

FINAL REPORT

A SURVEY OF CADMIUM IN BROWN CRABMEAT AND BROWN CRABMEAT PRODUCTS

FS102010

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**Centre for Environment, Fisheries & Aquaculture
Sciences (Cefas)**



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Project Manager:	Thi Bolam
Report compiled by:	Thi Bolam and Philippe Bersuder
Quality control by:	Steven Morris
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Final Report

Cefas Project C5700 – A survey of cadmium in brown crabmeat and brown crabmeat products

Authors: Thi Bolam and Philippe Bersuder

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Commissioned by: The Food Standards Agency
Area 3B Aviation House,
125 Kingsway,
London,
WC2B 6NH

Contact person: Richard Burden
e-mail: Richard.Burden@foodstandards.gsi.gov.uk



Head office
Centre for Environment, Fisheries & Aquaculture Science
Pakefield Road, Lowestoft, Suffolk NR33 0HT, UK
Tel +44 (0) 1502 56 2244 Fax +44 (0) 1502 51 3865
www.cefas.co.uk

Cefas is an executive agency of Defra

Executive Summary

The European Commission has recommended that Member States should provide advice on brown crabmeat consumption to their consumers as the brown meat from crabs (brown crabmeat) has the potential to contain elevated levels of cadmium (Cd). To date, information collated by the United Kingdom's (UK) food industry on Cd concentrations in brown crabmeat and its products on sale in the UK has not been sufficient to allow the Food Standards Agency (FSA) to provide this advice. To address this paucity of information, 399 samples of brown crabmeat and its products were collected from UK retail outlets between July and September 2012 and chemically analysed for Cd.

A sampling plan based on estimated population distribution within the UK in 2010 was designed to target a representative range of brown crabmeat and brown crabmeat products available from various retail outlets across twenty settlements in the UK. Sample traceability was ensured through the use of unique sample numbers and detailed information recording (including digital photographs). Where a deficiency in samples was recorded in any particular location, the shortfall was offset with online/mail orders. Samples collected were transported to the Cefas Laboratory in Lowestoft and stored under appropriate conditions to ensure that their integrity was preserved.

The accredited and validated methodology used for the analysis was based on the acid digestion of brown crabmeat samples using an enclosed vessel microwave. The determination of Cd was performed by Inductively Coupled Plasma-Mass Spectrometry. The method has been extensively validated for brown crabmeat and dressed crabs. In addition, the approaches have been applied in inter-comparison exercises involving the European Union Reference Laboratory and specialist laboratories from Member States. However, the analysis of Cd in other brown crabmeat products (such as crab spreads, crab pâté) is outside our scope of accreditation. We thus applied our validated method (for marine biota including fish and shellfish) to these more diverse crab products that were purchased. To generate method performance information applicable to these particular products, we performed matrix fortification exercises. The results of these exercises were within the method performance criteria and demonstrated that the method was valid for brown crabmeat products.

For all products, Cd concentration ranged from 0.01 to 26 mg/kg wet weight (w.w.). The mean and median Cd concentrations were found to be 3.4 and 2.8 mg/kg w.w., respectively. Although there is no limit for Cd in brown crabmeat, these average concentrations were observed to be higher than the permitted maximum level of 0.50 mg[Cd]/kg in that applies to the white meat

from crab legs and claws . The concentration data reported here will thus support the FSA's risk assessment and management processes regarding the safety of consuming brown crab meat products that are available for purchase in the UK.

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Glossary

Cd	Cadmium
CRM	Certified Reference Material
(<i>d</i>) _r	Relative percent difference
EC	European Commission
EU	European Union
EFSA	European Food Safety Authority
FSA	United Kingdom's Food Standards Agency
ICP-MS	Inductively Coupled Plasma-Mass Spectrometry
LIMS	Laboratory Information Management System
MRL	Maximum Residue Level
LSN	Laboratory Sample Number
RASFF	Rapid Alert System for Food and Feed
TWI	Tolerable Weekly Intake
w.w.	Wet weight

1 Introduction

1.1 Background

Seafood provides a source of nutrition to the human consumer. It can also contribute to the human exposure to potentially toxic trace elements such as heavy metals inadvertently present in the food chain as a result of anthropogenic activities or natural sources. More specifically, levels of cadmium (Cd) present in the brown meat of edible crab have long been reported to be relatively high, well above levels measured in the so-called “white meat” from legs and claws (Davies, 1981).

While European legislation sets a maximum level of 0.50 mg[Cd]/kg wet weight (w.w.) for crab (European Commission, 2011a), this regulation only applies to the edible “white meat” component of the crab’s appendages (*i.e.*, legs and claws). It excludes the cephalothorax and other inedible parts from the shell and the crab’s tail. The cephalothorax, or the “brown meat”, comprises the digestive organ or hepatopancreas which is known to bioaccumulate measurable levels of Cd.

In November 2007, the Italian food authority raised several notifications specific to Cd levels in edible crab on the European Commission’s (EC) Rapid Alert System for Food and Feed (RASFF). To date, over 80 such notifications have been submitted to the RASFF by European Union (EU) Member States (RASFF, 2012). Cadmium toxicity was recently reassessed by the European Food Safety Authority (EFSA) which resulted in a decreased Tolerable Weekly Intake (TWI) for Cd from a provisional 7 µg/kg to 2.5 µg/kg body weight (EFSA, 2009). This implies that a person with a body weight of 70 kg should take in no more than 0.175 mg Cd per week or 0.025 mg Cd per day. The UK population dietary exposure to Cd was estimated to be 0.011 - 0.013 mg per day per person in 2006 (FSA, 2009). Since brown crabmeat is eaten in the UK, there is the possibility that regular crab consumers may be exposed to elevated Cd levels.

The EC released an information note to raise awareness to national authorities on the consumption of brown crabmeat (EC, 2011b) with the anticipation that individual Member States will produce consumption advice relevant to their consumers. To date and as the UK’s competent food authority, the Food Standards Agency (FSA) does not possess sufficient evidence to provide this advice. It was the overall objective of the brown crabmeat survey reported herein to provide an acceptable data base which describes the range of Cd concentrations in brown crabmeat and food products containing brown crabmeat currently sold in UK retail outlets that are readily available to the UK consumer.

This survey provides quality assured evidence with regards to levels of Cd in 397 foods containing crab brown meat. The concentration data reported here will thus support the FSA's risk assessment and management processes regarding the safety of consuming brown crab meat products that are available for purchase in the UK.

2 Methods

The study was based on two distinct phases. The first phase involved the collection of 399 samples of food products containing brown crabmeat following a detailed sampling plan. Following this, samples were prepared for analysis and the determination of cadmium (Cd) and other trace elements using reliable, quality assured analytical methodologies.

2.1 Sampling strategy and plan

The sampling strategy was to collect by purchasing, brown crabmeat and products containing brown crabmeat that are representative of products on sale in the retail market throughout the whole of the United Kingdom (UK). Products prepared outside of the UK were also included in the retail survey. However, market information with regards to brown crabmeat consumption in the UK was not available, and the sampling plan was initially designed based on limited market research data supplied by Seafish (Nielsen, 2012), a reputable provider of retail and consumer measurements. Crab food products sold in the UK were classified into three sectors, with market share based on volumes sold (expressed in %) over the year to date: fresh crab (49%), ambient crab (42%) and frozen crab (9%). No information specific to white meat versus brown meat market shares was available, and it was assumed that volumes sold were equivalent to that of white crabmeat products.

Since market information with regards to crab consumption specific to the UK's constituent countries was not available, the rationale for sample numbers to be collected in each country was simply based on estimated population distribution within the UK in 2010 (Office of National Statistics, 2011). Table 1 provides a breakdown of targeted samples to be collected in England, Scotland, Northern Ireland and Wales, with indicative numbers by market sector (based on volumes sold) which was used as an initial framework to design the sampling plan.

The distribution within market sectors was provided as a general guidance rather than a strict plan, as for example, pet food containing brown crabmeat or canned white meat were not applicable for this survey, but would be included in the market data for the Ambient sector. The type of food

products containing brown crabmeat were subsequently researched extensively using the internet searching and grouped into five categories as detailed in Table 2.

Table 1: Sample numbers to be collected within each constituent country with indicative numbers within sector

Country	Population (thousands)	Total Sample Number	Ambient (42%)	Fresh (49%)	Frozen (9%)
England	52 234	336	141	165	30
Northern Ireland	1 799	12	5	6	1
Scotland	5 222	33	14	16	3
Wales	3 006	19	8	9	2
<i>Total</i>	<i>62 261</i>	<i>400</i>	<i>168</i>	<i>196</i>	<i>36</i>

Source: Office of National Statistics, 2011

Table 2: Description of product categories

Product category number	Product category	Description	Product state at point of purchase
1	100% brown crabmeat Brown crabmeat will be mostly from the species <i>Cancer pagurus</i> but brown meat from other species that fall under the definition of 'crab' in the Fish Labelling Regulations 2010 (All species of the order Brachyura, all species of the family Lithodidae) will be obtained based on their availability at the time of purchase (e.g. from online retailers)	a) Live whole crab, unprocessed and not cooked b) Cooked whole crab c) Cooked brown crabmeat that has already been extracted (pasteurised or unpasteurised)	Live and stored chilled or refrigerated Fresh, vacuum packed or frozen Fresh or frozen
2	Dressed crab	Processed by cleaning inside of crab body. Brown and white meat cooked (pasteurised) and then repacked into crab body cavity	Fresh, vacuum packed or frozen
3	Crab pastes & spreads (including thai crab pastes)	Brown meat minced with cereal filler & ingredients, jarred, sealed and pasteurised.	In jar
4	Crab pâtés, terrines and potted crab meat	Brown meat plus white meat (including fish) cooked, chilled and placed in pot, bowl or terrine then overlain with melted butter, and chilled	Fresh in pot or in terrine
5	Miscellaneous	a) Canned brown or mixed crab meat (pasteurised, canned for long term shelf life or refrigerated) b) Crab cakes (brown and white meat pasteurised and meats mixed with other ingredients to prepare moulded cakes) c) Crab soup (white and brown crab meat added to pureed vegetable & fish stock) d) Other (e.g. crab meat extract, ready meals)	Canned, ambient or fresh Fresh or frozen In jar or canned In jar or fresh or frozen

A total of 400 (+10% for duplicate analyse) samples were planned for the survey, and these were distributed between categories using market information for each sector, information collected through internet search on retailers selling foods containing brown crabmeat and in discussion with the Food Standards Agency (Table 3).

Table 3: Number of samples to be purchased by category and type of retailer

Product category number	Total number of samples	Type of retailer	Number of samples per retailer
1	200	Supermarket	80
		Small retail market	20
		Fish monger/market stall	80
		On-line/mail order	20
2	60	Supermarket	30
		Small retail market	2
		Fish monger/market stall	20
		On-line/mail order	8
3	60	Supermarket	48
		Small retail market	6
		Fish monger/market stall	n/a
		On-line/mail order	6
4	60	Supermarket	48
		Small retail market	5
		Fish monger/market stall	2
		On-line/mail order	5
5	20	Supermarket	10
		Small retail market	3
		Fish monger/market stall	2
		On-line/mail order	5

Samples were planned to be purchased from twenty settlements throughout the UK and through online/mail orders. The twenty randomly selected settlements were to be distributed between the four UK countries: ten from England, five from Scotland, three from Wales and two from Northern Ireland. The number of settlements in each country was chosen to enable an urban/rural distinction.

The random selection of the 20 targeted settlements in England, Scotland, Wales and Northern Ireland was achieved by using various strata. The top stratum was based on population sizes of the settlements in each country, so as to have a representation of both urban and rural areas. The ratio of urban-to-rural settlements representative of population shares by settlements in England (Census 2001) and Scotland (Scottish Executive Urban Rural Classification 2003-2004) is approximately 80:20, and for Wales approximately 65:35 (Census, 2001). This was represented in the top stratum:

For England:

- two large urban areas (population >500 000)
- six other (smaller) urban settlements (10 000< population <500 000)
- two rural towns (population <10 000).

For Scotland:

- one large urban area (pop. >125 000)
- three additional but smaller urban settlements (10,000< pop. <125 000)
- one rural settlement (<3 000).

For Wales

- one large urban area (pop. >500 000)
- one other (smaller) urban settlement (10 000< pop. <500 000)
- one rural town (pop. <10 000).

For Northern Ireland

- one large urban area (pop. >500 000)
- one small town (pop. <10 000).

The second stratum was based on geographical (ceremonial) counties for England, council areas for Scotland, principal areas for Wales and districts for Northern Ireland:

- 48 in England, 32 in Scotland, 22 in Wales and 26 in Northern Ireland, with the counties/areas being divided into coastal counties/areas (i.e., 22 counties for England, 17 for Scotland and 15 for Wales) and non-coastal counties/areas (i.e., 26 for England, 15 for Scotland and 7 for Wales).

For England, randomly selected settlements were chosen from six different coastal and four different non-coastal counties, while Scottish settlements were selected from three different coastal and two different non-coastal areas and Welsh settlements from two different coastal and one non-coastal area. For Northern Ireland, a coastal/non coastal split was not relevant as only two settlements were sampled. Selection of settlements was achieved via a random process of elimination. For this, a unique number was allocated to each settlement within each population size and the settlements were randomly chosen using a random number generator (<http://www.random.org>, accessed 12/07/2012), starting with the settlements in the highest population group. Finally, we also used online-mail/order purchasing to compensate for any major gaps (e.g. North East of England) as the statistical random selection was considered to be skewed towards a geographic area and only a limited number of retailers were available in a particular rural

settlement (e.g. South West of England). The distribution of rural and urban locations randomly selected and online retailers for brown crabmeat product sampling is provided in Figure 1.

