey, we have not observed any effects of processing on the levels of contaminants present in products. The levels of contaminants in the samples are more closely related to the type, and amount, of fish present.

All results were compared to the limits set by Commission Regulation (EC) No. 466/2001, as amended by Commission Regulations 221/2002 and 78/2005, which sets maximum limits for certain contaminants in foods. Only one sample was found that might have exceeded the regulatory limits: one sample of tinned tuna was found to have a cadmium concentration of 0.11 mg/kg (the limit for cadmium in tuna is 0.1 mg/kg). Owing to a measurement uncertainty of $\pm 20\%$, the cadmium level in this sample of tuna lies in the range 0.09 – 0.13 mg/kg. Regulatory limits for contaminants in fish apply to fresh produce: processing, such as canning, may affect the concentrations of contaminants. Brand owners of products found to have high levels of contaminants were informed and invited to comment on their results (see Annex 3).

High levels of cadmium were found in samples of crab. There is no regulatory limit for the level of cadmium in brown crab meat. This exclusion results from the inherently high levels of cadmium found in brown crab meat and the low consumption of this meat. All of the crab products sampled contained some brown meat.

Arsenic, Cadmium, Lead and Mercury

The highest levels of arsenic (30.84 mg/kg) and cadmium (3.7 mg/kg) were both found in individual samples of crab. High levels of arsenic and cadmium were also evident in samples of molluscs and cephalopods. Crab sticks were found to have low levels of cadmium. However, these highly processed fish products have very little crab content. The highest level of lead was found in a sample of winkles (1.2 mg/kg). These gastropods are not subject to Commission Regulations; however the level of lead is less than the corresponding regulatory limit for bivalve molluscs (1.5 mg/kg). Levels of lead were found to be highest in molluscs (bivalves and gastropods). Samples of skipjack tuna contained the two highest levels of mercury (0.44 and 0.29 mg/kg, respectively). The third highest level of mercury was found in a sample of swordfish (0.27 mg/kg). For almost all other samples, the levels of mercury were low and in most cases were below the LOQ (the level below which a measurement cannot be accurately quantified).

Aluminium, Chromium, Copper and Nickel

The highest levels of aluminium were found in molluscs, with one sample of cockles having an aluminium concentration of 180.00 mg/kg. Chromium levels were greatest in molluscs, with one sample of winkles having a chromium concentration of 0.9 mg/kg; levels of chromium were also high in anchovies, but were otherwise quite low. Copper concentrations ranged from 0.108 – 46.091 mg/kg, the highest concentration being found in a sample of lobster; crustaceans are known to contain high levels of copper as copper is used in their circulatory system. Levels of nickel were generally low. The highest level of nickel was found in a sample of cockles (4.7 mg/kg).

Selenium, Thallium, Tin and Zinc

Levels of selenium were very low; the highest level (1.7 mg/kg) was found in a sample of crab claws. All samples, except two, had levels of thallium below the LOQ. Levels of tin were similarly low, with only 16 samples having levels above the LOQ. The highest levels of zinc were found in molluscs and crab meat, with the greatest (190.00 mg/kg) being found in a sample of oysters.

Iron and Manganese

Levels of iron and manganese were generally quite low. One sample of cockles was found to have the highest level of iron (410 mg/kg) while a sample of winkles was found to

have the greatest level of manganese (15.00 mg/kg). The highest levels of both iron and manganese were found in molluscs.

Comparison to other surveys

Previous surveys conducted by the FSA have looked at the levels of arsenic, cadmium, lead and mercury in unprocessed fish and shellfish. The levels of arsenic in this survey are similar to those previously reported ^[2,6,7]. In accordance with our 2004 survey of arsenic in the diet ^[2], the highest levels of arsenic were found in crustaceans, bivalve molluscs and gastropods.

Levels of cadmium and lead were found to be consistent with those found in earlier studies ^[8,9]. Levels of mercury were also similar to those reported previously ^[1,7,8], with elevated levels being detected in samples of tuna and swordfish — predatory fish are known to accumulate higher levels of mercury in comparison to other types of fish.

Estimation of Dietary Exposures

Many of the fish and shellfish products investigated in this survey are not consumed on a regular basis and thus there are insufficient consumption data from the National Diet and Nutrition Survey to make an assessment. In order to estimate dietary exposures, the average contaminant intake from eating one portion of processed fish or fish/shellfish product per week was calculated. The portion size was taken to be the average amount of fish that it is considered an adult might consume in a single meal event ^[9]. These estimates are listed in Table 3 and are consistent with data used in the latest FSA fish surveys.

High levels of mercury were found in samples of tuna and swordfish. These levels were consistent with those found in a recent survey of mercury in fish and shellfish ^[1]. Predatory fish, such as tuna and swordfish, are known to accumulate high levels of mercury. Consuming one portion per week of either the tuna or swordfish containing the highest levels of mercury analysed in this survey would cause around one third of the provisional tolerable weekly intake (PTWI) to be reached. The UK independent experts, the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment has advised on amounts of fish that can be eaten without adverse effects from their mercury content and the results of this survey do not indicate a need for revision of that advice ^[11].

Levels of cadmium were found to be very high in crab meat and other shellfish. The highest level of cadmium was found in a sample of dressed crab. Consumption of one portion of crab per week with a cadmium concentration of 3.701 mg/kg causes over half of the PTWI for cadmium to be attained. The second highest level of cadmium was found in a sample of crab spread (3.078 mg/kg). Consumption of one portion of this crab spread per week would lead to 18 % of the PTWI for cadmium being attained. Brown crab meat is known to contain high levels of cadmium and is excluded from legislation that sets limits for the levels of cadmium in food. Any risks of dietary exposure to cadmium are associated with intakes over many years. Taking into account the cadmium present in the rest of the diet, long-term average intake from cadmium in dressed crab and crab spread as part of a balanced diet is not expected to be harmful to health.

One sample of crab was found to have the highest level of arsenic. Arsenic may exist in two forms in food: inorganic arsenic or organic arsenic. Inorganic arsenic is the more toxic, whilst organic arsenic is most predominant in the diet. Arsenic in fish is mostly organic arsenic, only 5 % is found as inorganic arsenic^[6]. Assuming that 5 % of the total arsenic measured in the crab claws was inorganic arsenic, consumption of one portion would lead to 10.3 % of the PTWI for inorganic arsenic being attained.

Estimated intakes for the other elements measured during this survey are low and do not cause concern for consumer safety.

Conclusions

There is no evidence to suggest that different methods of processing affect the levels of contaminants present in fish and fish products. The levels of contaminants present in samples were more dependent on the type of fish rather than the type of processing. In general, levels of elements were found to be low. However, high levels of cadmium were observed in crab meat. Crustaceans, and molluscs were found to contain the highest levels of most contaminants.

The results of this survey do not raise new safety concerns. Based on mercury content of these fish species, the FSA advises that pregnant women, women who intend to become pregnant, infants and children under 16 years of age should avoid eating shark, swordfish and marlin and limit the amount of tuna they eat to no more than two fresh tuna steaks or four medium-size cans. Consumption of one portion per week of shark, swordfish or

marlin by other adults is unlikely to result in harmful effects. The levels of other elements reported in this survey do not raise concerns for health.

Summary of units

mg	milligram — one thousandth of a gram
kg	kilogram — one thousand grams
µg	microgram — one millionth of a gram
kg bw	kilograms of body weight

References

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20. WHO (1983): Toxicological evaluation of certain food additives: iron. WHO food additives series, No. 18

Further Information

The final reports of this survey are held in the library and information centre at the Food Standards Agency. If you would like to consult or receive a copy, please contact:

Library and Information Centre
Food Standards Agency
Ground Floor, Aviation House
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Table 1 Limits of detection and quantitation for metals and other elements

Element	Limit of detection (mg/kg)	Limit of quantitation (mg/kg)
Aluminium	0.08	0.25
Arsenic	0.016	0.05
Cadmium	0.0016	0.005
Chromium	0.016	0.05
Copper	0.0016	0.005
Iron	0.33	1
Lead	0.003	0.01
Manganese	0.003	0.01
Mercury	0.0066	0.02
Nickel	0.016	0.05
Selenium	0.066	0.2
Tin	0.033	0.1
Thallium	0.0016	0.005
Zinc	0.066	0.20

Table 2 Summary of results by type of fish/shellfish

Type of fish	Number of samples		Average concentration of element (mg/kg)													
			Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Tl	Zn
Anchovy	2	Mean	4.10	0.98	0.023	0.42	1.484	28	0.05	5.04	0.07	0.09	0.5	0.2	< 0.005	17.4
		Min	4.02	0.72	0.017	0.29	1.08	22	0.03	3.94	< 0.05	0.03	0.4	< 0.1	< 0.005	13.69
		Max	4.18	1.24	0.029	0.55	1.89	33	0.08	6.14	0.10	0.15	0.6	0.2	< 0.005	21.09
Cod	3	Mean	1.48	2.06	0.007	0.23	0.558	7	0.03	1.48	0.08	0.05	0.3	< 0.1	< 0.005	5.00
		Min	0.60	0.78	< 0.005	0.13	0.493	6	0.03	1.40	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	3.00
		Max	2.93	3.60	0.010	0.34	0.640	8	0.03	1.60	0.09	0.13	0.5	< 0.1	< 0.005	8.61
Crab	12	Mean	1.90	7.06	1.066	0.10	14.918	19	0.06	2.12	0.06	0.04	0.7	< 0.1	< 0.005	45.39
		Min	0.75	0.08	< 0.005	< 0.05	0.219	4	< 0.02	0.18	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	2.03
		Max	4.43	30.84	3.701	0.20	33.524	94	0.13	6.27	0.11	0.08	1.7	< 0.1	< 0.005	175.35
Haddock	5	Mean	0.27	3.95	< 0.005	0.13	0.197	2	0.06	0.13	0.07	< 0.01	< 0.2	< 0.1	< 0.005	2.22
		Min	< 0.25	2.89	< 0.005	< 0.05	0.108	< 1	0.03	0.07	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	0.47
		Max	0.36	5.40	< 0.005	0.18	0.282	3	0.08	0.25	0.14	0.02	0.3	< 0.1	< 0.005	3.50
Herrings	7	Mean	0.38	1.24	0.006	0.11	0.914	9	0.03	0.42	0.05	< 0.01	0.3	0.2	< 0.005	7.56
		Min	< 0.25	0.71	< 0.005	0.10	0.745	5	< 0.02	0.21	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	2.80
		Max	0.68	1.62	0.012	0.14	1.172	12	0.05	1.19	0.07	< 0.01	0.4	0.5	< 0.005	16.89
Lobster	5	Mean	3.71	5.05	0.066	0.13	17.666	7	0.11	1.71	0.14	0.02	0.5	< 0.1	< 0.005	22.50
		Min	0.46	0.10	0.006	< 0.05	1.600	2	< 0.02	0.74	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	4.00
		Max	12.00	12.58	0.130	0.19	46.091	12	0.25	2.64	0.48	0.04	1.1	< 0.1	< 0.005	43.79
Mackerel	7	Mean	0.48	1.86	0.006	0.11	0.798	11	0.05	0.25	< 0.05	< 0.01	0.3	< 0.1	< 0.005	7.21
		Min	< 0.25	0.85	< 0.005	0.06	0.530	7	< 0.02	0.06	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	3.83
		Max	1.11	2.60	0.007	0.20	1.100	14	0.08	0.69	< 0.05	0.03	0.4	< 0.1	< 0.005	9.60

Type of fish	Number of samples		Average concentration of element (mg/kg)													
			Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Tl	Zn
Molluscs ¹	33	Mean	28.03	4.00	0.236	0.23	6.915	70	0.03	4.11	0.57	0.23	0.5	< 0.1	< 0.005	28.89
		Min	0.26	0.14	0.017	< 0.05	0.190	3	< 0.02	0.15	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	6.70
		Max	180.00	22.00	0.781	0.90	42.343	410	0.08	15.00	4.70	1.17	1.5	0.5	< 0.005	190.00
Prawns	24	Mean	1.95	4.94	0.029	0.11	3.415	4	0.03	0.42	0.06	0.02	0.3	< 0.1	< 0.005	10.52
		Min	< 0.25	0.24	< 0.005	< 0.05	0.680	< 1	< 0.02	0.11	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	2.20
		Max	14.24	16.73	0.240	0.40	12.371	21	0.07	1.87	0.18	0.05	0.6	0.6	< 0.005	30.01
Roe ²	7	Mean	0.49	0.43	0.006	0.11	0.574	7	< 0.02	0.70	< 0.05	< 0.01	0.6	< 0.1	< 0.005	18.53
		Min	< 0.25	0.13	< 0.005	< 0.05	0.215	3	< 0.02	0.21	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	5.64
		Max	0.83	0.70	0.010	0.19	0.977	11	0.03	2.46	< 0.05	0.02	1.1	0.3	< 0.005	44.46
Salmon	21	Mean	1.66	0.68	0.006	0.12	0.538	32	0.03	0.73	< 0.05	< 0.01	0.3	< 0.1	< 0.005	5.24
		Min	< 0.25	0.06	< 0.005	< 0.05	0.226	3	< 0.02	0.08	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	1.62
		Max	12.61	1.75	0.010	0.27	0.850	323	0.05	1.80	0.14	0.03	0.4	0.5	< 0.005	9.18
Sardines and pilchards	5	Mean	2.57	1.20	0.049	0.12	1.191	24	< 0.02	1.63	0.06	0.02	0.3	0.2	0.008	12.36
		Min	0.45	0.81	0.017	< 0.05	0.909	12	< 0.02	1.36	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	7.53
		Max	6.83	1.82	0.100	0.30	1.565	30	< 0.02	2.07	0.11	0.05	0.4	0.3	0.015	18.78
Tuna	12	Mean	0.72	0.91	0.030	0.08	0.630	11	0.11	0.43	< 0.05	< 0.01	0.67	0.14	< 0.005	5.29
		Min	< 0.25	0.22	0.009	< 0.05	0.368	5	< 0.02	0.06	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	2.44
		Max	2.40	1.67	0.111	0.28	0.874	24	0.44	1.43	< 0.05	0.03	0.9	0.5	< 0.005	7.88
Miscellaneous ³	22	Mean	1.67	1.01	0.010	0.11	0.370	5	0.05	0.71	< 0.05	0.02	0.27	< 0.1	< 0.005	5.73
		Min	< 0.25	< 0.05	< 0.005	< 0.05	0.134	2	< 0.02	0.08	< 0.05	< 0.01	< 0.2	< 0.1	< 0.005	< 0.20
		Max	6.57	4.60	0.024	0.30	0.635	22	0.27	2.29	< 0.05	0.12	0.9	0.2	< 0.005	38.38

1. Includes oysters, mussels, cephalopods, winkles, cockles and whelks (gastropods).

2. Includes herring, cod and lumpfish

3. Includes gelite fish, sild, catfish, whiting, eels, blanchbait, Arbroath smokies, halibut, swordfish and unspecified fish.

All values are upper bound measures: results below the limits of quantitation have been replaced with the relevant limit of quantitation.

Table 3 Estimated maximum daily high-level intakes of heavy metals and other elements from processed fish and shellfish

Contaminant	Food	Concentration in food (mg/kg)	Portion size (g)	Safety guideline [11–20] (µg/kg bw/week)	Estimated intake* (µg/kg bw)	Contribution to PTWI (%)
Aluminium	Cockles	180.00	30	7000	77.0	1.1
Arsenic	Crab claws	30.84	70	14.98	1.54 [†]	10.3 [†]
Cadmium	Crab	3.701	70	7	3.7	52.8
Cadmium	Crab spread	3.078	30	7	1.3	18.8
Cadmium	Tuna	0.111	70	7	0.1	1.6
Chromium	Winkles	0.90	30	1050	0.4	<0.1
Copper	Lobster	46.091	70	1120	46.0	4.1
Iron	Cockles	410	30	5600	175.5	3.1
Lead	Winkles	1.17	30	25.2	0.5	2.0
Manganese	Winkles	15.00	30	n/a	6.4	n/a
Mercury	Tuna	0.44	70	1.61	0.4	27.3
Mercury	Swordfish	0.27	140	1.61	0.5	33.5
Nickel	Cockles	4.70	30	35	2.0	5.7
Selenium	Crab Claws	1.7	70	35	1.7	4.9
Thallium	Pilchards	0.015	70	n/a	0.0	n/a
Tin	Prawn Spring Rolls	0.6	30	1540	0.3	< 0.1
Zinc	Smoked Oysters	190.00	70	4900	189.7	3.9

The estimated intake of each element is shown for the product with the highest level of that element. For cadmium and mercury, several examples are given to highlight the different estimated intakes for these metals.

* The estimated intake is based on consumption by a 70.1 kg adult.

[†] This value has been adjusted so as to be representative of inorganic arsenic. Total arsenic was measured in this survey. Results from a previous survey ^[7] indicate that approximately 5 % of the total arsenic found in fish is inorganic arsenic.

Annex 1 Processed fish and shellfish samples collected — ordered by sample code

Sample Code	Product described as	Brand	Date of purchase	Name of retail outlet	Outlet type	Outlet address
11535	Scottish 50/50 Crab Meat	None declared	01.06.05	Alan Beveridge	Specialist retailer	144 Fenwick Road, Glasgow, G46 6TW
11536	Cantonese 6 Prawn Spring Rolls	Sainsbury's	10.05.05	Sainsbury's	Supermarket	Unit 14a, Forestside Shopping Centre, Upper Galwally, Belfast, BT8 6FX
11537	Sardines in Tomato Sauce	Epicure	22.06.05	Sawers	Specialist retailer	Unit 7, Fountain Centre, Belfast, BT1 6ES
11538	2 Salmon Fishcakes	Sainsbury's	10.05.05	Sainsbury's	Supermarket	Unit 14a, Forestside Shopping Centre, Upper Galwally, Belfast, BT8 6FX
11539	Octopus Salad	Sawers	22.06.05	Sawers	Specialist retailer	Unit 7, Fountain Centre, Belfast, BT1 6ES
11540	Cooked Irish Mussels in Mediterranean Sauce	Carrokeel	10.05.05	Sainsbury's	Supermarket	Unit 14a, Forestside Shopping Centre, Upper Galwally, Belfast, BT8 6FX
11541	Crab Sticks	None declared	22.06.05	Sawers	Specialist retailer	Unit 7, Fountain Centre, Belfast, BT1 6ES
11542	16 Seafood Sticks	Sainsbury's	10.05.05	Sainsbury's	Supermarket	Unit 14a, Forestside Shopping Centre, Upper Galwally, Belfast, BT8 6FX
11543	Catfish	None declared	11.06.05	Wumak Food Store	Smaller retailer	278 Barking Road, Plaistow, E13 8HR
11544	Cooked Winkles	None declared	22.06.05	Atlantic Fish	Specialist retailer	5 Atlantic Avenue, Belfast, BT15 2HN
11545	Prawn Cocktail	Sainsbury's Be Good to Yourself	10.05.05	Sainsbury's	Supermarket	Unit 14a, Forestside Shopping Centre, Upper Galwally, Belfast, BT8 6FX
11546	Wild Red Salmon	John West	10.05.05	Sainsbury's	Supermarket	Unit 14a, Forestside Shopping Centre, Upper Galwally, Belfast, BT8 6FX
11547	Prawns in Chilli Sauce	None declared	22.06.05	Atlantic Fish	Specialist retailer	5 Atlantic Avenue, Belfast, BT15 2HN
11548	Fresh Swordfish Steaks with a Red Pepper Marinade (on display)	Waitrose	24.06.05	Waitrose	Supermarket	92 – 96 High Road, South Woodford, London, E18 2NA
11549	Skinless & Boneless Saltfish Fillets	Sunshine Saltfish Ltd	24.06.05	Golbourne Fisheries	Specialist retailer	77 Goldbourne Road, London, W10 5NP
11550	Tuna Steaks in Brine	Glenryck	18.06.05	Asda	Supermarket	10 Pencarn Way, Coedkernew, Newport, NP10 8XL
11551	Cooked Crayfish	None declared	18.06.05	Birds Fish	Specialist retailer	4 Merthyr Road, Whitchurch, Cardiff, CF14 1DG
11552	Cooked Whelks	None declared	18.06.05	Birds Fish	Specialist retailer	4 Merthyr Road, Whitchurch, Cardiff, CF14 1DG
11553	Green Lipped Mussels - Cooked	None declared	24.06.05	Golbourne Fisheries	Specialist retailer	77 Goldbourne Road, London, W10 5NP
11554	Cooked Cockles	None declared	18.06.05	Birds Fish	Specialist retailer	4 Merthyr Road, Whitchurch, Cardiff, CF14 1DG
11555	Tuna in a Red Chilli and Lime Dressing	Princes Slimming World	18.06.05	Somerfield	Supermarket	34 – 40 Merthyr Road, Whitchurch, Cardiff, CF14 1DH