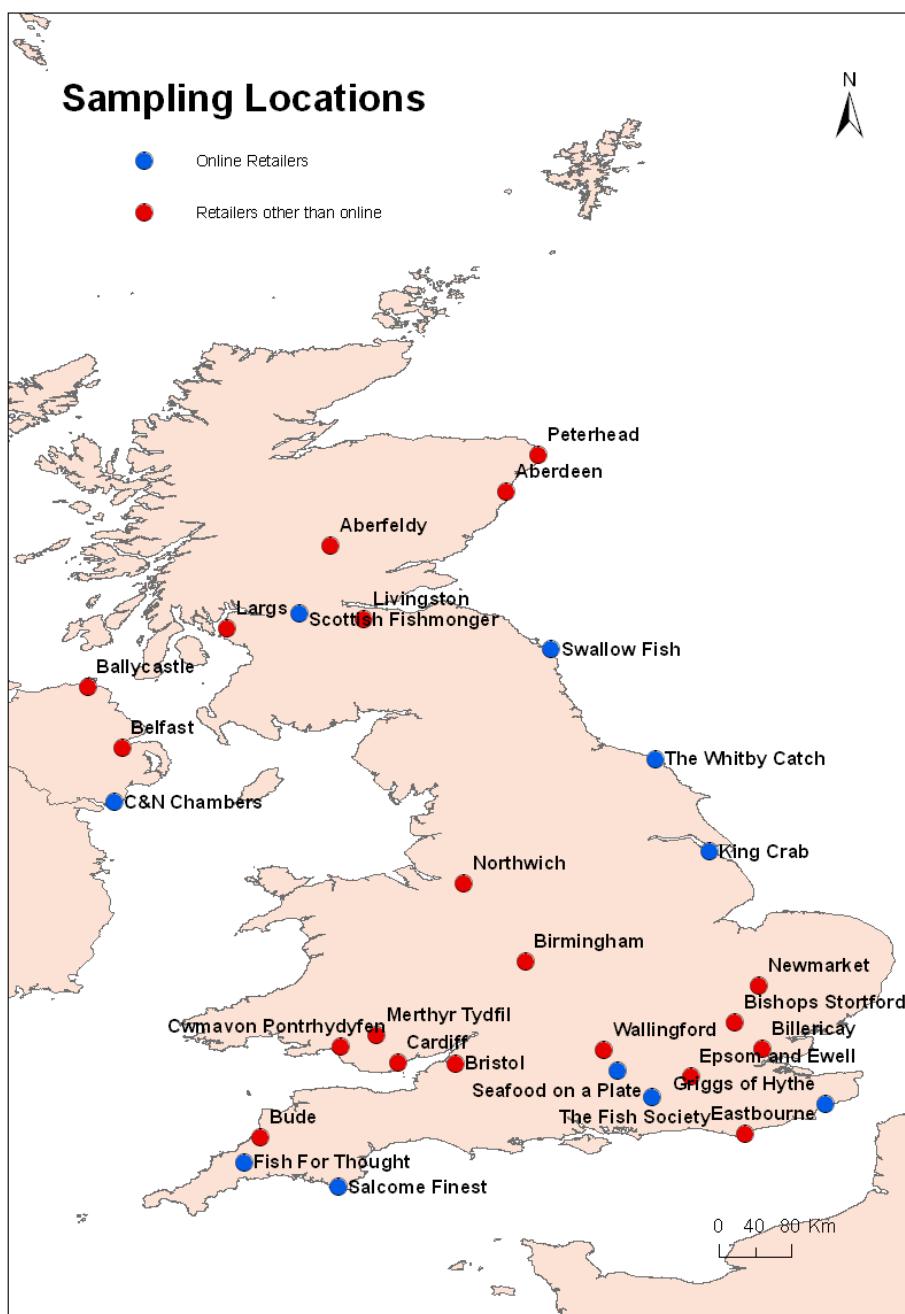


Figure 1: UK urban and rural settlements randomly selected for sampling brown crabmeat products

2.2 Sample receipt and storage

All samples collected were associated to a Sampling Information form (one form per sample or per batch of samples) which contained the following details (where available/applicable):

- Product description
- Brand name
- Manufacturer
- Unit size
- Country of origin
- Date of purchase
- Type of establishment purchased from and Name
- Purchase location and area
- Comments on purchase area
- Best-before date
- Use by date
- Batch code
- If available, the percentage brown crabmeat if given for brown crabmeat products
- Recommended portion size
- Additional comments (e.g. sample made up from several packs, etc.)

Digital photographs of sufficient quality were also taken of each sample. Images have been distributed separately to the FSA to minimise the size of this report.

All samples collected were stored in their purchased condition (ambient, fresh or frozen) for transport back to the Cefas Laboratory (Lowestoft; Suffolk) for subsequent sample preparation and analysis. Live crabs were humanely killed following guidance provided by the RSPCA (2012). On sample receipt, each sample was logged onto a Laboratory Information Management System (LIMS) and given a unique Laboratory Sample Number (LSN). Each LSN can be traced back to the Sampling Information form of the collected samples. On arrival at the laboratory, all samples were frozen (below -18°C), until further preparation.

2.3 Sample preparation

The processed products were analysed as purchased whereas the brown crabmeat from the 19 samples of live crabs (which were previously humanely killed) was analysed raw (i.e. not cooked) to avoid introduction of any further cross contamination.

The aim was to prepare at least 60 g of the edible portion to produce four sub-samples of at least 15g. Where an individual sample size was smaller than 60 g (e.g. brown crabmeat from a small live

crab), several individual samples were bulked to form a composite sample to ensure that the minimum weight could be obtained. This was clearly recorded.

Each sub-sample was given a unique number based on the LSN with the following nomenclature:

Sub-sample 01: primary sample to be analysed for the purpose of the survey

Sub-sample 02: confirmatory sub-sample

Sub-sample 03: brand-owner sub-sample

Sub-sample 04: to be archived for one year should results be contested.

The primary objective of the work was to analyse cadmium in brown crabmeat and products containing brown crabmeat. For category 1 products (whole crab), the brown crabmeat was manually separated from the whole sample, either including all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012) (50 samples) or just the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a) (67 samples). The brown crabmeat component was subsequently homogenised and analysed. Processed crab products (i.e., dressed crabs, crab pâté, crab spreads/pastes, crab soup) contain a mixture of brown crabmeat and other ingredients. Such products were prepared by homogenising the entire sample before analyses. Additionally, the sex, weight and size of the whole crab were also recorded during the sample preparation stage.

2.4 Sample analysis

The brown crabmeat and brown crabmeat products underwent an acid digestion using an enclosed vessel microwave (Multiwave 3000, Anton Paar, Hertford, UK). Typically, approximately 3 g of homogenised sample was weighed out and pre-digested overnight in 6mL of nitric acid (Aristar grade 69%, VWR, Leicestershire, UK). The digestion was performed using a temperature-controlled microwave programme specific for the sample matrix. The digest was then further diluted prior to analysis by inductively coupled plasma-Mass Spectrometry (ICP-MS) using an Agilent 7500ce (Agilent Technologies, Waldbronn, Germany). Quantification of Cd was performed by external calibration and deploying eight levels (0, 0.5, 1, 5, 10, 20, 100 and 500 μ g/L) of working standard solutions which were prepared from a customised mixed metal standard solution of 100mg/L (SPEX Certiprep Ltd, Middlesex, UK).

A reagent blank and a certified reference material (CRM TORT-2-Lobster hepatopancreas, National Research Council Canada, Halifax, Nova Scotia, Canada) were included with every batch of 14 samples. Concentration data derived from the analysis of the CRM were then added to existing

quality control Shewhart charts (using North West Analytical Quality Analyst™, Northwest Analytical Inc., USA) for the assessment of the on-going method performance and validity of Cd concentration data from the batch analysis of real sample. The validity of results was established using the warning and control limits of the Shewhart chart, which are defined as 2σ and 3σ respectively.

Random duplicate analyses of 10% of the collected samples were also carried out to further assess the precision of the method. The relative difference (d_r) between the two duplicate samples (X_1 , X_2) was determined as described in equation 1, and assessed against a quality performance criterion with a PASS/FAIL decision of (d_r) $>20\%$ for a FAIL.

$$(d_r) = \frac{X_1 - X_2}{(X_1 + X_2) \times 0.5} \times 100 \quad \text{Equation 1}$$

The analytical method applied at Cefas is accredited to ISO/IEC 17025: 2005 by the United Kingdom Accreditation Service (UKAS) for samples of categories 1 and 2. For samples classed under categories 3-5, the scope of accreditation did not cover matrices such as crab products, and a three level spiking procedure (low, medium and high levels of Cd) was applied to validate the new matrices. Six replicates were digested and analysed for each level of fortification:

1. Low level: at 20% of the top calibration standard (i.e. 100 µg[Cd]/L)
2. Medium level: at 50% of the top calibration standard (i.e. 250 µg[Cd]/L)
3. High level: at 80% of the top calibration standard (i.e. 400µg[Cd]/L).

Results from the Cd spiking procedure provided information on the performance of the entire method from sample preparation and analysis throughout the duration of the work. Percentage recovery (accuracy), intra- and inter-batch precision as represented by percentage relative standard deviations (%RSD) were determined. Values of intra-batch precisions were obtained from the six replicates at each spiking level and inter-batch precision was derived from the combined precision values obtained from each spiking level.

3 Results

3.1 Sampling survey

The sampling survey was broken down into several distinct manageable field trips. Generally, fishmongers were the main suppliers for category 1 (whole crabs) and category 2 (dressed crabs) samples, whereas supermarkets and small retailers tended to supply products from categories 3, 4 and 5. Additionally, because crab landing is seasonal, the availability of category 1 samples was reduced due to bad weather at the end of the crab season. The shortfall in category 1 was therefore

made up by either purchasing products in the vicinity (i.e. within 15 miles radius) of the randomly selected sampling settlements, or by using online retailers.

For the reasons above, the framework provided in Table 3 could not be strictly applied for the type of retailer, however, the distribution in sample categories was respected and the sample numbers collected within each UK constituent country was representative of UK populations as per Table 1.

A summary of the sampling survey is tabulated in Tables 4 and 5 and further information with regards to sample description is provided in Appendix 1.

Table 4: Sample numbers collected per category within each constituent country with indicative numbers

Category	England	Scotland	Northern Ireland	Wales	Total
1	169	18	5	11	203
2	51	4	3	2	60
3	52	4	2	3	61
4	51	4	1	3	59
5	13	2	0	1	16
<i>Total</i>	<i>336</i>	<i>32</i>	<i>11</i>	<i>20</i>	<i>399</i>

Table 5: Sample numbers collected per category and retailer type

Category	Supermarket	Small retail market	Fishmonger	Online
1	13	0	83	107
2	17	0	36	7
3	61	0	0	0
4	55	0	1	3
5	8	2	0	6
<i>Total</i>	<i>154</i>	<i>2</i>	<i>120</i>	<i>123</i>

Initially, each retailer was given the relevant Food Standards Agency letter with a covering letter introducing Cefas as representatives of the Agency as sample collectors, including contact details for reply should questions or objections arise at the time of sample purchase. Due to the reluctance of some retailers, this letter was subsequently given after the purchase of the product with the agreement of the FSA. Notification letters or e-mails of product purchase were also sent to the manufacturers for acknowledgement.

3.2 Sample preparation

For samples of categories 2-5, the targeted minimum sample weight (i.e. 60 g) was achieved from either a single sample or by multi-sample bulking. However, for the whole crab sample category, it

was more difficult to extract a sufficient amount of brown meat from an individual sample. Thus, the majority of samples from this category were bulked from two individual whole crabs forming a composite sample to ensure that the minimum weight was obtained. Nevertheless, some bulked samples provided less than four sub-samples as targeted due to their small size. Overall, two samples of whole crabs (LSN 2012/2023 and 2012/3254) only had very small amount of brown meat that could be extracted for analysis. Therefore, although 399 samples were collected, results are reported for 397 samples. The information on sex, weight and size of the whole crab is summarised in Appendix2.

3.3 Spiking experiment and internal quality assurance and control

The following samples were used to carry out the spiking experiment:

Category 3: Crab spread (LSN 2012/01978)

Category 4: Crab pâté (LSN 2012/01952)

Category 5: Crab bisque (LSN 2012/02026)

The method performance characteristics for Cd from the spiking experiments are summarised in Table 6. Acceptable Cd recoveries, in compliance with our validated method performance criteria, were observed in each of the three product categories at low, medium and high spiking concentration levels of the analyte. From the Cd fortification exercises, mean recoveries ranged from 96 to 110%. Overall, intra-batch precision values ranged from <1 to 15.3 %. Although satisfactory, the analysis of the category 5 product showed the highest variation (12.5 to 15.3%). The inter-batch precision of the method was also acceptable and ranged from 7.4 to 12.4%.

Table 6: Method performance characteristics for the determination of Cd crab spread (category 3), pâté (category 4) and crab bisque (category 5)

Performance characteristic	Crab product category		
	3	4	5
Mean recovery (%) [low level spike]	100	99	103
Mean recovery (%) [medium level spike]	109	96	107
Mean recovery (%) [high level spike]	110	105	100
Intra-batch precision for no spike level (%RSD)	4.1	0.9	4.9
Intra-batch precision for low level (%RSD)	7.6	4.9	15.3
Intra-batch precision for medium level (%RSD)	7.8	10.9	14.2
Intra-batch precision for high level (%RSD)	9.1	13.2	12.5
Inter-batch precision (%RSD)	7.4	8.9	12.4

The mean recovery of Cd from the extraction and analysis of certified reference material (CRM Tort-2, certified Cd value of 26.7mg/kg) was 94.0% ($n=63$; RSD of 4.1%). The inter-batch variations of Cd concentrations from the CRM are presented in Figure 2.

The Cd concentrations from the duplicate analysis of 10% of the collected samples are tabulated in Appendix 3, and no duplicate sample failed the performance criterion. The method limit of detection and limit of quantification for Cd is 8 µg/kg and 27 µg/kg respectively.

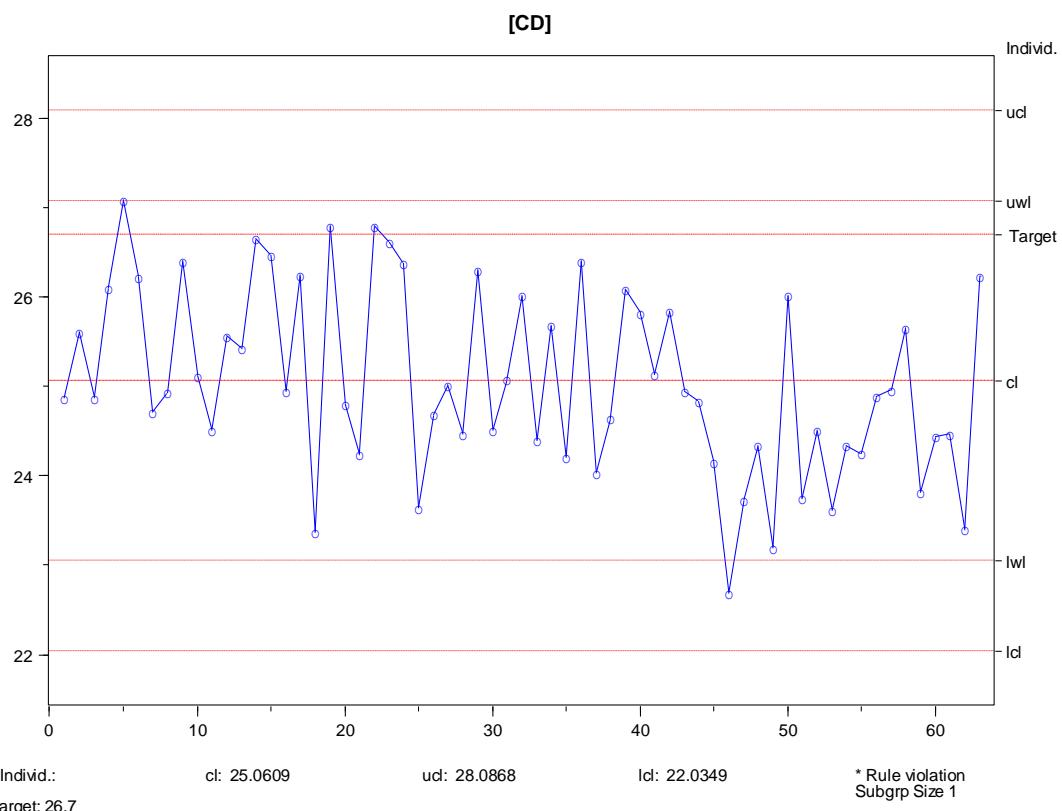


Figure 2: Shewhart Chart showing the inter-batch variation of determined Cd from the TORT-2 (Lobster hepatopancreas) certified reference material. Where: Target = certified value in mg/kg; cl = control limit (average of all CRM results for Cd); lwl/uwl = lower/upper warning limit (defined as ± 2 standard deviations); lcl/ucl = lower/upper control limit (defined as ± 3 standard deviations).

The uncertainty associated with the certified value of the cadmium content of the Tort-2 CRM is reported as a mass fraction, i.e. 0.6mg/kg (National Research Council Canada, 1994). Within this present study, the expanded uncertainty obtained for Tort-2 (defined here as $2 \times \%RSD$ derived from the Cd Shewhart control chart) is also expressed as a mass fraction of 2.1mg/kg. Unfortunately, the approach used for quantifying the measurement uncertainty provided on the Tort-2 certificate of analysis dating from 1994 is not defined. Also, it is most likely that the determination of uncertainty would have been different to the more contemporary methodology applied to derive the expanded

uncertainty as performed in this study. Thus, a comparison between the two values of uncertainty cannot be undertaken.

3.4 Cadmium levels in brown crabmeat and brown crabmeat food products

A comprehensive list of all cadmium wet weight (w.w.) concentrations (including a sample description and Cefas sample number) is given in Appendix 4. The expanded uncertainty Cd concentrations (mg/kg w.w.) expressed as $2 \times \%RSD$ derived from the Cd Shewhart control chart as shown in Figure 2 are also reported. Concentrations ranged from 0.01 mg/kg (sample category 4, crab pâté with lemon) to 26 mg/kg (sample category 1, brown meat extracted from whole cooked crab). An overview of the concentrations classified by sample category is provided in Table 7 and includes values for the median, mean and range for each category.

Table 7: Summary of mean, median and range of Cd concentrations [mg/kg, wet weight (w.w.)] calculated for each brown crabmeat category

Sample category	Number of samples	Mean (mg/kg w.w.)	Median (mg/kg w.w.)	Range (mg/kg w.w.)
1	201	3.9	3.3	0.11 – 26
2	60	1.9	1.6	0.15 – 4.8
3	61	2.4	2.6	0.31 – 5.8
4	59	4.0	3.6	0.01 – 9
5	16	3.6	3	0.05 – 7.6

In addition to Cd, other trace and heavy metals (arsenic, chromium, copper, iron, lead, manganese, mercury, nickel, selenium and zinc) were determined and individual concentration data are presented in Appendix 5. The summary statistics for all metals are tabulated in Table 8. The mean and median concentrations for lead and mercury were 0.06; 0.05 mg/kg w.w., and 0.07; 0.06 mg/kg w.w. respectively.

Table 8: Summary of mean, median and range of all trace metals concentrations [mg/kg, wet weight (w.w.)] calculated for all samples

Analyte	Mean (mg/kg w.w.)	Median (mg/kg w.w.)	Range (mg/kg w.w.)
As	9.81	9.3	0.35-29
Cd	3.36	2.8	0.01-26
Cr	0.11	0.07	0.01-0.96
Cu	23.7	19	1.1-127
Fe	24.2	22	1.7-236
Hg	0.07	0.06	0.01-0.21
Mn	4.02	3.2	0.2-22
Ni	0.17	0.11	0.02-0.86
Pb	0.06	0.05	0.01-3
Se	1.16	1.1	0.11-2.9
Zn	32.0	30	2.5-103

4 Conclusions

A sampling plan representative of brown crabmeat and brown crabmeat food products on sale throughout the whole of the UK was designed around product categories and delivered successfully. A robust, fully validated analytical method was used for the analysis of Cd in the samples collected and this report provides reliable, quality assured evidence with regards to levels of Cd in 397 brown crabmeat and brown crabmeat food products.

The analytical data presented has provided contemporary information on levels of Cd in brown crabmeat and brown crabmeat products that are currently available to the UK consumer. It is proposed that such information will be made available by the UK's FSA to the European Food Safety Authority. The outcome of this survey will assist the FSA to refine its assessment of safety risk to human health.

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7 Appendices

- Appendix 1 Sample category and description
- Appendix 2 Sex, weight and size measurements on whole crab samples.
- Appendix 3 Concentration of Cd (mg/kg w.w.) in different brown crabmeat categories as determined from duplicate samples.
- Appendix 4 Cadmium concentrations [mg/kg wet weight (w.w.)] in brown crabmeat and brown crabmeat products sourced from UK retail outlets.
- Appendix 5 Trace and heavy metal concentrations (mg/kg w.w.) including cadmium in brown crabmeat and brown crabmeat products sourced from UK retail outlets.

Appendix 1. Sample category and description

Laboratory Sample Number	Category	Sample description	Sample quantity/packing condition	Type of Retailer
2012/02036	1	Cornish brown meat	1 x 100g tub	Supermarket
2012/02037	1	Cornish brown meat	1 x 100g tub	Supermarket
2012/02038	1	Cornish brown meat	1 x 100g tub	Supermarket
2012/02039	1	Cornish brown meat	1 x 100g tub	Supermarket
2012/02040	1	Cornish brown meat	1 x 100g tub	Supermarket
2012/02041	1	Cornish brown meat	1 x 100g tub	Supermarket
2012/02042	1	Cornish brown meat	1 x 100g tub	Supermarket
2012/02043	1	Cornish brown meat	1 x 100g tub	Supermarket
2012/02047	2	Hebridean 4 mini dressed crabs	1 x 130g pack	Supermarket
2012/02044	2	Cornish Fifty Fifty Crab	2 x 100 tub	Supermarket
2012/02048	3	Crab spread	3x 35g jars	Supermarket
2012/02049	3	Crab spread	3x 35g jars	Supermarket
2012/02050	3	Crab spread	3x 35g jars	Supermarket
2012/02051	4	Hebridean crab terrine with creme fraiche	2 x 100g pack	Supermarket
2012/02052	4	Crab pâté	3 x 90g tin	Supermarket
2012/02053	4	Crab pâté	3 x 90g tin	Supermarket
2012/02054	4	Hebridean crab terrine with creme fraiche	1 x 100g pack	Supermarket
2012/01966	1	1 very large brown crab (only 2 sub-samples)	1 x cooked crab	Fishmonger
2012/01965	1	1 very large brown crab (only 2 sub-samples)	1 x cooked crab	Fishmonger
2012/01964	1	Whole Blue swimming crabs (only 1 sub-sample)	3 x uncooked crabs	Fishmonger
2012/01963	1	Whole Blue swimming crabs (only 1 sub-sample)	4 x uncooked crabs	Fishmonger
2012/01962	1	Whole Blue swimming crabs (only 1 sub-sample)	3 x uncooked crabs	Fishmonger
2012/01961	1	Whole brown crab	2 x cooked crab	Fishmonger
2012/01960	1	Whole brown crab (only 1 sub-sample)	2 x cooked crab	Fishmonger
2012/01954	1	Whole spider crab (only 1 sub-sample)	1 x cooked crab	Fishmonger
2012/01957	1	Whole Blue swimming crabs (only 1 sub-sample)	3 x uncooked crabs	Fishmonger
2012/01958	1	Whole Blue swimming crabs	4 x uncooked crabs	Fishmonger
2012/01959	1	Whole brown crab	2 x cooked crab	Fishmonger
2012/01967	1	Fresh brown meat	2 x small pot	Fishmonger
2012/01968	1	Fresh brown meat	2 x small pot	Fishmonger
2012/01955	1	brown meat	2 x pots	Fishmonger
2012/01956	1	brown meat	2 x pots	Fishmonger
2012/01972	2	Cornish Fifty Fifty crab	3 x 100g	Supermarket
2012/01974	2	Cornish Fifty Fifty crab	3 x 100g	Supermarket
2012/01973	1	Cornish Brown crab	1 x 100g pots	Supermarket
2012/01970	2	Dressed crab	2 x crabs	Fishmonger
2012/01971	2	Dressed crab	2 x crabs	Fishmonger
2012/01975	3	Crab Spread	3 x 75g jars	Supermarket
2012/01978	3	Crab Spread	3 x 75g jars	Supermarket
2012/01976	3	Crab paste	4 x 75g jars	Supermarket
2012/01977	3	Crab paste	4 x 75 jar	Supermarket
2012/01979	3	Crab Spread	4 x 75g jars	Supermarket
2012/01982	4	Crab pâté	3 x 90g tin	Supermarket
2012/01984	4	Hebridean Crab Pâté Blended with Mayonnaise	2 x 113g pot	Supermarket

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Laboratory Sample Number	Category	Sample description	Sample quantity/packing condition	Type of Retailer
2012/01983	4	Hebridean Crab Pâté Blended with Mayonnaise	2 x 113g pot	Supermarket
2012/01981	4	Hebridean Crab Pâté Blended with Mayonnaise	1 x 113g pot	Supermarket
2012/01980	4	Hebridean Crab Pâté Blended with Mayonnaise	2 x 113g pot	Supermarket
2012/01985	4	Luxury Orkney crab terrine	3 x 113g pot	Supermarket
2012/01986	5	Tinned dressed crab	4 x 43g tin	Supermarket
2012/01987	5	Tinned crab pâté	3 x 90g tin	Supermarket
2012/03226	2	Hebridean 4 mini dressed crabs	1 x pack	Supermarket
2012/02964	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02965	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02966	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02967	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02968	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02969	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02970	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02971	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02972	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02973	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02974	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02975	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02976	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02977	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02978	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02979	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02980	2	Dressed crab	1 x crab	Fishmonger
2012/02981	2	Dressed crab	1 x crab	Fishmonger
2012/02982	2	Dressed crab	1 x crab	Fishmonger
2012/02983	2	Dressed crab	1 x crab	Fishmonger
2012/02934	3	Crab Spread	2 x 75g jar	Supermarket
2012/02935	3	Crab Spread	2 x 75g jar	Supermarket
2012/02940	4	Luxury Orkney Crab Terrine	2 x 113g pot	Supermarket
2012/02941	4	Luxury Orkney Crab Terrine	2 x 113g pot	Supermarket
2012/02942	4	Luxury Orkney Crab Terrine	2 x 113g pot	Supermarket
2012/02943	4	Luxury Orkney Crab Terrine	2 x 113g pot	Supermarket
2012/02944	4	Luxury Orkney Crab Terrine	2 x 113g pot	Supermarket
2012/02945	4	Luxury Orkney Crab Terrine	2 x 113g pot	Supermarket
2012/02946	4	Luxury Orkney Crab Terrine	2 x 113g pot	Supermarket
2012/02947	4	Luxury Orkney Crab Terrine	2 x 113g pot	Supermarket
2012/01900	2	Dressed crab	1 x crab	Fishmonger
2012/01901	2	Dressed crab	1 x crab	Fishmonger
2012/01904	5	Tinned dressed crabs	2 x 43g tin	Supermarket
2012/01899	5	Tinned dressed crabs	2 x 43g tin	Supermarket
2012/01903	5	Tinned dressed crabs	2 x 43g tin	Supermarket
2012/01902	5	Tinned dressed crabs	2 x 43g tin	Supermarket
2012/02126	1	Brown crab meat	1 x 454g pack	Fishmonger
2012/02127	1	Brown crab meat	1 x 454g pack	Fishmonger
2012/02128	1	Brown crab meat	1 x 454g pack	Fishmonger
2012/02129	1	Brown crab meat	1 x 454g pack	Fishmonger
2012/02134	1	Brown crab meat	1 x pot	Supermarket
2012/02135	1	Brown crab meat	1 x pot	Supermarket
2012/02122	2	Dressed crab	1x crab	Fishmonger
2012/02123	2	Dressed crab	1x crab	Fishmonger
2012/02124	2	Dressed crab	1x crab	Fishmonger