Sample Code	Product described as	Brand	Date of purchase	Name of retail outlet	Outlet type	Outlet address
11556	Tiger Prawns	Somerfield	18.06.05	Somerfield	Supermarket	34 – 40 Merthyr Road, Whitchurch, Cardiff, CF14 1DH
11557	Herring Roe	None declared	18.06.05	Birds Fish	Specialist retailer	4 Merthyr Road, Whitchurch, Cardiff, CF14 1DG
11558	Cooked Crevettes	None declared	18.06.05	Birds Fish	Specialist retailer	4 Merthyr Road, Whitchurch, Cardiff, CF14 1DG
11559	Dressed Crab	None declared	24.06.05	Golbourne Fisheries	Specialist retailer	77 Goldbourne Road, London, W10 5NP
11560	Medium Prawns	Somerfield	18.06.05	Somerfield	Supermarket	34 – 40 Merthyr Road, Whitchurch, Cardiff, CF14 1DH
11561	Cooked Mussels	None declared	18.06.05	K Ashton	Specialist retailer	Central Market, Cardiff, CF1 2AV
11562	Crab Sticks	None declared	18.06.05	K Ashton	Specialist retailer	Central Market, Cardiff, CF1 2AV
11563	Seafood Cocktail	None declared	18.06.05	K Ashton	Specialist retailer	Central Market, Cardiff, CF1 2AV
11564	Tuna in Tomato & Herb Dressing	Weight Watchers from Heinz	22.06.05	Centra Quickstop	Smaller retailer	8 – 9 Ferguson House, Wellington Place, Belfast, BT1 6GF
11565	Squat Lobster	Young's	04.06.05	Iceland	Supermarket	126 High Street, Barnet, EN5 5XQ
11566	Smoked Scottish Haddock Fillets with Butter	Young's	04.06.05	Iceland	Supermarket	126 High Street, Barnet, EN5 5XQ
11567	Cooked & Peeled North Atlantic Prawns	Iceland	04.06.05	Iceland	Supermarket	126 High Street, Barnet, EN5 5XQ
11568	Unsweet Fried Fish Balls	Hoffmans	04.06.05	Cockfosters Delicatessen	Specialist retailer	19 Station Parade, Cockfosters Road, EN4 0DL
11569	Smoked Cod Roe (verbal)	None declared	04.06.05	Cockfosters Delicatessen	Specialist retailer	19 Station Parade, Cockfosters Road, EN4 0DL
11570	Salmon Pate	Mr. Freed's appetisers	04.06.05	Waitrose	Supermarket	16 The Spires, 111 High Street, Barnett, EN5 5XY
11571	Traditional Bismarck Herrings	Mrs Elswood	04.06.05	Waitrose	Supermarket	16 The Spires, 111 High Street, Barnett, EN5 5XY
11572	Bismarck Herrings	Simons	04.06.05	Waitrose	Supermarket	16 The Spires, 111 High Street, Barnett, EN5 5XY
11573	Gefilte fish	Manischewitz	04.06.05	Waitrose	Supermarket	16 The Spires, 111 High Street, Barnett, EN5 5XY
11574	Fish Soup	Perard du Touquet	04.06.05	Waitrose	Supermarket	16 The Spires, 111 High Street, Barnett, EN5 5XY
11575	Salmon Batons	Great Food	04.06.05	Waitrose	Supermarket	116 The Spires, 111 High Street, Barnett, EN5 5XY
11576	Organic Salmon	Kinvara	04.06.05	Waitrose	Supermarket	16 The Spires, 111 High Street, Barnett, EN5 5XY
11577	Octopus Chunks in Olive Oil	Palacio de Oriente	04.06.05	Waitrose	Supermarket	16 The Spires, 111 High Street, Barnett, EN5 5XY

Sample Code	Product described as	Brand	Date of purchase	Name of retail outlet	Outlet type	Outlet address
11578	Scallops in Seafood Sauce with Olive Oil	Palacio de Oriente	04.06.05	Waitrose	Supermarket	16 The Spires, 111 High Street, Barnett, EN5 5XY
11579	16 Seafood Sticks	Tesco	04.06.05	Tesco Express	Supermarket	186 East Barnet Road, Barnet EN4 8QX
11580	Sardines in Brine	Tesco	04.06.05	Tesco Express	Supermarket	186 East Barnet Road, Barnet EN4 8QX
11581	Crab Meat - All White	Torbay	04.06.05	Poisson	Specialist retailer	7 Station Parade, Cockfosters Road, Barnet, EN4 0DL
11582	Blanchbait	Paramount	04.06.05	Poisson	Specialist retailer	7 Station Parade, Cockfosters Road, Barnet, EN4 0DL
11583	Cooked Frozen Whelks	Tuskar Rock Seafood	04.06.05	Poisson	Specialist retailer	7 Station Parade, Cockfosters Road, Barnet, EN4 0DL
11584	Portuguese Sardine Pate	Fides	04.06.05	Poisson	Specialist retailer	7 Station Parade, Cockfosters Road, Barnet, EN4 0DL
11585	Whole Cooked Spanish Octopus Vulgaris	None declared	04.06.05	Poisson	Specialist retailer	7 Station Parade, Cockfosters Road, Barnet, EN4 0DL
11586	Pure Dressed Crab	Spiveys	04.06.05	Poisson	Specialist retailer	7 Station Parade, Cockfosters Road, Barnet, EN4 0DL
11587	Cooked Chilean Mussel Meat - 1QF Ice Glazed	None declared	04.06.05	Poisson	Specialist retailer	7 Station Parade, Cockfosters Road, Barnet, EN4 0DL
11588	Seafood Cocktail	Waitrose	04.06.05	Waitrose	Supermarket	16 The Spires, 111 High Street, Barnett, EN5 5XY
11589	Smoked Oysters in Cottonseed Oil	Epicure	04.06.05	Waitrose	Supermarket	16 The Spires, 111 High Street, Barnett, EN5 5XY
11590	Smoked mackerel (display label)	None declared	09.04.05	Mayers Fishmongers	Specialist retailer	Stalls 10 – 12, Blackburn Fish Market, BB1 6AS
11591	Fresh Golden Cutlets - Whiting, cold smoked (display label)	None declared	09.04.05	Mayers Fishmongers	Specialist retailer	Stalls 10 – 12, Blackburn Fish Market, BB1 6AS
11592	Traditional Mussels off the Shell Cooked - Ready to Eat (display label)	Sea Katch (display label)	09.04.05	Mayers Fishmongers	Specialist retailer	Stalls 10 – 12, Blackburn Fish Market, BB1 6AS
11593	New Zealand Greenshell Mussels IQF Mussel Meat	Six Fathoms	09.04.05	Mayers Fishmongers	Specialist retailer	Stalls 10 – 12, Blackburn Fish Market, BB1 6AS
11594	Large Luxury Prawns	Royal Greenland	09.04.05	Mayers Fishmongers	Specialist retailer	Stalls 10 – 12, Blackburn Fish Market, BB1 6AS
11595	Smoked Mackerel Pate	Bleiker's	10.04.05	Booths Supermarkets	Smaller retailer	Millbrook Way, Penwortham, Preston, PR1 0XW
11596	10 Fish Fingers 100% Cod Fillet	Birds Eye	10.04.05	Hunt's Spar Shop	Smaller retailer	11 – 15 Broadfield Drive, Leyland, Lancashire, PR5 1GJ