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Laboratory Sample Number	Category	Sample description	Sample quantity/packing condition	Type of Retailer
2012/02125	2	Dressed crab	1x crab	Fishmonger
2012/02130	2	Dressed layered crab	1 x tub	Supermarket
2012/02136	2	Cornish Fifty Fifty Crab	2 x pots	Supermarket
2012/02137	2	Cornish Fifty Fifty Crab	2 x pots	Supermarket
2012/02138	2	Cornish Fifty Fifty Crab	3 x pots	Supermarket
2012/02132	3	Crab Spread	4 x 43g jars	Supermarket
2012/02133	4	Crab Pâté	4 x 90g tins	Supermarket
2012/02948	5	Tinned minced crab with spices	2 x 160g tins	Small retailer
2012/02949	5	Tinned minced crab with spices	2 x 160g tins	Small retailer
2012/02987	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02988	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02989	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02990	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02991	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02992	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02993	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02994	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02995	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02996	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02997	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02998	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02999	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/03000	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02984	2	Dressed crab	1 x crab	Fishmonger
2012/02985	2	Dressed crab	1 x crab	Fishmonger
2012/02986	2	Dressed crab	1 x crab	Fishmonger
2012/02950	3	Crab Spread	2 x 75g jar	Supermarket
2012/02951	3	Crab Spread	2 x 75g jar	Supermarket
2012/02954	3	Crab Spread	2 x 75g jar	Supermarket
2012/02955	3	Crab Spread	2 x 75g jar	Supermarket
2012/01938	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/01939	2	Dressed crab	2 x crab	Fishmonger
2012/01940	2	Dressed crab	2 x crab	Fishmonger
2012/01944	3	Crab Spread	3 x 75g jar	Supermarket
2012/01945	3	Crab Spread	3 x 75g jar	Supermarket
2012/01946	3	Crab Spread	3 x 35g jar	Supermarket
2012/01947	3	Crab Spread	3 x 35g jar	Supermarket
2012/01948	3	Crab Spread	3 x 35g jar	Supermarket
2012/01952	4	Scottish Orkney crab pâté	3 x 115g tub	Supermarket
2012/01951	4	Scottish Orkney crab pâté	3 x 115g tub	Supermarket
2012/01949	4	Luxury Orkney Crab Terrine	3 x 113g pot	Supermarket
2012/01950	4	Luxury Orkney Crab Terrine	3 x 113g pot	Supermarket
2012/01953	5	Tinned dressed crab	4 x 43g tin	Supermarket
2012/03047	2	Dressed crab	1 x crab	Supermarket
2012/03041	3	Crab Spread	2 x 75g jar	Supermarket
2012/03042	3	Crab Spread	2 x 75g jar	Supermarket
2012/03057	3	Crab Spread	2 x 75g jar	Supermarket
2012/03058	3	Crab Spread	2 x 75g jar	Supermarket
2012/03060	4	Scottish Orkney crab Pâté	1 x 113g tub	Supermarket
2012/03061	4	Scottish Orkney crab Pâté	1 x 113g tub	Supermarket
2012/03062	4	Scottish Orkney crab Pâté	1 x 113g tub	Supermarket
2012/03063	4	Scottish Orkney crab Pâté	1 x 113g tub	Supermarket
2012/03043	4	Luxury Orkney Crab Terrine	1 x 113g pot	Supermarket
2012/03044	4	Luxury Orkney Crab Terrine	1 x 113g pot	Supermarket

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Laboratory Sample Number	Category	Sample description	Sample quantity/packing condition	Type of Retailer
2012/03045	4	Luxury Orkney Crab Terrine	1 x 113g pot	Supermarket
2012/03046	4	Luxury Orkney Crab Terrine	1 x 113g pot	Supermarket
2012/03048	4	Crab Pâté	1 x 115g tub	Supermarket
2012/03049	4	Crab Pâté	1 x 115g tub	Supermarket
2012/03050	4	Crab Pâté	1 x 115g tub	Supermarket
2012/03051	4	Crab Pâté	1 x 115g tub	Supermarket
2012/03053	4	Hebridean Crab Pâté Blended with Mayonnaise	1 x 113g tub	Supermarket
2012/03054	4	Hebridean Crab Pâté Blended with Mayonnaise	1 x 113g tub	Supermarket
2012/03055	4	Hebridean Crab Pâté Blended with Mayonnaise	1 x 113g tub	Supermarket
2012/03056	4	Hebridean Crab Pâté Blended with Mayonnaise	1 x 113g tub	Supermarket
2012/03164	1	Whole brown crab	2 x uncooked crabs	Fishmonger
2012/03165	1	Whole brown crab	2 x uncooked crabs	Fishmonger
2012/03166	1	Whole brown crab	2 x uncooked crabs	Fishmonger
2012/03167	1	Whole brown crab	2 x uncooked crabs	Fishmonger
2012/03168	1	Whole brown crab	2 x uncooked crabs	Fishmonger
2012/03169	1	Whole brown crab	2 x uncooked crabs	Fishmonger
2012/03170	1	Whole brown crab	2 x uncooked crabs	Fishmonger
2012/03157	1	Whole brown crab	2 x cooked whole crabs	Fishmonger
2012/03158	1	Whole brown crab	2 x cooked whole crabs	Fishmonger
2012/03159	1	Whole brown crab	2 x cooked whole crabs	Fishmonger
2012/03160	1	Whole brown crab	2 x cooked whole crabs	Fishmonger
2012/03161	1	Whole brown crab	2 x cooked whole crabs	Fishmonger
2012/03162	1	Whole brown crab	2 x cooked whole crabs	Fishmonger
2012/03163	1	Whole brown crab	2 x cooked whole crabs	Fishmonger
2012/03151	2	Dressed crab	1 crab	Fishmonger
2012/03152	2	Dressed crab	1 crab	Fishmonger
2012/03153	2	Dressed crab	1 crab	Fishmonger
2012/03154	2	Dressed crab	1 crab	Fishmonger
2012/03155	2	Dressed crab	1 crab	Fishmonger
2012/03156	2	Dressed crab	1 crab	Fishmonger
2012/03174	1	Devon Brown crab meat	1 x 455g tub	Fishmonger
2012/03175	1	Devon Brown crab meat	1 x 455g tub	Fishmonger
2012/03176	1	Devon Brown crab meat	1 x 455g tub	Fishmonger
2012/03177	1	Devon Brown crab meat	1 x 455g tub	Fishmonger
2012/03171	2	Dressed Devon Crab	1 crab	Fishmonger
2012/03172	2	Dressed Devon Crab	1 crab	Fishmonger
2012/03173	2	Dressed Devon Crab	1 crab	Fishmonger
2012/03149	2	Dressed layered crab	1 x pack	Supermarket
2012/03150	2	Hebridean Mini Dressed crabs	1 packs of 4	Supermarket
2012/03144	2	Cornish Fifty Fifty Crab	1x 100g tub	Supermarket
2012/03141	3	Crab Spread	1 x 75g jar	Supermarket
2012/03142	3	Crab Spread	1 x 75g jar	Supermarket
2012/03143	3	Crab Spread	1 x 75g jar	Supermarket
2012/03140	3	Crab Spread	4 x 35g jars	Supermarket
2012/03145	4	Hebridean Crab Pâté Blended with Mayonnaise	1x 113 tub	Supermarket
2012/03148	4	Hebridean crab terrine with creme fraiche	100g	Supermarket
2012/03146	4	Potted crab	2x 57g tubs	Supermarket
2012/03147	4	Potted crab	2x 57g tubs	Supermarket
2012/03202	3	Crab Spread	2 x 75g jar	Supermarket
2012/03203	3	Crab Spread	2 x 75g jar	Supermarket
2012/03204	3	Crab Spread	2 x 75g jar	Supermarket

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Laboratory Sample Number	Category	Sample description	Sample quantity/packing condition	Type of Retailer
2012/03205	3	Crab Spread	2 x 75g jar	Supermarket
2012/03206	3	Crab Spread	2 x 75g jar	Supermarket
2012/03207	3	Crab Spread	2 x 75g jar	Supermarket
2012/03208	3	Crab Spread	2 x 75g jar	Supermarket
2012/03209	3	Crab Spread	2 x 75g jar	Supermarket
2012/03210	3	Crab Spread	2 x 75g jar	Supermarket
2012/03211	3	Crab Spread	4 x 75g jar	Supermarket
2012/03212	3	Crab Spread	2 x 75g jar	Supermarket
2012/03213	3	Crab Spread	4 x 75g jar	Supermarket
2012/03214	3	Crab Spread	4 x 75g jar	Supermarket
2012/03215	3	Crab Spread	4 x 75g jar	Supermarket
2012/03216	3	Crab Spread	4 x 75g jar	Supermarket
2012/03217	3	Crab Spread	4 x 75g jar	Supermarket
2012/03218	3	Crab Spread	2 x 75g jar	Supermarket
2012/03219	3	Crab Spread	2 x 75g jar	Supermarket
2012/03220	3	Crab Spread	2 x 75g jar	Supermarket
2012/03221	3	Crab Spread	2 x 75g jar	Supermarket
2012/03222	3	Crab Spread	2 x 75g jar	Supermarket
2012/03223	3	Crab Spread	2 x 75g jar	Supermarket
2012/03224	3	Crab Spread	2 x 75g jar	Supermarket
2012/03225	3	Crab Spread	2 x 75g jar	Supermarket
2012/03227	2	Dressed crab	1 x crab	Online
2012/01870	1	Dressed crab	2 x cooked crab	Online
2012/02023	1	Whole soft shell crab (no sample)	1 x uncooked crab	Online
2012/02019	1	Whole brown crab	2 x cooked crabs	Online
2012/02020	1	Whole brown crab	2 x cooked crabs	Online
2012/02021	1	Whole spider crab (only 1 sub-sample)	1 x cooked crab	Online
2012/02022	1	Whole spider crab (only 2 sub-samples)	1 x cooked crab	Online
2012/02116	1	Whole jumbo soft crab (Mangrove crab)	2 x uncooked crab	Online
2012/02119	1	Whole soft shell crab (Mangrove crab)	4 x uncooked crab	Online
2012/02120	1	Whole soft shell crab (Mangrove crab)	4 x uncooked crab	Online
2012/02121	1	Whole soft shell crab (Mangrove crab)	4 x uncooked crab	Online
2012/01915	1	Whole brown crab	2 x cooked crabs	Online
2012/01804	1	Whole brown crab	2 x cooked crabs	Online
2012/01814	1	Whole brown crab	2 x cooked crabs	Online
2012/01885	1	Brown crab meat	1 x 1227g pack	Online
2012/02016	1	Brown crab meat	1 x 100g pack	Online
2012/02017	1	Brown crab meat	1 x 500g bag	Online
2012/02018	1	Brown crab meat	1 x 500g bag	Online
2012/01802	1	Brown crab meat	1 x 500g bag	Online
2012/01805	1	Brown crab meat	1 x 500g bag	Online
2012/01815	1	Brown crab meat	1 x 500g bag	Online
2012/01865	1	Brown crab meat	1 x 454g bag	Online
2012/01869	1	Brown crab meat	1 x 100g pack	Online
2012/01884	2	Dressed crab	2 x crab	Online
2012/02025	2	Dressed crab	1 x crab	Online
2012/01803	2	Dressed crab	2 x crab	Online
2012/01813	2	Dressed crab	2 x crab	Online
2012/01867	2	Dressed crab	4 x crab	Online
2012/01886	4	Potted crab	4 x 240g pot	Online
2012/01866	4	Crab pâté	1 x 125g pack	Online
2012/01868	4	Crab pâté	1 x 100g pack	Online
2012/02026	5	Crab bisque	2 x tins	Online
2012/02027	5	Crab Soup	1 x jar	Online

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Laboratory Sample Number	Category	Sample description	Sample quantity/packing condition	Type of Retailer
2012/02028	5	Crab Soup	1 x jar	Online
2012/02029	5	Crab Soup	1 x jar	Online
2012/02117	5	Crab cake	2 x crab cake	Online
2012/02118	5	Korean Crab combined meat (snow crab meat)	1 x 400g bag	Online
2012/02240	1	Whole Brown crab	2 x cooked crabs	Fishmonger
2012/02241	1	Whole Brown crab	2 x cooked crabs	Fishmonger
2012/02249	1	Whole Brown crab	2 x cooked crabs	Fishmonger
2012/02250	1	Whole Brown crab	2 x cooked crabs	Fishmonger
2012/02242	1	Brown meat	1 tub	Fishmonger
2012/02243	2	Dressed crab	2 x crabs	Fishmonger
2012/02244	2	Dressed crab	2 x crabs	Fishmonger
2012/02109	3	Crab paste	4 x 75g jar	Supermarket
2012/02112	4	Scottish Orkney crab pâté	2 x 115g tub	Supermarket
2012/02103	5	Tinned dressed crab	4 x 43g tin	Supermarket
2012/02475	3	Crab flavoured paste	4x 75g jars	Supermarket
2012/02471	4	Orkney Crab pâté	3 x 100g pots	Supermarket
2012/02478	5	Tinned dressed crab	4 x 43g tin	Supermarket
2012/02466	1	Whole brown crab	2 x uncooked crabs	Fishmonger
2012/02467	1	Whole brown crab	2 x uncooked crabs	Fishmonger
2012/02461	2	4 mini dressed Orkney crabs	1 x pack	Supermarket
2012/02462	2	4 mini dressed Orkney crabs	1 x pack	Supermarket
2012/02458	3	Crab Spread	4 x 35g jar	Supermarket
2012/02470	4	Crab pâté with lemon	2 x 185g jars	Fishmonger
2012/02460	4	Luxury Orkney Crab Terrine	3 x 113g pot	Supermarket
2012/02239	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/02107	3	Crab Spread	2 x 75g jars	Supermarket
2012/03506	2	Dressed crabs	1 x crab	Fishmonger
2012/03507	2	Dressed crabs	1 x crab	Fishmonger
2012/03013	3	Crab spread	2 x 75g jars	Supermarket
2012/03008	4	Crab Terrine	1 x 113g pot	Supermarket
2012/03508	2	Dressed crabs	1 x crab	Fishmonger
2012/03020	3	Crab spread	2 x 75g jars	Supermarket
2012/03077	1	Brown meat	1 x 100g pack	Fishmonger
2012/03075	1	Brown meat	1 x 100g pack	Fishmonger
2012/03076	1	Brown meat	1 x 100g pack	Fishmonger
2012/03067	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/03068	1	Whole brown crab	2 x cooked crabs	Fishmonger
2012/03073	2	Orkney Mini dressed crabs	1 pack of 4	Supermarket
2012/03074	2	Orkney Mini dressed crabs	1 pack of 4	Supermarket
2012/03069	4	Scottish Orkney Crab Pâté	1 x 115g tub	Supermarket
2012/03115	3	Crab spread	2 x 75g jars	Supermarket
2012/03116	3	Crab spread	1 x 75g jars	Supermarket
2012/03117	1	Whole brown crabs	2 x cooked crabs	Fishmonger
2012/03118	1	Whole brown crabs	2 x cooked crabs	Fishmonger
2012/03119	4	Scottish Orkney Crab Pâté	2 x 115g tubs	Supermarket
2012/03123	1	Whole brown crab	2 x cooked crabs	Supermarket
2012/03124	1	Whole brown crab	2 x cooked crabs	Supermarket
2012/03128	4	Crab and Prawn terrine	1 x 140g pack	Supermarket
2012/03129	3	Crab spread	2 x 75g jars	Supermarket
2012/03231	1	Pasteurised Brown meat	1 x 227g pack	Online
2012/03232	1	Pasteurised Brown meat	1 x 227g pack	Online
2012/03233	1	Pasteurised Brown meat	1 x 227g pack	Online
2012/03234	1	Pasteurised Brown meat	1 x 227g pack	Online