Sample Code	Product described as	Brand	Date of purchase	Name of retail outlet	Outlet type	Outlet address
11597	South Atlantic Pilchards in Tomato Sauce	Glenryck	10.04.05	Booths Supermarkets	Smaller retailer	Millbrook Way, Penwortham, Preston, PR1 0XW
11598	Wild Red Salmon	Princes	10.04.05	Booths Supermarkets	Smaller retailer	Millbrook Way, Penwortham, Preston, PR1 0XW
11599	Cooked Whole Prawns in Shell	Asda	11.04.05	Asda Stores Ltd	Supermarket	Lower Audley Retail Park, Grimshaw Park Road, Blackburn, BB2 3DY
11600	Cooked King Prawns	Asda Extra Special	11.04.05	Asda Stores Ltd	Supermarket	Lower Audley Retail Park, Grimshaw Park Road, Blackburn, BB2 3DY
11601	20 Seafood Sticks with 2 Flavoured Dips	Asda	11.04.05	Asda Stores Ltd	Supermarket	Lower Audley Retail Park, Grimshaw Park Road, Blackburn, BB2 3DY
11602	Scallops with Roasted Garlic Butter	Tesco Finest	11.04.05	Tesco	Supermarket	Hill Street, Blackburn, BB1 3HF
11603	Crab Paste	Asda	11.04.05	Asda Stores Ltd	Supermarket	Lower Audley Retail Park, Grimshaw Park Road, Blackburn, BB2 3DY
11604	Pink Salmon	Chicken of the Sea	11.04.05	Tesco	Supermarket	Hill Street, Blackburn, BB1 3HF
11605	Tuna Chunks in Brine	Tesco	11.04.05	Tesco	Supermarket	Hill Street, Blackburn, BB1 3HF
11606	Lumpfish Caviar	Ora Kaviar	10.04.05	Provender Delicatessen	Specialist retailer	www.provender.co.uk/sales@provender.co.uk, (3 Market Square, South Petherton, Somerset,
11607	Pressed Cod Roe	Princes	13.04.05	Tesco	Supermarket	Towngate, Leyland, PR25 2FN
11608	Tuna Chunks in Sunflower Oil	Sainsbury's	13.04.05	Sainsbury's	Supermarket	Cuerden Way, Bamber Bridge, Preston, PR5 6BJ
11609	Lobster Cooked & Dressed	Croft Quality Seafoods	12.04.05	Island Seafare Ltd	Specialist retailer	www.islandseafare.co.uk/enquiries@islandseafare.co.uk (Alfred Pier, Port St. Mary, Isle of Man, IM9
11610	Marinated Whelks	None declared	09.06.05	Eden Fisheries	Specialist retailer	1a Winchester Street, South Shields, NE33 2PS
11611	North Atlantic Prawns	Tahay	09.06.05	Heron Frozen Foods	Smaller retailer	10 The Interchange, Gateshead, Tyne & Wear, NE8 1BH
11612	Cooked Mussels	Frescot	09.06.05	Heron Frozen Foods	Smaller retailer	10 The Interchange, Gateshead, Tyne & Wear, NE8 1BH
11613	North Atlantic Prawns	Co-op	09.06.05	Co-op	Supermarket	Jackson Street, Gateshead, Tyne & Wear, NE8 1HR
11614	Mackerel Fillets in Brine	Co-op	09.06.05	Co-op	Supermarket	Jackson Street, Gateshead, Tyne & Wear, NE8 1HR
11615	Red Salmon	Ensign	09.06.05	Kwik Save	Smaller retailer	239-241 High Street, Gateshead, Tyne & Wear, NE8 1EP
11616	Red Salmon	Cucumber	09.06.05	Home Bargains	Smaller retailer	227 High Street, Gateshead, Tyne & Wear, NE8 1AS
11617	Tuna Flakes in Brine	Osprey	09.06.05	Kwik Save	Smaller retailer	239-241 High Street, Gateshead, Tyne & Wear, NE8 1EP
11618	Tuna Chunks in Brine	Puffin	09.06.05	Co-op	Supermarket	Jackson Street, Gateshead, Tyne & Wear, NE8 1HR

Sample Code	Product described as	Brand	Date of purchase	Name of retail outlet	Outlet type	Outlet address
11619	Sockeye Wild Pacific Red Salmon	Co-op	09.06.05	Co-op	Supermarket	Jackson Street, Gateshead, Tyne & Wear, NE8 1HR
11620	Tuna Pate	Tesco	09.06.05	Tesco Extra	Supermarket	Kingston Park Centre, Newcastle, Tyne & Wear, NE3 2FP
11621	Cockles	Van Smirren Seafoods	09.06.05	Tesco Extra	Supermarket	Kingston Park Centre, Newcastle, Tyne & Wear, NE3 2FP
11622	Anchovy Paste	GIA	09.06.05	Tesco Extra	Supermarket	Kingston Park Centre, Newcastle, Tyne & Wear, NE3 2FP
11623	Herring Fillets in Tomato Sauce	Norge	09.06.05	Netto	Smaller retailer	Kings Court, Kingston Park Centre, New Castle, NE3 5NA
11624	Pink Salmon - Wild Pacific	Ocean Fresh	09.06.05	Netto	Smaller retailer	Kings Court, Kingston Park Centre, New Castle, NE3 5NA
11625	Cooked Lobster	None declared	09.06.05	Eden Fisheries	Specialist retailer	1a Winchester Street, South Shields, NE33 2PS
11626	Shrimps in Brine	John West	09.06.05	Tesco Extra	Supermarket	Kingston Park Centre, Newcastle, Tyne & Wear, NE3 2FP
11627	Sild in Sunflower Oil	John West	09.06.05	Tesco Extra	Supermarket	Kingston Park Centre, Newcastle, Tyne & Wear, NE3 2FP
11628	Large King Prawns	Tesco	09.06.05	Tesco Extra	Supermarket	Kingston Park Centre, Newcastle, Tyne & Wear, NE3 2FP
11629	Large Prawns	Young's	09.06.05	Tesco Extra	Supermarket	Kingston Park Centre, Newcastle, Tyne & Wear, NE3 2FP
11630	Salmon Fillet in Lemon & Dill Crumb (On display)	Dents of Hilgay (On display)	21.05.05	Dents of Hilgay Farm Shop and Fishery	Smaller retailer	Steels Drove, West Fen, Hilgay, PE38 0QH
11631	Tuna Chunks in Brine	Princes	21.05.05	West Winch Village Stores	Smaller retailer	212 Main Road, West Winch, King's Lynn, PE33 0NP
11632	Dressed Cromer Crab	None declared	21.05.05	DC Atkinson (Licensed Market Stall)	Specialist retailer	Saturday Market Place, King's Lynn
11633	Cooked Winkles	None declared	21.05.05	DC Atkinson (Licensed Market Stall)	Specialist retailer	Saturday Market Place, King's Lynn
11634	Cooked Brown Shrimp	None declared	21.05.05	DC Atkinson (Licensed Market Stall)	Specialist retailer	Saturday Market Place, King's Lynn
11635	White Crabmeat Chunks in Brine	Marks and Spencer	21.05.05	Marks and Spencer	Supermarket	57 High Street, King's Lynn, PE30 1AY
11636	16 Seafood Sticks	Young's	21.05.05	Costcutter	Smaller retailer	169 Saddlebow Road, South Lynn, PE30 5BN
11637	Smoked Haddock Fillets	Marks and Spencer	21.05.05	Marks and Spencer	Supermarket	57 High Street, King's Lynn, PE30 1AY
11638	Poached Salmon & Cucumber	Marks and Spencer	21.05.05	Marks and Spencer	Supermarket	57 High Street, King's Lynn, PE30 1AY
11639	King Prawns	La Caldera	21.05.05	Lidl	Smaller retailer	88 Austing Street, King's Lynn, PE30 1AS
11640	Herring Fillets in Brine and Own Juices	Petri	21.05.05	Lidl	Smaller retailer	88 Austing Street, King's Lynn, PE30 1AS

Sample Code	Product described as	Brand	Date of purchase	Name of retail outlet	Outlet type	Outlet address
11641	French Fish Soup with Muscadet	Select Maree	21.05.05	Morrisons	Supermarket	Coburg Street, King's Lynn, PE30 1QB
11642	Salmon Paste	Princes	21.05.05	Morrisons	Supermarket	Coburg Street, King's Lynn, PE30 1QB
11643	Smoked Salmon Pate	Epicure	21.05.05	Morrisons	Supermarket	Coburg Street, King's Lynn, PE30 1QB
11644	Anchovy Paste	Shippam's	21.05.05	Morrisons	Supermarket	Coburg Street, King's Lynn, PE30 1QB
11645	Pickled Mussels	Parsons	21.05.05	Morrisons	Supermarket	Coburg Street, King's Lynn, PE30 1QB
11646	Pickled Cockles	Parsons	21.05.05	Morrisons	Supermarket	Coburg Street, King's Lynn, PE30 1QB
11647	Smoked Salmon Trimmings	Tesco Value	21.05.05	Tesco	Supermarket	St. Faith's Drive, Gaywood, King's Lynn, PE30 4PU
11648	Jellied Eels	Tesco	21.05.05	Tesco	Supermarket	St. Faith's Drive, Gaywood, King's Lynn, PE30 4PU
11649	Soft Cod Roes	John West	21.05.05	Tesco	Supermarket	St. Faith's Drive, Gaywood, King's Lynn, PE30 4PU
11650	Crab Spread	Shippam's	30.04.05	Tesco Extra	Supermarket	Riverway Retail Park, Ayr Road, Irvine, KA12 8DF
11651	North Atlantic Prawns	Lyons Raider	01.06.05	Alan Beveridge	Specialist retailer	144 Fenwick Road, Glasgow, G46 6XW
11652	Wild Pacific Pink Salmon	Asda	28.04.05	Asda	Supermarket	Queen's Drive, Kilmarnock, KA1 3XF
11653	Kippers	None declared	01.06.05	Alan Beveridge	Specialist retailer	144 Fenwick Road, Glasgow, G46 6XW
11654	Smoked Mackerel	None declared	01.06.05	Alan Beveridge	Specialist retailer	144 Fenwick Road, Glasgow, G46 6XW
11655	Salmon Paste	Sainsbury's	30.04.05	Sainsbury's	Supermarket	Braehead Centre, King's Inch Road, Glasgow, G51 4BP
11656	Lumpfish Caviar	Spinnaker	30.04.05	Sainsbury's	Supermarket	Braehead Centre, King's Inch Road, Glasgow, G51 4BP
11657	Tuna & Mayonnaise Paste	Sainsbury's	30.04.05	Sainsbury's	Supermarket	Braehead Centre, King's Inch Road, Glasgow, G51 4BP
11658	Seafood Cocktail	Morrison's	29.04.05	Morrisons	Supermarket	West Langlands Street, Kilmarnock, KA1 2PY
11659	Lemon & Parsley Smoked Mackerel Fillets	None declared	29.04.05	Morrisons	Supermarket	West Langlands Street, Kilmarnock, KA1 2PY
11660	Large Cooked & Peeled Prawns	Tesco Finest	30.04.05	Tesco Extra	Supermarket	Riverway Retail Park, Ayr Road, Irvine, KA12 8DF
11661	Findon Haddock	None declared	01.06.05	Alan Beveridge	Specialist retailer	144 Fenwick Road, Glasgow, G46 6XW
11662	Seafood Selection	Tesco	30.04.05	Tesco Extra	Supermarket	Riverway Retail Park, Ayr Road, Irvine, KA12 8DF

Sample Code	Product described as	Brand	Date of purchase	Name of retail outlet	Outlet type	Outlet address
11663	Hot Smoked Trout Fillets	St James Smokehouse (Scotland) Ltd	01.06.05	Alan Beveridge	Specialist retailer	144 Fenwick Road, Glasgow, G46 6XW
11664	Prawn Cocktail	Morrison's	29.04.05	Morrisons	Supermarket	West Langlands Street, Kilmarnock, KA1 2PY
11665	Arbroath Smokies	Tesco	30.04.05	Tesco Extra	Supermarket	Riverway Retail Park, Ayr Road, Irvine, KA12 8DF
11666	Smoked Mackerel Ready to Eat - Peppered	Morrison's	29.04.05	Morrisons	Supermarket	West Langlands Street, Kilmarnock, KA1 2PY
11667	Scottish Caught Skinless Smoked Haddock Block	Tesco	30.04.05	Tesco Extra	Supermarket	Riverway Retail Park, Ayr Road, Irvine, KA12 8DF
11668	Smoked Halibut	Royal Greenland	01.06.05	Alan Beveridge	Specialist retailer	144 Fenwick Road, Glasgow, G46 6XW
11669	Kipper Fillets	Morrison's	29.04.05	Morrisons	Supermarket	West Langlands Street, Kilmarnock, KA1 2PY
11670	Rollmops	None declared	01.06.05	Alan Beveridge	Specialist retailer	144 Fenwick Road, Glasgow, G46 6XW
11671	King Prawns	Lyons Seafoods	29.04.05	Morrisons	Supermarket	West Langlands Street, Kilmarnock, KA1 2PY
11672	20 Seafood Sticks	Asda	28.04.05	Asda	Supermarket	Queen's Drive, Kilmarnock, KA1 3XF
11673	Mussels Cooked and Shelled	Asda	28.04.05	Asda	Supermarket	Queen's Drive, Kilmarnock, KA1 3XF
11674	4 Cod Fishcakes	Asda	28.04.05	Asda	Supermarket	Queen's Drive, Kilmarnock, KA1 3XF
11675	4 Breaded White Fish Portions	Asda Smartprice	28.04.05	Asda	Supermarket	Queen's Drive, Kilmarnock, KA1 3XF
11676	Scottish Cooked & Peeled Cold Water Prawns	Moray	28.04.05	Asda	Supermarket	Queen's Drive, Kilmarnock, KA1 3XF
11677	Cooked Crabs Claws	None declared	09.06.05	Eden Fisheries	Specialist retailer	1a Winchester Street, South Shields, NE33 2PS
11678	Smoked Scottish Mackerel Strips	Asda	28.04.05	Asda	Supermarket	Queen's Drive, Kilmarnock, KA1 3XF
11679	Cooked Winkles	None declared	09.06.05	Eden Fisheries	Specialist retailer	1a Winchester Street, South Shields, NE33 2PS
11680	Crevettes Grises Entieres (shrimps at time of purchase)	Heiploeg	21.04.05	Ringwood Fisheries	Specialist retailer	36 High Street, Ringwood, Hampshire, BH25 1AD
11681	Bigorneaux (cooked winkles at time of)	Donegal	20.04.05	Ringwood Fisheries	Specialist retailer	36 High Street, Ringwood, Hampshire, BH25 1AD
11682	Mussels in a Garlic Butter Sauce	Murphy's Irish Seafood	20.04.05	Safeway	Supermarket	Pedlars Walk, Ringwood, Hampshire, BH24 1AY
11683	Cooked Shelled Cockles	None declared	20.04.05	Ringwood Fisheries	Specialist retailer	36 High Street, Ringwood, Hampshire, BH25 1AD

Sample Code	Product described as	Brand	Date of purchase	Name of retail outlet	Outlet type	Outlet address
11684	Sandwich Filling Seafood Cocktail	Morrison's	20.04.05	Safeway	Supermarket	Pedlars Walk, Ringwood, Hampshire, BH24 1AY
11685	Ocean Stix	Macrae Seafoods	20.04.05	Ringwood Fisheries	Specialist retailer	36 High Street, Ringwood, Hampshire, BH25 1AD
11686	Salmon Paste	Morrison's	20.04.05	Safeway	Supermarket	Pedlars Walk, Ringwood, Hampshire, BH24 1AY
11687	Tuna in Olive Oil with Lemon & Herbs	Morrison's	20.04.05	Safeway	Supermarket	Pedlars Walk, Ringwood, Hampshire, BH24 1AY
11688	Sardines in Brine	Morrison's	20.04.05	Safeway	Supermarket	Pedlars Walk, Ringwood, Hampshire, BH24 1AY
11689	Salmon Paste	Tesco Value	21.05.05	Tesco	Supermarket	St. Faith's Drive, Gaywood, King's Lynn, PE30 4PU
11690	Scampi Bites	Ross	20.04.05	Safeway	Supermarket	Pedlars Walk, Ringwood, Hampshire, BH24 1AY
11691	Fish Cakes (at time of purchase)	Norvik Foods (at time of purchase)	21.04.05	Ringwood Fisheries	Specialist retailer	36 High Street, Ringwood, Hampshire, BH25 1AD
11692	Undyed Smoked Haddock (at time of purchase)	None declared	20.04.05	Ringwood Fisheries	Specialist retailer	36 High Street, Ringwood, Hampshire, BH25 1AD
11693	Smoked Scottish Salmon	Morrison's	20.04.05	Safeway	Supermarket	Pedlars Walk, Ringwood, Hampshire, BH24 1AY
11694	Smoked Cooked Cod Roe (at time of purchase)	None declared	20.04.05	Ringwood Fisheries	Specialist retailer	36 High Street, Ringwood, Hampshire, BH25 1AD
11695	Luxury Orkney Crab Pate	Castle MacLellan	21.04.05	Bookers	Smaller retailer	Yeomans Industrial Park, Bournemouth, BH8 0BJ
11696	Tuna Flakes in Brine	Chef's Larder	21.04.05	Bookers	Smaller retailer	Yeomans Industrial Park, Bournemouth, BH8 0BJ
11697	Crispy Calamari	Lyons Seafoods	21.04.05	Bookers	Smaller retailer	Yeomans Industrial Park, Bournemouth, BH8 0BJ
11698	Cooked Crevette	Booker	21.04.05	Bookers	Smaller retailer	Yeomans Industrial Park, Bournemouth, BH8 0BJ
11699	Spicy Mussels	Sawers	22.06.05	Sawers	Specialist retailer	Unit 7, Fountain Centre, Belfast, BT1 6ES

Annex 2 Results for individual samples of processed fish and fish products — ordered by type of fish