APPENDIX 1

Laboratory Sample Number	Category	Sample description	Sample quantity/packing condition	Type of Retailer
2012/03235	1	Pasteurised Brown meat	1 x 227g pack	Online
2012/03236	1	Pasteurised Brown meat	1 x 227g pack	Online
2012/03237	1	Pasteurised Brown meat	1 x 227g pack	Online
2012/03238	1	Pasteurised Brown meat	1 x 227g pack	Online
2012/03239	1	Pasteurised Brown meat	1 x 227g pack	Online
2012/03240	1	Pasteurised Brown meat	1 x 227g pack	Online
2012/03241	1	Brown Meat	1 x 445g pack	Online
2012/03242	1	Brown Meat	1 x 445g pack	Online
2012/03243	1	Brown Meat	1 x 445g pack	Online
2012/03244	1	Brown Meat	1 x 445g pack	Online
2012/03245	1	Brown Meat	1 x 445g pack	Online
2012/03246	1	Brown Meat	1 x 445g pack	Online
2012/03247	1	Brown Meat	1 x 445g pack	Online
2012/03248	1	Brown Meat	1 x 445g pack	Online
2012/03249	1	Brown Meat	1 x 445g pack	Online
2012/03250	1	Brown Meat	1 x 445g pack	Online
2012/03251	1	Whole brown crab	2 x cooked crabs	Online
2012/03252	1	Whole brown crab	2 x cooked crabs	Online
2012/03253	1	Whole brown crab	2 x cooked crabs	Online
2012/03254	1	Whole brown crab (no sample)	2 x cooked crabs	Online
2012/03255	1	Whole brown crab	2 x cooked crabs	Online
2012/03256	1	Whole brown crab	2 x cooked crabs	Online
2012/03257	1	Whole brown crab	2 x cooked crabs	Online
2012/03258	1	Whole brown crab	2 x cooked crabs	Online
2012/03259	1	Whole brown crab	2 x cooked crabs	Online
2012/03260	1	Whole brown crab	2 x cooked crabs	Online
2012/03261	1	Brown meat	1 x 500g bag	Online
2012/03262	1	Brown meat	1 x 500g bag	Online
2012/03263	1	Brown meat	1 x 500g bag	Online
2012/03264	1	Brown meat	1 x 500g bag	Online
2012/03265	1	Brown meat	1 x 500g bag	Online
2012/03266	1	Brown meat	1 x 500g bag	Online
2012/03267	1	Brown meat	1 x 500g bag	Online
2012/03268	1	Brown meat	1 x 500g bag	Online
2012/03269	1	Brown meat	1 x 500g bag	Online
2012/03270	1	Brown meat	1 x 500g bag	Online
2012/03281	1	Brown Meat	1x 200g tub	Online
2012/03282	1	Brown Meat	1x 200g tub	Online
2012/03283	1	Brown Meat	1x 200g tub	Online
2012/03284	1	Brown Meat	1x 200g tub	Online
2012/03285	1	Brown Meat	1x 200g tub	Online
2012/03286	1	Brown Meat	1x 200g tub	Online
2012/03287	1	Brown Meat	1x 200g tub	Online
2012/03288	1	Brown Meat	1x 200g tub	Online
2012/03289	1	Brown Meat	1x 200g tub	Online
2012/03290	1	Brown Meat	1x 200g tub	Online
2012/03291	1	Whole brown crab	2 x cooked crabs	Online
2012/03292	1	Whole brown crab	2 x cooked crabs	Online
2012/03293	1	Whole brown crab	2 x cooked crabs	Online
2012/03294	1	Whole brown crab	2 x cooked crabs	Online
2012/03295	1	Whole brown crab	2 x cooked crabs	Online
2012/03296	1	Whole brown crab	2 x cooked crabs	Online
2012/03321	2	Dressed crab	1 x 1 crab	Fishmonger
2012/03322	2	Dressed crab	1 x 1 crab	Fishmonger

APPENDIX 1

Laboratory Sample Number	Category	Sample description	Sample quantity/packing condition	Type of Retailer
2012/03323	2	Dressed crab	1 x 1 crab	Fishmonger
2012/03324	2	Dressed crab	1 x 1 crab	Fishmonger
2012/03325	2	Dressed crab	1 x 1 crab	Fishmonger
2012/03326	4	Crab pâté	1 x 90g tin	Supermarket
2012/03327	4	Crab pâté	1 x 90g tin	Supermarket
2012/03328	4	Crab pâté	1 x 90g tin	Supermarket
2012/03329	4	Crab pâté	1 x 90g tin	Supermarket
2012/03330	1	Whole brown crab	2 x cooked crab	Online
2012/03331	1	Whole brown crab	2 x cooked crab	Online
2012/03332	1	Whole brown crab	2 x cooked crab	Online
2012/03333	1	Whole brown crab	2 x cooked crab	Online
2012/03334	1	Whole brown crab	2 x cooked crab	Online
2012/03335	1	Whole brown crab	2 x cooked crab	Online
2012/03336	1	Whole brown crab	2 x cooked crab	Online
2012/03337	1	Whole brown crab	2 x cooked crab	Online
2012/03338	1	Whole brown crab	2 x cooked crab	Online
2012/03339	1	Whole brown crab	2 x cooked crab	Online
2012/03340	1	Whole brown crab	2 x cooked crab	Online
2012/03341	1	Whole brown crab	2 x cooked crab	Online
2012/03342	1	Whole brown crab	2 x cooked crab	Online
2012/03343	1	Whole brown crab	2 x cooked crab	Online
2012/03344	1	Whole brown crab	2 x cooked crab	Online
2012/03417	1	Whole brown crab	2 x cooked crab	Online
2012/03418	1	Whole brown crab	2 x cooked crab	Online
2012/03419	1	Whole brown crab	2 x cooked crab	Online
2012/03420	1	Whole brown crab	2 x cooked crab	Online
2012/03421	1	Whole brown crab	2 x cooked crab	Online
2012/03422	1	Brown Meat	1 x 500g bag	Online
2012/03423	1	Brown Meat	1 x 500g bag	Online
2012/03424	1	Brown Meat	1 x 500g bag	Online
2012/03425	1	Brown Meat	1 x 500g bag	Online
2012/03426	1	Brown Meat	1 x 500g bag	Online
2012/03427	1	Brown Meat	1 x 500g bag	Online
2012/03428	1	Brown Meat	1 x 500g bag	Online
2012/03429	1	Brown Meat	1 x 500g bag	Online
2012/03430	1	Brown Meat	1 x 500g bag	Online
2012/03431	1	Brown Meat	1 x 500g bag	Online

APPENDIX 1

Appendix 2. Sex, weight and size measurements on whole crab samples.

Laboratory Sample Number	Sample description	Sample Quantity/ packing condition	Sex 1	Weight 1 (g)	Size 1 (cm)	Sex 2	Weight 2 (g)	Size 2 (cm)	Sex 3	Weight 3 (g)	Size 3 (cm)	Sex 4	Weight 4 (g)	Size 4 (cm)	Combined weight of brown crabmeat (g)	Additional comments
2012/01804**	Whole brown crab	2 x cooked crabs	M	1110.1	19.5	M	824.1	17.9	n/a	n/a	n/a	n/a	n/a	n/a	64.502	4 sub-samples
2012/01814**	Whole brown crab	2 x crab	M	955.4	17.8	M	953.2	17	n/a	n/a	n/a	n/a	n/a	n/a	102.242	4 sub-samples
2012/01915*	Whole brown crab	2 x cooked crabs	M	687.2	15.7	F	826.1	17.8	n/a	n/a	n/a	n/a	n/a	n/a	79.142	4 sub-samples
2012/01938*	Whole brown crab	2 x cooked crabs	M	574.9	16.1	M	736.9	16	n/a	n/a	n/a	n/a	n/a	n/a	44.312	2 sub-samples only
2012/01954**	Whole spider crab	1 x cooked crab	M	1341.5	15	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	13.483	1 sub-sample only
2012/01957**	Whole Blue swimming crabs	3 x uncooked crabs	F	173.3	13.5	F	182.4	15.5	F	195.7	14.6	n/a	n/a	n/a	15.001	1 sub-sample only
2012/01958**	Whole Blue swimming crabs	4 x uncooked crabs	M	158.8	13.5	F	189.9	13.5	F	182.9	13	F	204	15	49.138	2 sub-samples only
2012/01959*	Whole brown crab	2 x cooked crab	M	681.3	17	F	501.51	15.5	n/a	n/a	n/a	n/a	n/a	n/a	74.716	4 sub-samples
2012/01960**	Whole brown crab	2 x cooked crab	F	n/a as shell removed	n/a as shell removed	F	n/a as shell removed	n/a as shell removed	n/a	n/a	n/a	n/a	n/a	n/a	19.585	1 sub-sample only
2012/01961*	Whole brown crab	2 x cooked crab	M	681	16.5	F	429	15.5	n/a	n/a	n/a	n/a	n/a	n/a	76.293	4 sub-samples
2012/01962**	Whole Blue swimming crabs	3 x uncooked crabs	M	119.5	12.6	F	132.5	12.8	M	181.9	13.7	n/a	n/a	n/a	7.886	1 sub-sample only
2012/01963**	Whole Blue swimming crabs	4 x uncooked crabs	M	166.6	13.5	M	134.9	12.6	M	137.2	12.2	M	160.3	13.5	15.93	1 sub-sample only
2012/01964**	Whole Blue swimming crabs	3 x uncooked crabs	F	181.2	14.2	M	173.3	13	M	133.4	12	n/a	n/a	n/a	18.689	1 sub-sample only
2012/01965**	1 very large brown crab	1 x cooked crab	M	1421.2	20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	42.541	2 sub-samples only

Key: n/a= not available; n/r = not recorded; * brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 2

Laboratory Sample Number	Sample description	Sample Quantity/ packing condition	Sex 1	Weight 1 (g)	Size 1 (cm)	Sex 2	Weight 2 (g)	Size 2 (cm)	Sex 3	Weight 3 (g)	Size 3 (cm)	Sex 4	Weight 4 (g)	Size 4 (cm)	Combined weight of brown crabmeat (g)	Additional comments
2012/01966**	1 very large brown crab	1 x cooked crab	M	1889.7	21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	43.838	2 sub-samples only
2012/02019*	Whole brown crab	2 x cooked crabs	M	929.9	18.5	F	727.5	19.5	n/a	n/a	n/a	n/a	n/a	n/a	83.249	4 sub-samples
2012/02020*	Whole brown crab	2 x cooked crabs	F	960.7	20.9	M	1127.8	18.5	n/a	n/a	n/a	n/a	n/a	n/a	92.166	4 sub-samples
2012/02021*	Whole spider crab	1 x cooked crab	M	1043.9	18.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	27.097	1 sub-sample only
2012/02022*	Whole spider crab	1 x cooked crab	M	1109	19.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	33.569	2 sub-samples only
2012/02023**	Whole soft shell crab	1 x uncooked crab	n/r	n/r	n/r	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	no sample	4 sub-samples
2012/02116**	Whole jumbo soft crab (Mangrove crab)	2 x uncooked crab	n/r	n/r	n/r	n/r	n/r	n/r	n/a	n/a	n/a	n/a	n/a	n/a	38.997	2 sub-samples only
2012/02119**	Whole soft shell crab (Mangrove crab)	4 x uncooked crab	n/r	n/r	n/r	54.275	3 sub-samples only									
2012/02120**	Whole soft shell crab (Mangrove crab)	4 x uncooked crab	n/r	n/r	n/r	48.822	2 sub-samples only									
2012/02121**	Whole soft shell crab (Mangrove crab)	4 x uncooked crab	n/r	n/r	n/r	56.728	3 sub-samples only									
2012/02239**	Whole brown crab	2 x cooked crabs	F	719.3	17.5	F	684.5	16.7	n/a	n/a	n/a	n/a	n/a	n/a	213.063	4 sub-samples
2012/02240*	Whole Brown crab	2 x cooked crabs	M	639.3	16	M	493.9	14.5	n/a	n/a	n/a	n/a	n/a	n/a	54.927	3 sub-samples only
2012/02241*	Whole Brown crab	2 x cooked crabs	M	489.3	14	F	565.2	16.5	n/a	n/a	n/a	n/a	n/a	n/a	47.5	2 sub-samples only

Key: n/a= not available; n/r = not recorded; * brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 2