Type	Sample number	Product description	Concentration of metal (mg/kg)													
			Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Tl	Zn
Anchovy	11622	Anchovy Paste	4.02	1.24	0.017	0.55	1.078	33	0.08	6.14	0.05	0.15	0.6	0.1	0.005	21.09
	11644	Anchovy Paste	4.18	0.72	0.029	0.29	1.891	22	0.03	3.94	0.10	0.03	0.4	0.2	0.005	13.69
Cod	11596	10 Fish Fingers 100% Cod Fillet	0.60	3.60	0.005	0.13	0.540	6	0.03	1.40	0.05	0.01	0.2	0.1	0.005	3.40
	11674	4 Cod Fishcakes	0.92	1.80	0.010	0.21	0.640	6	0.03	1.60	0.09	0.01	0.2	0.1	0.005	3.00
	11549	Skinless & Boneless Salfish Fillets	2.93	0.78	0.006	0.34	0.493	8	0.03	1.43	0.09	0.13	0.5	0.1	0.005	8.61
Crab	11635	White Crabmeat Chunks in Brine	1.79	1.58	0.232	0.05	3.893	4	0.08	1.05	0.05	0.01	0.4	0.1	0.005	13.43
	11535	Scottish 50/50 Crab Meat	1.86	7.45	3.701	0.11	12.479	20	0.07	1.98	0.05	0.02	1.0	0.1	0.005	72.00
	11559	Dressed Crab	1.10	7.75	0.805	0.08	30.000	13	0.09	3.64	0.05	0.07	0.8	0.1	0.005	53.00
	11581	Crab Meat - All White	4.03	10.40	0.312	0.07	9.229	10	0.13	0.95	0.05	0.04	0.5	0.1	0.005	66.55
	11586	Pure Dressed Crab	1.82	5.14	1.328	0.09	33.524	19	0.08	6.27	0.05	0.08	0.9	0.1	0.005	40.76
	11632	Dressed Cromer Crab	0.82	5.55	0.219	0.05	33.044	16	0.07	3.98	0.05	0.06	1.1	0.1	0.005	42.15
	11677	Cooked Crabs Claws	0.77	30.84	0.017	0.20	28.427	6	0.08	2.05	0.05	0.06	1.7	0.1	0.005	175.35
	11541	Crab Sticks	2.98	0.08	0.007	0.12	0.287	5	0.03	0.37	0.05	0.04	0.2	0.1	0.005	2.52
	11562	Crab Sticks	4.43	0.16	0.005	0.09	0.219	4	0.02	0.18	0.05	0.01	0.2	0.1	0.005	2.03
	11603	Crab Paste	0.78	2.30	0.390	0.12	2.900	94	0.05	1.20	0.09	0.04	0.4	0.1	0.005	12.00
	11650	Crab Spread	1.68	9.28	3.078	0.11	18.708	23	0.03	2.52	0.11	0.03	0.9	0.1	0.005	41.96
11695	Luxury Orkney Crab Pate	0.75	4.20	2.700	0.09	6.300	11	0.04	1.30	0.05	0.01	0.6	0.1	0.005	23.00	
Haddock	11566	Smoked Scottish Haddock Fillets with Butter	0.36	2.89	0.005	0.10	0.215	3	0.06	0.25	0.05	0.01	0.2	0.1	0.005	2.39
	11637	Smoked Haddock Fillets	0.25	4.51	0.005	0.14	0.108	1	0.03	0.09	0.05	0.02	0.2	0.1	0.005	0.47
	11661	Findon Haddock	0.25	3.84	0.005	0.18	0.282	2	0.07	0.07	0.14	0.01	0.3	0.1	0.005	1.34
	11667	Scottish Caught Skinless Smoked Haddock Block	0.25	3.10	0.005	0.05	0.180	2	0.08	0.09	0.05	0.01	0.2	0.1	0.005	3.40
	11692	Undyed Smoked Haddock (at time of purchase)	0.25	5.40	0.005	0.18	0.200	2	0.06	0.15	0.09	0.01	0.3	0.1	0.005	3.50
Herring	11571	Traditional Bismarck Herrings	0.31	0.71	0.005	0.10	0.832	5	0.02	0.21	0.05	0.01	0.2	0.1	0.005	3.16
	11572	Bismarck Herrings	0.38	0.97	0.005	0.14	0.891	8	0.02	0.36	0.05	0.01	0.2	0.1	0.005	5.78
	11623	Herring Fillets in Tomato Sauce	0.68	1.10	0.007	0.12	0.954	8	0.03	0.49	0.05	0.01	0.3	0.1	0.005	9.90
	11653	Kippers	0.25	1.42	0.012	0.10	0.745	10	0.03	0.23	0.05	0.01	0.4	0.5	0.005	7.40

Type	Sample number	Product description	Concentration of metal (mg/kg)													
			Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Tl	Zn
	11669	Kipper Fillets	0.32	1.40	0.005	0.10	0.870	8	0.04	0.23	0.05	0.01	0.2	0.1	0.005	7.00
	11670	Rollmops	0.25	1.62	0.005	0.11	1.172	11	0.02	0.26	0.05	0.01	0.4	0.1	0.005	2.80
	11640	Herring Fillets in Brine and Own Juices	0.45	1.49	0.005	0.14	0.935	12	0.05	1.19	0.07	0.01	0.3	0.1	0.005	16.89
Lobster	11551	Cooked Crayfish	0.46	0.10	0.052	0.16	13.956	5	0.05	2.64	0.05	0.02	0.4	0.1	0.005	23.00
	11609	Lobster Cooked & Dressed	0.54	7.90	0.130	0.05	25.000	2	0.25	0.74	0.05	0.01	0.6	0.1	0.005	37.00
	11625	Cooked Lobster	1.43	12.58	0.057	0.19	46.091	5	0.20	1.95	0.05	0.04	1.1	0.1	0.005	43.79
	11565	Squat Lobster	4.12	3.68	0.085	0.11	1.681	12	0.02	1.49	0.05	0.01	0.3	0.1	0.005	4.73
	11690	Scampi Bites	12.00	0.98	0.006	0.17	1.600	10	0.03	1.70	0.48	0.01	0.2	0.1	0.005	4.00
Mackerel	11595	Smoked Mackerel Pate	0.25	1.40	0.005	0.06	0.530	7	0.02	0.09	0.05	0.01	0.2	0.1	0.005	6.10
	11590	Smoked mackerel (display label)	0.25	2.20	0.006	0.09	0.910	12	0.03	0.10	0.05	0.01	0.2	0.1	0.005	8.00
	11654	Smoked Mackerel	1.11	1.59	0.005	0.20	0.827	14	0.08	0.26	0.05	0.03	0.4	0.1	0.005	8.66
	11659	Lemon & Parsley Smoked Mackerel Fillets	0.37	2.20	0.005	0.13	0.970	13	0.05	0.48	0.05	0.01	0.3	0.1	0.005	7.90
	11666	Smoked Mackerel Ready to Eat - Peppered	0.74	2.60	0.007	0.08	1.100	11	0.05	0.69	0.05	0.01	0.4	0.1	0.005	9.60
	11678	Smoked Scottish Mackerel Strips	0.25	2.20	0.007	0.10	0.570	9	0.06	0.06	0.05	0.01	0.2	0.1	0.005	6.40
	11614	Mackerel Fillets in Brine	0.36	0.85	0.005	0.09	0.681	9	0.05	0.08	0.05	0.01	0.4	0.1	0.005	3.83
Miscellaneous	11668	Smoked Halibut	0.96	1.31	0.005	0.14	0.142	2	0.02	0.08	0.05	0.04	0.2	0.1	0.005	2.42
	11573	Gefilte fish	1.05	0.05	0.010	0.07	0.308	5	0.03	1.06	0.05	0.01	0.2	0.2	0.005	5.36
	11627	Sild in Sunflower Oil	0.25	1.86	0.006	0.12	0.635	13	0.03	1.34	0.05	0.01	0.2	0.1	0.005	12.32
	11568	Unsweet Fried Fish Balls	0.85	2.91	0.005	0.15	0.449	8	0.13	0.79	0.05	0.01	0.3	0.1	0.005	2.95
	11675	4 Breaded White Fish Portions	0.40	0.54	0.005	0.07	0.610	5	0.03	1.50	0.05	0.01	0.2	0.1	0.005	3.80
	11691	Fish Cakes (at time of purchase)	0.57	0.76	0.007	0.07	0.560	8	0.03	1.90	0.05	0.01	0.2	0.1	0.005	3.30
	11542	16 Seafood Sticks	5.62	0.16	0.005	0.13	0.270	3	0.02	0.34	0.05	0.04	0.2	0.1	0.005	2.59
	11574	Fish Soup	0.38	0.57	0.005	0.05	0.134	3	0.03	0.14	0.05	0.01	0.2	0.1	0.005	2.97
	11579	16 Seafood Sticks	1.41	0.14	0.005	0.10	0.253	2	0.05	0.23	0.05	0.01	0.3	0.1	0.005	2.38
	11601	20 Seafood Sticks with 2 Flavoured Dips	4.90	0.09	0.005	0.05	0.270	3	0.03	0.50	0.05	0.01	0.2	0.1	0.005	1.50
	11636	16 Seafood Sticks	6.57	0.06	0.012	0.11	0.387	8	0.02	0.66	0.05	0.02	0.2	0.1	0.005	0.20
	11641	French Fish Soup with Muscadet	0.67	1.37	0.005	0.06	0.258	4	0.02	0.35	0.05	0.01	0.2	0.1	0.005	2.52
	11672	20 Seafood Sticks	4.00	0.08	0.005	0.05	0.310	3	0.03	0.16	0.05	0.01	0.2	0.1	0.005	1.10
	11684	Sandwich Filling Seafood Cocktail	0.94	0.60	0.008	0.08	0.500	3	0.03	0.21	0.05	0.01	0.2	0.1	0.005	2.90
	11685	Ocean Stix	4.60	0.10	0.005	0.05	0.300	3	0.04	0.50	0.05	0.01	0.2	0.1	0.005	1.50
11543	Catfish	1.69	0.35	0.005	0.18	0.578	22	0.03	2.29	0.05	0.12	0.9	0.1	0.005	38.38	