Laboratory Sample Number	Sample description	Sample Quantity/ packing condition	Sex 1	Weight 1 (g)	Size 1 (cm)	Sex 2	Weight 2 (g)	Size 2 (cm)	Sex 3	Weight 3 (g)	Size 3 (cm)	Sex 4	Weight 4 (g)	Size 4 (cm)	Combined weight of brown crabmeat (g)	Additional comments
2012/02249**	Whole Brown crab	2 x cooked crabs	F	613.3	17	F	716.5	17.5	n/a	n/a	n/a	n/a	n/a	n/a	70.402	4 sub-samples
2012/02250*	Whole Brown crab	2 x cooked crabs	F	661.7	19.3	M	634.1	15.8	n/a	n/a	n/a	n/a	n/a	n/a	89.29	4 sub-samples
2012/02466**	Whole brown crab	2 x uncooked crabs	M	850	17	M	620.7	16	n/a	n/a	n/a	n/a	n/a	n/a	69.07	4 sub-samples
2012/02467**	Whole brown crab	2 x uncooked crabs	M	781.3	16.6	M	737.9	16.4	n/a	n/a	n/a	n/a	n/a	n/a	69.87	4 sub-samples
2012/02964*	Whole brown crab	2 x cooked crabs	M	685	16.9	M	458.1	16.7	n/a	n/a	n/a	n/a	n/a	n/a	76.03	4 sub-samples
2012/02965*	Whole brown crab	2 x cooked crabs	M	611.1	16	M	1005.9	16.7	n/a	n/a	n/a	n/a	n/a	n/a	73.269	4 sub-samples
2012/02966*	Whole brown crab	2 x cooked crabs	M	626.6	16	M	756.3	16.5	n/a	n/a	n/a	n/a	n/a	n/a	107.43	4 sub-samples
2012/02967*	Whole brown crab	2 x cooked crabs	M	415.9	14	M	657.8	15.5	n/a	n/a	n/a	n/a	n/a	n/a	67.694	4 sub-samples
2012/02968*	Whole brown crab	2 x cooked crabs	M	759.3	16.4	M	503	15.4	n/a	n/a	n/a	n/a	n/a	n/a	83.14	4 sub-samples
2012/02969*	Whole brown crab	2 x cooked crabs	M	600	15	M	786.2	16.2	n/a	n/a	n/a	n/a	n/a	n/a	86.684	4 sub-samples
2012/02970*	Whole brown crab	2 x cooked crabs	M	718.7	17	M	580.1	16	n/a	n/a	n/a	n/a	n/a	n/a	103	4 sub-samples
2012/02971*	Whole brown crab	2 x cooked crabs	M	781.4	16.3	M	708.4	16	n/a	n/a	n/a	n/a	n/a	n/a	74.572	4 sub-samples
2012/02972*	Whole brown crab	2 x cooked crabs	M	593.2	16	M	696.9	165.5	n/a	n/a	n/a	n/a	n/a	n/a	51.972	4 sub-samples
2012/02973*	Whole brown crab	2 x cooked crabs	M	705.5	17.7	M	927.6	17	n/a	n/a	n/a	n/a	n/a	n/a	87.7	4 sub-samples
2012/02974*	Whole brown crab	2 x cooked crabs	M	562.1	15	M	908.9	16.7	n/a	n/a	n/a	n/a	n/a	n/a	104.235	4 sub-samples
2012/02975*	Whole brown crab	2 x cooked crabs	M	703.2	17	M	940.9	18	n/a	n/a	n/a	n/a	n/a	n/a	74.67	4 sub-samples
2012/02976*	Whole brown crab	2 x cooked crabs	M	959.1	17	M	818.5	16.5	n/a	n/a	n/a	n/a	n/a	n/a	82.048	4 sub-samples
2012/02977*	Whole brown crab	2 x cooked crabs	M	842.2	17.5	M	714.6	16.5	n/a	n/a	n/a	n/a	n/a	n/a	75.5	4 sub-samples

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APPENDIX 2

Laboratory Sample Number	Sample description	Sample Quantity/ packing condition	Sex 1	Weight 1 (g)	Size 1 (cm)	Sex 2	Weight 2 (g)	Size 2 (cm)	Sex 3	Weight 3 (g)	Size 3 (cm)	Sex 4	Weight 4 (g)	Size 4 (cm)	Combined weight of brown crabmeat (g)	Additional comments
2012/02978*	Whole brown crab	2 x cooked crabs	M	729.7	16.4	M	865.6	17	n/a	n/a	n/a	n/a	n/a	n/a	64.561	4 sub-samples
2012/02979*	Whole brown crab	2 x cooked crabs	M	724.6	17	M	770.9	17.1	n/a	n/a	n/a	n/a	n/a	n/a	74.57	4 sub-samples
2012/02987*	Whole brown crab	2 x cooked crabs	F	317.7	14.2	F	355.7	14.2	n/a	n/a	n/a	n/a	n/a	n/a	58.284	4 sub-samples
2012/02988*	Whole brown crab	2 x cooked crabs	F	327.9	13.3	F	456.9	14.5	n/a	n/a	n/a	n/a	n/a	n/a	75.248	4 sub-samples
2012/02989*	Whole brown crab	2 x cooked crabs	F	443.6	15.9	F	410.2	15	n/a	n/a	n/a	n/a	n/a	n/a	90.07	4 sub-samples
2012/02990**	Whole brown crab	2 x cooked crabs	F	282.2	13	F	494.1	15	n/a	n/a	n/a	n/a	n/a	n/a	62.661	4 sub-samples
2012/02991**	Whole brown crab	2 x cooked crabs	F	444.2	15	F	372.6	14	n/a	n/a	n/a	n/a	n/a	n/a	58.978	4 sub-samples
2012/02992**	Whole brown crab	2 x cooked crabs	F	352.1	14	F	345.9	13.5	n/a	n/a	n/a	n/a	n/a	n/a	52.914	4 sub-samples
2012/02993*	Whole brown crab	2 x cooked crabs	F	350.2	14.7	F	384.6	15	n/a	n/a	n/a	n/a	n/a	n/a	88.87	4 sub-samples
2012/02994**	Whole brown crab	2 x cooked crabs	F	368.6	13.5	F	393.9	14	n/a	n/a	n/a	n/a	n/a	n/a	70.942	4 sub-samples
2012/02995**	Whole brown crab	2 x cooked crabs	F	412.5	14.5	F	369.6	13.4	n/a	n/a	n/a	n/a	n/a	n/a	77.323	4 sub-samples
2012/02996*	Whole brown crab	2 x cooked crabs	F	362.2	14.6	F	347.6	15	n/a	n/a	n/a	n/a	n/a	n/a	74.56	4 sub-samples
2012/02997**	Whole brown crab	2 x cooked crabs	F	353.2	14	F	376.6	13.5	n/a	n/a	n/a	n/a	n/a	n/a	68.586	4 sub-samples
2012/02998**	Whole brown crab	2 x cooked crabs	F	418.1	14.5	F	365	14	n/a	n/a	n/a	n/a	n/a	n/a	61.653	4 sub-samples
2012/02999*	Whole brown crab	2 x cooked crabs	F	402.1	15.5	F	444.4	16	n/a	n/a	n/a	n/a	n/a	n/a	116.18	4 sub-samples
2012/03000**	Whole brown crab	2 x cooked crabs	F	429.9	15.5	F	374.9	14	n/a	n/a	n/a	n/a	n/a	n/a	73.398	4 sub-samples
2012/03067*	Whole brown crab	2 x cooked crabs	M	888	18.9	M	950.3	18.5	n/a	n/a	n/a	n/a	n/a	n/a	63.98	4 sub-samples
2012/03068*	Whole brown crab	2 x cooked crabs	M	780	18.2	M	769.5	17.8	n/a	n/a	n/a	n/a	n/a	n/a	121.075	4 sub-samples
2012/03117*	Whole brown crabs	2 x cooked crabs	F	464.9	16.6	F	676.7	18.4	n/a	n/a	n/a	n/a	n/a	n/a	78.13	4 sub-samples

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APPENDIX 2

Laboratory Sample Number	Sample description	Sample Quantity/ packing condition	Sex 1	Weight 1 (g)	Size 1 (cm)	Sex 2	Weight 2 (g)	Size 2 (cm)	Sex 3	Weight 3 (g)	Size 3 (cm)	Sex 4	Weight 4 (g)	Size 4 (cm)	Combined weight of brown crabmeat (g)	Additional comments
2012/03118*	Whole brown crabs	2 x cooked crabs	F	524.3	16.7	F	1036.8	20.5	n/a	n/a	n/a	n/a	n/a	n/a	100.77	4 sub-samples
2012/03123*	Whole brown crab	2 x cooked crabs	F	492	16.5	F	585.6	17	n/a	n/a	n/a	n/a	n/a	n/a	88.02	4 sub-samples
2012/03124*	Whole brown crab	2 x cooked crabs	F	645.9	17.5	F	546.2	15.8	n/a	n/a	n/a	n/a	n/a	n/a	40.266	4 sub-samples
2012/03157*	Whole brown crab	2 x cooked whole crabs	F	523.21	16.6	F	601.6	17	n/a	n/a	n/a	n/a	n/a	n/a	71.68	4 sub-samples
2012/03158*	Whole brown crab	2 x cooked whole crabs	F	506.3	14.5	F	566.3	16	n/a	n/a	n/a	n/a	n/a	n/a	71.088	4 sub-samples
2012/03159*	Whole brown crab	2 x cooked whole crabs	F	509.3	16	F	395.8	14.2	n/a	n/a	n/a	n/a	n/a	n/a	92.07	4 sub-samples
2012/03160*	Whole brown crab	2 x cooked whole crabs	F	444.4	13.5	F	452.1	14	n/a	n/a	n/a	n/a	n/a	n/a	75.409	4 sub-samples
2012/03161*	Whole brown crab	2 x cooked whole crabs	F	655.9	15.5	F	525.8	15	n/a	n/a	n/a	n/a	n/a	n/a	95.961	4 sub-samples
2012/03162*	Whole brown crab	2 x cooked whole crabs	M	558.4	15	F	444.6	14.1	n/a	n/a	n/a	n/a	n/a	n/a	104.87	4 sub-samples
2012/03163*	Whole brown crab	2 x cooked whole crabs	M	558.8	15.5	F	548	17.2	n/a	n/a	n/a	n/a	n/a	n/a	60.54	4 sub-samples
2012/03164**	Whole brown crab	2 x uncooked crabs	M	791.4	18	M	1002.9	17.7	n/a	n/a	n/a	n/a	n/a	n/a	81.233	4 sub-samples
2012/03165**	Whole brown crab	2 x uncooked crabs	M	976.1	18	M	836.9	16.9	n/a	n/a	n/a	n/a	n/a	n/a	75.163	4 sub-samples
2012/03166**	Whole brown crab	2 x uncooked crabs	M	957.2	17.5	M	1045.5	18.5	n/a	n/a	n/a	n/a	n/a	n/a	71.314	4 sub-samples
2012/03167**	Whole brown crab	2 x uncooked crabs	M	824.6	17.4	M	894.3	17	n/a	n/a	n/a	n/a	n/a	n/a	79.03	4 sub-samples
2012/03168**	Whole brown crab	2 x uncooked crabs	M	805.8	17	M	1019.9	17.7	n/a	n/a	n/a	n/a	n/a	n/a	93.471	4 sub-samples
2012/03169**	Whole brown crab	2 x uncooked crabs	M	967.5	18	M	992	17.9	n/a	n/a	n/a	n/a	n/a	n/a	80.307	4 sub-samples
2012/03170**	Whole brown crab	2 x uncooked crabs	M	916.4	16.8	M	878.3	16.9	n/a	n/a	n/a	n/a	n/a	n/a	67.598	4 sub-samples

Key: n/a = not available; n/r = not recorded; * brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 2

Laboratory Sample Number	Sample description	Sample Quantity/ packing condition	Sex 1	Weight 1 (g)	Size 1 (cm)	Sex 2	Weight 2 (g)	Size 2 (cm)	Sex 3	Weight 3 (g)	Size 3 (cm)	Sex 4	Weight 4 (g)	Size 4 (cm)	Combined weight of brown crabmeat (g)	Additional comments
2012/03251*	Whole brown crab	2 x crab	F	899.4	20	F	548.6	17	n/a	n/a	n/a	n/a	n/a	n/a	58.19	4 sub-samples
2012/03252**	Whole brown crab	2 x crab	F	490	16	F	453	16	n/a	n/a	n/a	n/a	n/a	n/a	21.202	1 sub-sample only
2012/03253**	Whole brown crab	2 x crab	F	823.4	18.8	F	682.4	17	n/a	n/a	n/a	n/a	n/a	n/a	57.48	3 sub-samples only
2012/03254**	Whole brown crab	2 x crab	n/r	n/r	n/r	n/r	n/r	n/r	n/a	n/a	n/a	n/a	n/a	n/a	no sample	4 sub-samples
2012/03255**	Whole brown crab	2 x crab	F	533.6	15.5	F	705.3	16.2	n/a	n/a	n/a	n/a	n/a	n/a	35.708	1 sub-sample only
2012/03256*	Whole brown crab	2 x crab	F	615.9	17.3	F	598.2	17.4	n/a	n/a	n/a	n/a	n/a	n/a	48.16	3 sub-samples only
2012/03257**	Whole brown crab	2 x crab	M	912	17.03	F	582.9	15.5	n/a	n/a	n/a	n/a	n/a	n/a	66.257	4 sub-samples
2012/03258**	Whole brown crab	2 x crab	F	639.2	17	F	614.3	16.5	n/a	n/a	n/a	n/a	n/a	n/a	71.725	4 sub-samples
2012/03259*	Whole brown crab	2 x crab	F	566.7	16	F	622.7	17.2	n/a	n/a	n/a	n/a	n/a	n/a	75.01	4 sub-samples
2012/03260*	Whole brown crab	2 x crab	F	606.6	17.2	F	625.4	18	n/a	n/a	n/a	n/a	n/a	n/a	44.932	3 sub-samples only
2012/03291*	Whole brown crab	2 x crab	M	643.5	16	M	607.9	15.9	n/a	n/a	n/a	n/a	n/a	n/a	113.17	4 sub-samples
2012/03292*	Whole brown crab	2 x crab	M	645.5	14.8	M	628.9	15	n/a	n/a	n/a	n/a	n/a	n/a	90.858	4 sub-samples
2012/03293*	Whole brown crab	2 x crab	M	576.7	15	M	677.9	14.5	n/a	n/a	n/a	n/a	n/a	n/a	78.857	4 sub-samples
2012/03294*	Whole brown crab	2 x crab	M	559.3	14.5	M	643.7	15	n/a	n/a	n/a	n/a	n/a	n/a	75.057	4 sub-samples
2012/03295*	Whole brown crab	2 x crab	M	768	16.4	M	817.5	17.2	n/a	n/a	n/a	n/a	n/a	n/a	92.45	4 sub-samples
2012/03296*	Whole brown crab	2 x crab	M	777.6	15.5	M	650.5	14.5	n/a	n/a	n/a	n/a	n/a	n/a	81.288	4 sub-samples
2012/03330*	Whole brown crab	2 x cooked crab	F	712.4	16	F	388.6	13	n/a	n/a	n/a	n/a	n/a	n/a	49.873	3 sub-samples only

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APPENDIX 2

Laboratory Sample Number	Sample description	Sample Quantity/ packing condition	Sex 1	Weight 1 (g)	Size 1 (cm)	Sex 2	Weight 2 (g)	Size 2 (cm)	Sex 3	Weight 3 (g)	Size 3 (cm)	Sex 4	Weight 4 (g)	Size 4 (cm)	Combined weight of brown crabmeat (g)	Additional comments
2012/03331*	Whole brown crab	2 x cooked crab	F	460.7	17	F	457.9	14.6	n/a	n/a	n/a	n/a	n/a	48.79	4 sub-samples	
2012/03332*	Whole brown crab	2 x cooked crab	F	580.9	15	F	542.9	14	n/a	n/a	n/a	n/a	n/a	69.101	4 sub-samples	
2012/03333*	Whole brown crab	2 x cooked crab	F	580.7	16.8	F	435	15	n/a	n/a	n/a	n/a	n/a	54.26	4 sub-samples	
2012/03334*	Whole brown crab	2 x cooked crab	F	384.5	14.2	F	669.4	17.2	n/a	n/a	n/a	n/a	n/a	63.24	4 sub-samples	
2012/03335**	Whole brown crab	2 x cooked crab	M	411.4	13.5	F	634.1	16	n/a	n/a	n/a	n/a	n/a	86.467	4 sub-samples	
2012/03336*	Whole brown crab	2 x cooked crab	M	419.6	14.2	F	449.8	15.5	n/a	n/a	n/a	n/a	n/a	42.487	2 sub-samples only	
2012/03337**	Whole brown crab	2 x cooked crab	M	392.3	13.5	M	528.6	15.8	n/a	n/a	n/a	n/a	n/a	89.503	4 sub-samples	
2012/03338*	Whole brown crab	2 x cooked crab	F	631.8	17.5	M	507.4	15	n/a	n/a	n/a	n/a	n/a	68.85	4 sub-samples	
2012/03339**	Whole brown crab	2 x cooked crab	F	521	15.5	M	434.2	14	n/a	n/a	n/a	n/a	n/a	65.577	4 sub-samples	
2012/03340*	Whole brown crab	2 x cooked crab	M	680.3	16.6	M	492.1	14.7	n/a	n/a	n/a	n/a	n/a	123.68	4 sub-samples	
2012/03341**	Whole brown crab	2 x cooked crab	M	431.7	14.5	F	511.7	16	n/a	n/a	n/a	n/a	n/a	94.74	4 sub-samples	
2012/03342*	Whole brown crab	2 x cooked crab	F	585.9	16.3	F	443.5	15.6	n/a	n/a	n/a	n/a	n/a	67.24	4 sub-samples	
2012/03343**	Whole brown crab	2 x cooked crab	F	602.2	16	M	494.6	15	n/a	n/a	n/a	n/a	n/a	77.353	4 sub-samples	
2012/03344*	Whole brown crab	2 x cooked crab	F	635	17.3	F	412.7	14.6	n/a	n/a	n/a	n/a	n/a	84.69	4 sub-samples	
2012/03417**	Whole brown crab	2 x cooked crab	M	887.4	17.1	M	956.5	17.7	n/a	n/a	n/a	n/a	n/a	86.181	4 sub-samples	
2012/03418**	Whole brown crab	2 x cooked crab	M	1082.6	17.6	M	951.9	17.4	n/a	n/a	n/a	n/a	n/a	76.802	4 sub-samples	
2012/03419*	Whole brown crab	2 x cooked crab	M	862.31	16.8	M	1095.2	18.8	n/a	n/a	n/a	n/a	n/a	106.523	4 sub-samples	
2012/03420**	Whole brown crab	2 x cooked crab	M	978.2	17.7	M	987.4	17.8	n/a	n/a	n/a	n/a	n/a	70.838	4 sub-samples	
2012/03421**	Whole brown crab	2 x cooked crab	M	1087.5	18	M	797.7	16.1	n/a	n/a	n/a	n/a	n/a	77.988	4 sub-samples	

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APPENDIX 2

Appendix 3. Concentration of Cd (mg/kg w.w.) in different brown crabmeat categories as determined from duplicate samples.

Category	LSN	Sample Result	Duplicate Result	$(d)_r$ (in %)	Pass/Fail
5	2012/01801	0.01	0.01	0.0	PASS
1	2012/01869	1.6	1.8	11.8	PASS
3	2012/01948	1.4	1.7	19.4	PASS
2	2012/01974	3.2	3.2	0.0	PASS
4	2012/01951	5.8	6.2	6.7	PASS
2	2012/01961	2.0	1.8	10.5	PASS
3	2012/02045	7.1	7.1	0.0	PASS
2	2012/02055	0.12	0.11	8.7	PASS
2	2012/02107	1.9	1.6	17.1	PASS
2	2012/02112	5.5	5.9	7.0	PASS
2	2012/02136	4.1	4.3	4.8	PASS
1	2012/02129	3.8	3.9	2.6	PASS
2	2012/02244	0.94	1.1	15.7	PASS
5	2012/02948	0.05	0.05	0.0	PASS
1	2012/02971	3.2	2.9	9.8	PASS
1	2012/02976	3.3	3.0	9.5	PASS
1	2012/02995	3.2	3.2	0.0	PASS
3	2012/03042	2.8	2.8	0.0	PASS
2	2012/03047	4.8	5.2	8.0	PASS
1	2012/03075	4.8	5.1	6.1	PASS
4	2012/02470	0.01	0.01	0.0	PASS
4	2012/03128	2.1	2.3	9.1	PASS
3	2012/03141	2.8	2.7	3.6	PASS
1	2012/03167	4.6	4.5	2.2	PASS
2	2012/03173	0.37	0.38	2.7	PASS
3	2012/03206	2.5	2.5	0.0	PASS
1	2012/03238	4.1	4.9	17.8	PASS
1	2012/03258	4.6	4.3	6.7	PASS
1	2012/03266	4.3	4.4	2.3	PASS
1	2012/03246	3.3	3.5	5.9	PASS
1	2012/03341	2.8	2.8	0.0	PASS
1	2012/03296	1.4	1.4	0.0	PASS
1	2012/03282	1.9	2.0	5.1	PASS
1	2012/03418	4.0	4.2	4.9	PASS
1	2012/03431	1.8	1.8	0.0	PASS

APPENDIX 3

Appendix 4. Cadmium concentrations [mg/kg wet weight (w.w.)] in brown crabmeat and brown crabmeat products sourced from UK retail outlets.

Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/02036	Cornish brown meat	3.6	0.30
2012/02037	Cornish brown meat	3.6	0.30
2012/02038	Cornish brown meat	3.9	0.32
2012/02039	Cornish brown meat	3.8	0.31
2012/02040	Cornish brown meat	3.3	0.27
2012/02041	Cornish brown meat	4	0.33
2012/02042	Cornish brown meat	4.4	0.36
2012/02043	Cornish brown meat	4.2	0.35
2012/02047	Hebridean 4 mini dressed crabs	4.1	0.34
2012/02044	Cornish Fifty Fifty Crab	3.2	0.26
2012/02048	Crab spread	2.8	0.23
2012/02049	Crab spread	2	0.17
2012/02050	Crab spread	2	0.17
2012/02051	Hebridean crab terrine with creme fraiche	2.4	0.20
2012/02052	Crab pâté	0.31	0.03
2012/02053	Crab pâté	0.33	0.03
2012/02054	Hebridean crab terrine with creme fraiche	2.5	0.21
2012/01966**	1 very large brown crab (only 2 sub-samples)	16	1.32
2012/01965**	1 very large brown crab (only 2 sub-samples)	26	2.15
2012/01964**	Whole Blue swimming crabs (only 1 sub-sample)	4.6	0.38
2012/01963**	Whole Blue swimming crabs (only 1 sub-sample)	2.2	0.18
2012/01962**	Whole Blue swimming crabs (only 1 sub-sample)	2.7	0.22
2012/01961*	Whole brown crab	2	0.17
2012/01960**	Whole brown crab (only 1 sub-sample)	7.8	0.64
2012/01954**	Whole spider crab (only 1 sub-sample)	3.3	0.27
2012/01957**	Whole Blue swimming crabs (only 1 sub-sample)	3.8	0.31
2012/01958**	Whole Blue swimming crabs	2.8	0.23
2012/01959*	Whole brown crab	4.4	0.36

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/01967	Fresh brown meat	5.3	0.44
2012/01968	Fresh brown meat	4.7	0.39
2012/01955	brown meat	9.3	0.77
2012/01956	brown meat	9.8	0.81
2012/01972	Cornish Fifty Fifty crab	3	0.25
2012/01974	Cornish Fifty Fifty crab	3.2	0.26
2012/01973	Cornish Brown crab	4	0.33
2012/01970	Dressed crab	0.78	0.06
2012/01971	Dressed crab	0.86	0.07
2012/01975	Crab Spread	2.2	0.18
2012/01978	Crab Spread	2.2	0.18
2012/01976	Crab paste	1.1	0.09
2012/01977	Crab paste	0.34	0.03
2012/01979	Crab Spread	2.3	0.19
2012/01982	Crab pâté	0.31	0.03
2012/01984	Hebridean Crab Pâté Blended with Mayonnaise	8.8	0.73
2012/01983	Hebridean Crab Pâté Blended with Mayonnaise	8.9	0.74
2012/01981	Hebridean Crab Pâté Blended with Mayonnaise	9	0.74
2012/01980	Hebridean Crab Pâté Blended with Mayonnaise	8.3	0.69
2012/01985	Luxury Orkney crab terrine	3.6	0.30
2012/01986	Tinned dressed crab	7.3	0.60
2012/01987	Crab pâté	0.31	0.03
2012/03226	Hebridean 4 mini dressed crabs	2.6	0.21
2012/02964*	Whole brown crab	2.3	0.19
2012/02965*	Whole brown crab	1.7	0.14
2012/02966*	Whole brown crab	7	0.58
2012/02967*	Whole brown crab	1.4	0.12
2012/02968*	Whole brown crab	3.2	0.26
2012/02969*	Whole brown crab	1.8	0.15
2012/02970*	Whole brown crab	2.4	0.20
2012/02971*	Whole brown crab	3.2	0.26
2012/02972*	Whole brown crab	6.5	0.54
2012/02973*	Whole brown crab	5.8	0.48
2012/02974*	Whole brown crab	2.8	0.23
2012/02975*	Whole brown crab	4.8	0.40
2012/02976*	Whole brown crab	3.3	0.27
2012/02977*	Whole brown crab	2.2	0.18
2012/02978*	Whole brown crab	4.4	0.36

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 4

Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/02979*	Whole brown crab	3.1	0.26
2012/02980	Dressed crab	1.3	0.11
2012/02981	Dressed crab	1.3	0.11
2012/02982	Dressed crab	1.4	0.12
2012/02983	Dressed crab	1.2	0.10
2012/02934	Crab Spread	3.2	0.26
2012/02935	Crab Spread	3.3	0.27
2012/02940	Luxury Orkney Crab Terrine	2.9	0.24
2012/02941	Luxury Orkney Crab Terrine	2.8	0.23
2012/02942	Luxury Orkney Crab Terrine	2.7	0.22
2012/02943	Luxury Orkney Crab Terrine	2.7	0.22
2012/02944	Luxury Orkney Crab Terrine	2.6	0.21
2012/02945	Luxury Orkney Crab Terrine	3.3	0.27
2012/02946	Luxury Orkney Crab Terrine	3.2	0.26
2012/02947	Luxury Orkney Crab Terrine	3.8	0.31
2012/01900	Dressed crab	2.8	0.23
2012/01901	Dressed crab	2.9	0.24
2012/01904	Tinned dressed crabs	6.1	0.50
2012/01899	Tinned dressed crabs	6.6	0.55
2012/01903	Tinned dressed crabs	4.2	0.35
2012/01902	Tinned dressed crabs	6.4	0.53
2012/02126	Brown crab meat	3.7	0.31
2012/02127	Brown crab meat	3.9	0.32
2012/02128	Brown crab meat	3.8	0.31
2012/02129	Brown crab meat	3.8	0.31
2012/02134	Brown crab meat	4.6	0.38
2012/02135	Brown crab meat	4.6	0.38
2012/02122	Dressed crab	1.2	0.10
2012/02123	Dressed crab	1.7	0.14
2012/02124	Dressed crab	1.4	0.12
2012/02125	Dressed crab	1.6	0.13
2012/02130	Dressed layered crab	3	0.25
2012/02136	Cornish Fifty Fifty Crab	4.1	0.34
2012/02137	Cornish Fifty Fifty Crab	3.9	0.32
2012/02138	Cornish Fifty Fifty Crab	4	0.33
2012/02132	Crab Spread	2.1	0.17
2012/02133	Crab Pâté	0.35	0.03
2012/02948	Tinned minced crab with spices	0.05	0.00
2012/02949	Tinned minced crab with spices	0.05	0.00
2012/02987*	Whole brown crab	3.4	0.28