Type	Sample number	Product description	Concentration of metal (mg/kg)													
			Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Tl	Zn
	11591	Fresh Golden Cutlets - Whiting, cold smoked (display label)	0.30	4.50	0.005	0.09	0.210	2	0.10	0.20	0.05	0.01	0.3	0.1	0.005	2.80
	11665	Arbroath Smokies	0.25	4.60	0.005	0.19	0.250	2	0.19	0.12	0.05	0.01	0.2	0.1	0.005	4.70
	11582	Blanchbait	0.41	0.08	0.024	0.10	0.473	7	0.02	2.28	0.05	0.02	0.2	0.1	0.005	11.46
	11648	Jellied Eels	0.41	0.05	0.005	0.10	0.206	5	0.02	0.48	0.05	0.02	0.3	0.1	0.005	7.61
	11548	Fresh Swordfish Steaks with a Red Pepper Marinade (on display)	0.25	0.86	0.013	0.07	0.395	5	0.27	0.22	0.05	0.01	0.5	0.1	0.005	8.17
	11663	Hot Smoked Trout Fillets	0.25	1.25	0.005	0.30	0.580	4	0.03	0.18	0.05	0.01	0.4	0.1	0.005	5.08
Molluscs	11578	Scallops in Seafood Sauce with Olive Oil	11.44	1.60	0.518	0.21	1.385	35	0.02	13.71	0.10	0.35	0.4	0.1	0.005	45.34
	11540	Cooked Irish Mussels in Mediterranean Sauce	3.00	0.98	0.026	0.08	0.822	9	0.02	1.38	0.06	0.07	0.3	0.1	0.005	7.03
	11544	Cooked Winkles	18.11	5.08	0.183	0.21	17.257	90	0.03	9.28	0.53	0.30	0.3	0.1	0.005	18.31
	11552	Cooked Whelks	1.79	22.00	0.328	0.08	10.670	13	0.07	1.08	0.13	0.08	0.3	0.1	0.005	43.90
	11553	Green Lipped Mussels - Cooked	38.19	2.00	0.089	0.18	1.047	63	0.03	1.89	0.13	0.09	0.5	0.1	0.005	16.80
	11554	Cooked Cockles	59.30	1.16	0.034	0.34	0.877	170	0.03	5.61	2.06	0.30	0.4	0.1	0.005	14.91
	11561	Cooked Mussels	9.75	3.40	0.560	0.15	1.870	30	0.02	1.98	0.20	0.02	0.7	0.1	0.005	31.51
	11563	Seafood Cocktail	7.37	0.54	0.154	0.15	1.880	19	0.02	0.74	0.05	0.03	0.3	0.1	0.005	11.93
	11592	Traditional Mussels off the Shell Cooked - Ready to Eat (display label)	6.00	1.30	0.110	0.13	1.300	50	0.03	2.80	0.23	0.17	0.4	0.1	0.005	23.00
	11593	New Zealand Greenshell Mussels	44.00	3.10	0.290	0.13	1.000	65	0.03	1.80	0.24	0.17	0.6	0.1	0.005	16.00
	11602	IQF Mussel Meat Scallops with Roasted Garlic Butter	0.26	2.00	0.130	0.05	0.190	5	0.03	0.17	0.05	0.01	0.3	0.1	0.005	13.00
	11610	Marinated Whelks	1.14	12.00	0.781	0.45	42.251	16	0.08	2.78	0.30	0.30	1.5	0.1	0.005	73.77
	11612	Cooked Mussels	7.47	4.68	0.562	0.74	6.496	52	0.02	10.77	0.28	1.04	1.5	0.2	0.005	80.81
	11621	Cockles	180.00	0.72	0.017	0.43	0.989	243	0.05	5.53	1.40	0.62	0.2	0.1	0.005	9.05
	11658	Seafood Cocktail	19.00	0.99	0.170	0.14	1.200	64	0.03	1.90	0.26	0.15	0.4	0.1	0.005	13.00
	11662	Seafood Selection	7.50	0.72	0.077	0.09	1.300	25	0.03	1.40	0.11	0.09	0.3	0.1	0.005	11.00
	11673	Mussels Cooked and Shelled	16.00	1.50	0.110	0.12	2.500	50	0.03	4.10	0.37	0.25	0.6	0.1	0.005	28.00
	11679	Cooked Winkles	32.20	10.30	0.411	0.90	42.343	173	0.02	15.00	2.10	1.17	1.1	0.1	0.006	37.54
	11681	Bigorneaux (cooked winkles at time of purchase)	5.30	4.40	0.190	0.13	10.000	71	0.03	7.70	0.43	0.15	0.2	0.1	0.005	16.00
	11682	Mussels in a Garlic Butter Sauce	5.91	1.33	0.069	0.14	0.840	18	0.02	1.20	0.07	0.14	0.5	0.2	0.005	15.92
	11683	Cooked Shelled Cockles	170.00	1.90	0.054	0.54	1.300	410	0.04	10.00	4.70	0.61	0.4	0.1	0.005	18.00

Type	Sample number	Product description	Concentration of metal (mg/kg)													
			Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Tl	Zn
	11699	Spicy Mussels	9.47	0.89	0.086	0.20	1.125	33	0.02	0.73	0.08	0.13	0.2	0.1	0.005	14.86
	11583	Cooked Frozen Whelks	0.30	21.27	0.332	0.05	6.756	9	0.03	0.90	0.05	0.02	0.4	0.1	0.005	24.00
	11587	Cooked Chilean Mussel Meat - 1QF Ice Glazed	12.66	2.74	0.688	0.29	2.332	31	0.02	1.84	0.07	0.04	0.9	0.1	0.005	49.62
	11588	Seafood Cocktail	11.35	0.87	0.056	0.11	2.239	41	0.03	1.82	0.53	0.14	0.4	0.5	0.005	13.29
	11633	Cooked Winkles	30.64	2.85	0.314	0.33	25.363	151	0.08	8.61	1.32	0.34	1.1	0.1	0.005	20.27
	11645	Pickled Mussels	18.91	1.44	0.055	0.21	1.648	51	0.04	1.56	0.31	0.24	0.5	0.1	0.005	11.66
	11646	Pickled Cockles	170.00	1.07	0.021	0.47	1.424	252	0.04	6.37	2.56	0.26	0.4	0.2	0.005	8.99
	11577	Octopus Chunks in Olive Oil	0.77	1.48	0.157	0.10	3.347	3	0.07	0.15	0.05	0.01	0.6	0.1	0.005	30.97
	11697	Crispy Calamari	1.00	0.14	0.056	0.08	1.200	8	0.03	3.10	0.05	0.01	0.2	0.1	0.005	6.70
	11539	Octopus Salad	3.01	0.95	0.374	0.18	5.306	8	0.03	0.55	0.06	0.05	0.4	0.1	0.005	13.82
	11585	Whole Cooked Spanish Octopus Vulgaris	1.26	14.12	0.035	0.16	8.928	3	0.04	0.66	0.05	0.01	0.5	0.1	0.005	24.43
	11589	Smoked Oysters in Cottonseed Oil	22.00	2.53	0.758	0.13	21.000	47	0.02	8.67	0.05	0.18	0.7	0.2	0.005	190.00
Prawns	11626	Shrimps in Brine	14.24	0.51	0.027	0.07	3.375	21	0.04	1.34	0.05	0.04	0.5	0.1	0.005	11.37
	11547	Prawns in Chilli Sauce	0.25	1.15	0.007	0.16	0.708	2	0.03	0.28	0.05	0.01	0.2	0.1	0.005	4.95
	11556	Tiger Prawns	1.29	0.24	0.005	0.08	1.486	2	0.02	0.73	0.05	0.01	0.3	0.1	0.005	12.26
	11558	Cooked Crevettes	3.86	4.74	0.007	0.08	8.536	7	0.02	0.30	0.05	0.01	0.2	0.1	0.005	17.55
	11560	Medium Prawns	0.25	4.89	0.019	0.08	1.546	2	0.03	0.18	0.05	0.01	0.2	0.1	0.005	9.60
	11567	Cooked & Peeled North Atlantic Prawns	0.46	15.77	0.012	0.16	1.166	3	0.02	0.17	0.05	0.01	0.2	0.1	0.005	7.39
	11594	Large Luxury Prawns	0.57	1.90	0.013	0.11	1.200	2	0.03	0.15	0.05	0.01	0.2	0.1	0.005	8.30
	11599	Cooked Whole Prawns in Shell	0.65	10.00	0.240	0.08	11.000	3	0.06	0.23	0.08	0.01	0.3	0.1	0.005	13.00
	11600	Cooked King Prawns	0.58	0.26	0.005	0.05	1.400	2	0.03	0.16	0.05	0.01	0.3	0.1	0.005	10.00
	11611	North Atlantic Prawns	0.26	6.94	0.086	0.40	4.176	2	0.02	0.11	0.05	0.01	0.6	0.1	0.005	6.23
	11613	North Atlantic Prawns	0.50	16.73	0.017	0.09	1.448	4	0.02	0.18	0.05	0.01	0.2	0.1	0.005	8.24
	11628	Large King Prawns	2.14	0.27	0.005	0.08	3.056	2	0.02	0.91	0.05	0.01	0.2	0.1	0.005	11.41
	11629	Large Prawns	0.90	2.73	0.036	0.14	1.491	2	0.04	0.13	0.05	0.04	0.3	0.1	0.005	9.15
	11634	Cooked Brown Shrimp	1.10	6.92	0.039	0.20	12.371	9	0.06	0.73	0.05	0.04	0.6	0.1	0.005	30.01
	11639	King Prawns	2.14	1.08	0.023	0.09	1.068	3	0.02	0.20	0.05	0.01	0.3	0.1	0.005	8.79
	11651	North Atlantic Prawns	0.30	0.72	0.007	0.05	1.049	2	0.05	0.21	0.05	0.01	0.2	0.1	0.005	9.17
	11660	Large Cooked & Peeled Prawns	0.64	3.60	0.014	0.05	1.700	2	0.06	0.17	0.11	0.01	0.2	0.1	0.005	9.90
	11664	Prawn Cocktail	0.45	4.60	0.007	0.06	0.680	2	0.03	0.14	0.05	0.01	0.2	0.1	0.005	3.40
	11671	King Prawns	1.40	0.42	0.005	0.07	1.700	3	0.03	0.37	0.18	0.03	0.3	0.1	0.005	8.60
	11676	Scottish Cooked & Peeled Cold Water Prawns	0.39	16.00	0.014	0.15	1.400	1	0.03	0.11	0.05	0.01	0.2	0.1	0.005	7.70

Type	Sample number	Product description	Concentration of metal (mg/kg)													
			Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Tl	Zn
	11680	Crevettes Grises Entieres (shrimps at time of purchase)	1.30	6.80	0.033	0.08	9.700	6	0.07	0.67	0.13	0.01	0.6	0.1	0.005	24.00
	11698	Cooked Crevette	11.00	11.00	0.050	0.09	10.000	14	0.07	0.52	0.05	0.01	0.3	0.1	0.005	14.00
	11536	Cantonese 6 Prawn Spring Rolls	1.57	0.41	0.014	0.12	0.975	7	0.02	1.87	0.05	0.05	0.2	0.6	0.005	2.20
	11545	Prawn Cocktail	0.60	0.96	0.019	0.09	0.741	5	0.03	0.19	0.05	0.01	0.2	0.1	0.005	5.36
Roe	11557	Herring Roe	0.25	0.46	0.005	0.05	0.723	11	0.02	2.46	0.05	0.01	0.3	0.1	0.005	5.64
	11569	Smoked Cod Roe (verbal)	0.83	0.70	0.005	0.17	0.977	9	0.03	0.68	0.05	0.01	1.1	0.1	0.005	44.46
	11606	Lumpfish Caviar	0.39	0.37	0.010	0.12	0.260	5	0.03	0.21	0.05	0.01	0.6	0.1	0.005	7.90
	11607	Pressed Cod Roe	0.67	0.35	0.009	0.11	0.740	7	0.02	0.39	0.05	0.01	0.7	0.1	0.005	20.55
	11649	Soft Cod Roes	0.58	0.53	0.005	0.05	0.381	5	0.03	0.28	0.05	0.01	0.2	0.1	0.005	6.49
	11656	Lumpfish Caviar	0.46	0.13	0.005	0.19	0.215	3	0.02	0.23	0.05	0.02	0.3	0.3	0.005	8.69
	11694	Smoked Cooked Cod Roe (at time of purchase)	0.28	0.47	0.005	0.06	0.720	10	0.03	0.61	0.05	0.01	1.1	0.1	0.005	36.00
	Salmon	11598	Wild Red Salmon	0.39	0.27	0.009	0.05	0.690	9	0.05	0.19	0.05	0.01	0.3	0.1	0.005
11604		Pink Salmon	0.25	0.24	0.005	0.05	0.480	5	0.03	0.38	0.05	0.03	0.3	0.1	0.005	5.00
11652		Wild Pacific Pink Salmon	0.25	0.41	0.005	0.05	0.648	7	0.03	0.35	0.05	0.01	0.3	0.1	0.005	8.12
11546		Wild Red Salmon	0.43	0.33	0.005	0.05	0.850	7	0.03	0.90	0.05	0.01	0.4	0.1	0.005	6.92
11615		Red Salmon	3.66	0.31	0.005	0.05	0.771	6	0.04	0.34	0.05	0.01	0.3	0.1	0.005	6.48
11616		Red Salmon	12.61	0.25	0.010	0.15	0.648	17	0.05	0.23	0.05	0.01	0.3	0.1	0.005	8.79
11619		Sockeye Wild Pacific Red Salmon	0.25	0.34	0.005	0.05	0.676	6	0.03	0.24	0.05	0.01	0.3	0.1	0.005	9.18
11624		Pink Salmon - Wild Pacific	1.89	0.36	0.005	0.08	0.758	12	0.02	0.37	0.05	0.01	0.3	0.1	0.005	8.85
11538		2 Salmon Fishcakes	1.13	0.67	0.008	0.06	0.571	6	0.02	1.58	0.05	0.03	0.2	0.1	0.005	2.01
11575		Salmon Batons	2.21	0.54	0.010	0.12	0.713	9	0.02	1.22	0.05	0.01	0.2	0.1	0.005	3.59
11630		Salmon Fillet in Lemon & Dill Crumb	0.73	0.06	0.005	0.08	0.491	5	0.02	1.13	0.05	0.01	0.2	0.1	0.005	1.62
11570		Salmon Pate	0.39	1.02	0.005	0.23	0.313	6	0.02	0.30	0.05	0.01	0.3	0.1	0.005	3.63
11638		Poached Salmon & Cucumber	0.37	0.58	0.005	0.08	0.226	4	0.02	0.34	0.05	0.01	0.2	0.2	0.005	3.30
11642		Salmon Paste	1.43	0.73	0.005	0.12	0.421	80	0.03	1.70	0.05	0.03	0.2	0.1	0.005	3.85
11643		Smoked Salmon Pate	1.58	0.90	0.005	0.14	0.414	12	0.05	0.42	0.05	0.03	0.2	0.4	0.005	4.83
11655		Salmon Paste	1.28	0.85	0.007	0.11	0.470	79	0.02	1.80	0.05	0.01	0.2	0.5	0.005	5.81
11686		Salmon Paste	3.50	1.40	0.005	0.22	0.580	74	0.03	1.80	0.14	0.01	0.2	0.1	0.005	6.60
11689		Salmon Paste	1.76	0.89	0.005	0.11	0.464	323	0.04	1.76	0.05	0.03	0.2	0.1	0.005	6.00
11576		Organic Salmon	0.25	0.87	0.005	0.27	0.288	5	0.03	0.13	0.05	0.01	0.3	0.1	0.005	2.64

Type	Sample number	Product description	Concentration of metal (mg/kg)													
			Al	As	Cd	Cr	Cu	Fe	Hg	Mn	Ni	Pb	Se	Sn	Tl	Zn
	11647	Smoked Salmon Trimmings	0.28	1.75	0.005	0.25	0.363	3	0.03	0.14	0.05	0.01	0.3	0.1	0.005	3.10
	11693	Smoked Scottish Salmon	0.25	1.60	0.005	0.08	0.470	4	0.03	0.08	0.05	0.01	0.2	0.1	0.005	3.90
Sardines	11537	Sardines in Tomato Sauce	2.72	1.13	0.028	0.10	1.219	24	0.02	1.58	0.05	0.03	0.3	0.1	0.008	13.12
	11580	Sardines in Brine	6.83	1.12	0.057	0.10	1.139	28	0.02	1.36	0.05	0.02	0.4	0.1	0.008	18.78
	11597	South Atlantic Pilchards in Tomato Sauce	0.45	1.12	0.044	0.05	1.565	25	0.02	1.52	0.05	0.01	0.3	0.3	0.015	7.53
	11688	Sardines in Brine	2.02	1.82	0.100	0.05	1.124	30	0.02	1.63	0.05	0.02	0.3	0.2	0.005	14.31
	11584	Portuguese Sardine Pate	0.85	0.81	0.017	0.30	0.909	12	0.02	2.07	0.11	0.05	0.2	0.1	0.005	8.09
Tuna	11605	Tuna Chunks in Brine	0.25	1.15	0.030	0.05	0.765	10	0.11	0.12	0.05	0.01	0.7	0.5	0.005	5.96
	11608	Tuna Chunks in Sunflower Oil	0.25	0.85	0.016	0.08	0.575	9	0.03	0.07	0.05	0.01	0.7	0.1	0.005	5.85
	11687	Tuna in Olive Oil with Lemon & Herbs	0.61	0.74	0.009	0.08	0.655	5	0.02	1.17	0.05	0.01	0.6	0.1	0.005	4.99
	11696	Tuna Flakes in Brine	0.30	0.97	0.061	0.08	0.646	12	0.03	0.16	0.05	0.01	0.6	0.1	0.005	7.88
	11550	Tuna Steaks in Brine	0.25	1.67	0.046	0.05	0.622	13	0.29	0.07	0.05	0.01	0.9	0.1	0.005	4.09
	11564	Tuna in Tomato & Herb Dressing	1.41	0.22	0.009	0.06	0.785	8	0.02	0.91	0.05	0.01	0.2	0.1	0.005	2.44
	11617	Tuna Flakes in Brine	0.47	1.02	0.111	0.05	0.680	24	0.09	0.10	0.05	0.01	0.8	0.1	0.005	6.31
	11618	Tuna Chunks in Brine	0.25	0.63	0.023	0.05	0.368	10	0.44	0.06	0.05	0.01	0.9	0.1	0.005	5.45
	11631	Tuna Chunks in Brine	2.40	0.67	0.043	0.05	0.374	10	0.08	0.06	0.05	0.01	0.7	0.1	0.005	4.35
	11555	Tuna in a Red Chilli and Lime Dressing	0.72	0.66	0.027	0.06	0.521	9	0.19	0.24	0.05	0.01	0.8	0.1	0.005	4.58
	11620	Tuna Pate	0.28	1.53	0.013	0.28	0.874	10	0.02	0.79	0.05	0.01	0.8	0.1	0.005	6.64
11657	Tuna & Mayonnaise Paste	1.44	0.83	0.016	0.10	0.655	11	0.03	1.43	0.05	0.03	0.3	0.1	0.005	4.90	

Annex 3 Responses from brand owners of products with high levels of contaminants

CASTLE MACLELLAN FOODS LTD

While the recognised approved limit for cadmium in white crab meat is 0.5 mg/kg, brown meat has specifically been excluded from the regulations. This is because there is a large body of data which supports the contention that the presence of heavy metals in brown crab meat both fluctuates greatly and is unpredictable — even from crabs fished in the same area.

The identification of high isolated readings in occasional samples of brown meat over the past 30 years masks the fact that by far the majority of sampling done shows a very low or zero presence of cadmium.

Castle MacLellan Foods Ltd and Orkney Fisherman's Society are well versed in the body of UK research that has taken place over the past 40 years with regard to brown crab, and are confident that the occasional isolated identification of low levels of cadmium in Luxury Orkney crab Pâté does not constitute a risk to public health.

PRINCES LTD

We can confirm that Shippams Crab Spread only contains brown crab meat. Brown crab meat is not subject to the EU Commission Regulations 78/2005 regarding heavy metals in fish and fish products.

We are committed to ensuring that all of our products meet legal limits set by the EU.

We welcome the FSA's independent testing of our fish products and will continue to constantly monitor levels and review ingredients in order to meet our own rigorous standards.