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APPENDIX 4

Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/02988*	Whole brown crab	2	0.17
2012/02989*	Whole brown crab	2.9	0.24
2012/02990**	Whole brown crab	1.6	0.13
2012/02991**	Whole brown crab	0.99	0.08
2012/02992**	Whole brown crab	3.3	0.27
2012/02993*	Whole brown crab	2	0.17
2012/02994**	Whole brown crab	3.7	0.31
2012/02995**	Whole brown crab	3.2	0.26
2012/02996*	Whole brown crab	3	0.25
2012/02997**	Whole brown crab	2.6	0.21
2012/02998**	Whole brown crab	2.7	0.22
2012/02999*	Whole brown crab	3.6	0.30
2012/03000**	Whole brown crab	1.9	0.16
2012/02984	Dressed crab	0.46	0.04
2012/02985	Dressed crab	0.55	0.05
2012/02986	Dressed crab	1.2	0.10
2012/02950	Crab Spread	3.3	0.27
2012/02951	Crab Spread	3.4	0.28
2012/02954	Crab Spread	1.7	0.14
2012/02955	Crab Spread	3.9	0.32
2012/01938*	Whole brown crab	1.4	0.12
2012/01939	Dressed crab	0.74	0.06
2012/01940	Dressed crab	0.61	0.05
2012/01944	Crab Spread	1.5	0.12
2012/01945	Crab Spread	1.5	0.12
2012/01946	Crab Spread	2.7	0.22
2012/01947	Crab Spread	2.9	0.24
2012/01948	Crab Spread	1.4	0.12
2012/01952	Scottish Orkney crab pâté	6.2	0.51
2012/01951	Scottish Orkney crab pâté	5.8	0.48
2012/01949	Luxury Orkney Crab Terrine	3.9	0.32
2012/01950	Luxury Orkney Crab Terrine	4.2	0.35
2012/01953	Tinned dressed crab	6.5	0.54
2012/03047	Dressed crab	4.8	0.40
2012/03041	Crab Spread	2.6	0.21
2012/03042	Crab Spread	2.8	0.23
2012/03057	Crab Spread	3.3	0.27
2012/03058	Crab Spread	3.8	0.31
2012/03060	Scottish Orkney crab Pâté	5.6	0.46
2012/03061	Scottish Orkney crab Pâté	5.4	0.45

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APPENDIX 4

Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/03062	Scottish Orkney crab Pâté	4.6	0.38
2012/03063	Scottish Orkney crab Pâté	5.6	0.46
2012/03043	Luxury Orkney Crab Terrine	3.4	0.28
2012/03044	Luxury Orkney Crab Terrine	2.8	0.23
2012/03045	Luxury Orkney Crab Terrine	3.5	0.29
2012/03046	Luxury Orkney Crab Terrine	3.5	0.29
2012/03048	Crab Pâté	6.2	0.51
2012/03049	Crab Pâté	5.1	0.42
2012/03050	Crab Pâté	5.1	0.42
2012/03051	Crab Pâté	5.8	0.48
2012/03053	Hebridean Crab Pâté Blended with Mayonnaise	8.2	0.68
2012/03054	Hebridean Crab Pâté Blended with Mayonnaise	8.9	0.74
2012/03055	Hebridean Crab Pâté Blended with Mayonnaise	8.3	0.69
2012/03056	Hebridean Crab Pâté Blended with Mayonnaise	8.6	0.71
2012/03164**	Whole brown crab	9.4	0.78
2012/03165**	Whole brown crab	8.9	0.74
2012/03166**	Whole brown crab	10	0.83
2012/03167**	Whole brown crab	4.6	0.38
2012/03168**	Whole brown crab	5	0.41
2012/03169**	Whole brown crab	0.43	0.04
2012/03170**	Whole brown crab	5	0.41
2012/03157*	Whole brown crab	1.8	0.15
2012/03158*	Whole brown crab	1.8	0.15
2012/03159*	Whole brown crab	2.4	0.20
2012/03160*	Whole brown crab	1.8	0.15
2012/03161*	Whole brown crab	2	0.17
2012/03162*	Whole brown crab	1.6	0.13
2012/03163*	Whole brown crab	1.3	0.11
2012/03151	Dressed crab	0.74	0.06
2012/03152	Dressed crab	1.4	0.12
2012/03153	Dressed crab	0.28	0.02
2012/03154	Dressed crab	0.59	0.05
2012/03155	Dressed crab	0.22	0.02
2012/03156	Dressed crab	0.45	0.04
2012/03174	Devon Brown crab meat	7.3	0.60
2012/03175	Devon Brown crab meat	4.6	0.38
2012/03176	Devon Brown crab meat	5.6	0.46

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

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Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/03177	Devon Brown crab meat	4.9	0.40
2012/03171	Dressed Devon Crab	3.3	0.27
2012/03172	Dressed Devon Crab	0.36	0.03
2012/03173	Dressed Devon Crab	0.37	0.03
2012/03149	Dressed layered crab	3	0.25
2012/03150	Hebridean Mini Dressed crabs	1.7	0.14
2012/03144	Cornish Fifty Fifty Crab	2.1	0.17
2012/03141	Crab Spread	2.8	0.23
2012/03142	Crab Spread	2.4	0.20
2012/03143	Crab Spread	2.6	0.21
2012/03140	Crab Spread	3.1	0.26
2012/03145	Hebridean Crab Pâté Blended with Mayonnaise	8.3	0.69
2012/03148	Hebridean crab terrine with creme fraiche	1.8	0.15
2012/03146	Potted crab	1.9	0.16
2012/03147	Potted crab	1.9	0.16
2012/03202	Crab Spread	3.7	0.31
2012/03203	Crab Spread	3.6	0.30
2012/03204	Crab Spread	2.5	0.21
2012/03205	Crab Spread	2.6	0.21
2012/03206	Crab Spread	2.5	0.21
2012/03207	Crab Spread	2.8	0.23
2012/03208	Crab Spread	3.5	0.29
2012/03209	Crab Spread	2.8	0.23
2012/03210	Crab Spread	4.3	0.36
2012/03211	Crab Spread	2.9	0.24
2012/03212	Crab Spread	2.8	0.23
2012/03213	Crab Spread	2	0.17
2012/03214	Crab Spread	3.2	0.26
2012/03215	Crab Spread	1.8	0.15
2012/03216	Crab Spread	2.8	0.23
2012/03217	Crab Spread	1.9	0.16
2012/03218	Crab Spread	3.4	0.28
2012/03219	Crab Spread	3.4	0.28
2012/03220	Crab Spread	3.3	0.27
2012/03221	Crab Spread	0.47	0.04
2012/03222	Crab Spread	0.45	0.04
2012/03223	Crab Spread	0.45	0.04
2012/03224	Crab Spread	0.48	0.04
2012/03225	Crab Spread	0.47	0.04

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)
** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

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Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/03227	Dressed crab	2	0.17
2012/01870	Dressed crab	1.2	0.10
2012/02023**	Whole soft shell crab (no sample)	no sample	no sample
2012/02019*	Whole brown crab	3	0.25
2012/02020*	Whole brown crab	6.7	0.55
2012/02021*	Whole spider crab (only 1 sub-sample)	4.7	0.39
2012/02022*	Whole spider crab (only 2 sub-samples)	2	0.17
2012/02116**	Whole jumbo soft crab (Mangrove crab)	0.11	0.01
2012/02119**	Whole soft shell crab (Mangrove crab)	0.26	0.02
2012/02120**	Whole soft shell crab (Mangrove crab)	0.25	0.02
2012/02121**	Whole soft shell crab (Mangrove crab)	0.23	0.02
2012/01915*	Whole brown crab	7.8	0.64
2012/01804**	Whole brown crab	3.5	0.29
2012/01814**	Whole brown crab	2.7	0.22
2012/01885	Brown crab meat	4.8	0.40
2012/02016	Brown crab meat	4.2	0.35
2012/02017	Brown crab meat	3.8	0.31
2012/02018	Brown crab meat	1.7	0.14
2012/01802	Brown crab meat	4.1	0.34
2012/01805	Brown crab meat	2.2	0.18
2012/01815	Brown crab meat	2.7	0.22
2012/01865	Brown crab meat	9.3	0.77
2012/01869	Brown crab meat	1.6	0.13
2012/01884	Dressed crab	3.6	0.30
2012/02025	Dressed crab	1.9	0.16
2012/01803	Dressed crab	1.8	0.15
2012/01813	Dressed crab	2	0.17
2012/01867	Dressed crab	0.6	0.05
2012/01886	Potted crab	3.1	0.26
2012/01866	Crab pâté	8.8	0.73
2012/01868	Crab pâté	0.34	0.03
2012/02026	Crab bisque	0.28	0.02
2012/02027	Crab Soup	1.8	0.15
2012/02028	Crab Soup	1.5	0.12
2012/02029	Crab Soup	1.8	0.15
2012/02117	Crab cake	0.08	0.01
2012/02118	Korean Crab combined meat (snow crab meat)	0.07	0.01
2012/02240*	Whole Brown crab	1.6	0.13
2012/02241*	Whole Brown crab	0.61	0.05

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)
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Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/02249*	Whole Brown crab	3.5	0.29
2012/02250**	Whole Brown crab	2.7	0.22
2012/02242	Brown meat	1.6	0.13
2012/02243	Dressed crab	0.99	0.08
2012/02244	Dressed crab	0.94	0.08
2012/02109	Crab paste	0.42	0.03
2012/02112	Scottish Orkney crab pâté	5.5	0.45
2012/02103	Tinned dressed crab	7.6	0.63
2012/02475	Crab flavoured paste	0.31	0.03
2012/02471	Orkney Crab pâté	4.7	0.39
2012/02478	Tinned dressed crab	6.5	0.54
2012/02466**	Whole brown crab	1.3	0.11
2012/02467**	Whole brown crab	0.74	0.06
2012/02461	4 mini dressed Orkney crabs	2.7	0.22
2012/02462	4 mini dressed Orkney crabs	2.8	0.23
2012/02458	Crab Spread	3.4	0.28
2012/02470	Crab pâté with lemon	0.01	0.00
2012/02460	Luxury Orkney Crab Terrine	3.6	0.30
2012/02239**	Whole brown crab	4.1	0.34
2012/02107	Crab Spread	1.9	0.16
2012/03506	Dressed crabs	4.5	0.37
2012/03507	Dressed crabs	4.6	0.38
2012/03013	Crab spread	2.6	0.21
2012/03008	Crab Terrine	4.3	0.36
2012/03508	Dressed crabs	4.1	0.34
2012/03020	Crab spread	1.7	0.14
2012/03077	Brown meat	4.4	0.36
2012/03075	Brown meat	4.8	0.40
2012/03076	Brown meat	4.5	0.37
2012/03067*	Whole brown crab	14	1.16
2012/03068*	Whole brown crab	10	0.83
2012/03073	Orkney Mini dressed crabs	2.6	0.21
2012/03074	Orkney Mini dressed crabs	2.6	0.21
2012/03069	Scottish Orkney Crab Pâté	4.8	0.40
2012/03115	Crab spread	2.6	0.21
2012/03116	Crab spread	2.6	0.21
2012/03117*	Whole brown crabs	4.7	0.39
2012/03118*	Whole brown crabs	3.3	0.27
2012/03119	Scottish Orkney Crab Pâté	3.7	0.31
2012/03123*	Whole brown crab	16	1.32

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

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Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/03124*	Whole brown crab	14	1.16
2012/03128	Crab and Prawn terrine	2.1	0.17
2012/03129	Crab spread	5.8	0.48
2012/03231	Pasteurised Brown meat	5.1	0.42
2012/03232	Pasteurised Brown meat	5.6	0.46
2012/03233	Pasteurised Brown meat	5.5	0.45
2012/03234	Pasteurised Brown meat	5.8	0.48
2012/03235	Pasteurised Brown meat	4.3	0.36
2012/03236	Pasteurised Brown meat	5.2	0.43
2012/03237	Pasteurised Brown meat	5.8	0.48
2012/03238	Pasteurised Brown meat	4.1	0.34
2012/03239	Pasteurised Brown meat	2.8	0.23
2012/03240	Pasteurised Brown meat	4.9	0.40
2012/03241	Brown Meat	5.1	0.42
2012/03242	Brown Meat	5.7	0.47
2012/03243	Brown Meat	3.5	0.29
2012/03244	Brown Meat	5.6	0.46
2012/03245	Brown Meat	5.5	0.45
2012/03246	Brown Meat	3.3	0.27
2012/03247	Brown Meat	5.6	0.46
2012/03248	Brown Meat	5.6	0.46
2012/03249	Brown Meat	4.4	0.36
2012/03250	Brown Meat	5.3	0.44
2012/03251*	Whole brown crab	7.1	0.59
2012/03252**	Whole brown crab	3.9	0.32
2012/03253**	Whole brown crab	6.2	0.51
2012/03254**	Whole brown crab (no sample)	no sample	no sample
2012/03255**	Whole brown crab	3.5	0.29
2012/03256*	Whole brown crab	4.2	0.35
2012/03257**	Whole brown crab	3.6	0.30
2012/03258**	Whole brown crab	4.6	0.38
2012/03259*	Whole brown crab	3.1	0.26
2012/03260*	Whole brown crab	2.8	0.23
2012/03261	Brown meat	3.3	0.27
2012/03262	Brown meat	8.3	0.69
2012/03263	Brown meat	4.2	0.35
2012/03264	Brown meat	2.8	0.23
2012/03265	Brown meat	3.4	0.28
2012/03266	Brown meat	4.3	0.36
2012/03267	Brown meat	3.3	0.27

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

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Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/03268	Brown meat	4.5	0.37
2012/03269	Brown meat	5.8	0.48
2012/03270	Brown meat	5.3	0.44
2012/03281	Brown Meat	1.8	0.15
2012/03282	Brown Meat	1.9	0.16
2012/03283	Brown Meat	1.6	0.13
2012/03284	Brown Meat	2	0.17
2012/03285	Brown Meat	1.7	0.14
2012/03286	Brown Meat	1.6	0.13
2012/03287	Brown Meat	1.6	0.13
2012/03288	Brown Meat	2	0.17
2012/03289	Brown Meat	1.5	0.12
2012/03290	Brown Meat	1.7	0.14
2012/03291*	Whole brown crab	2.4	0.20
2012/03292*	Whole brown crab	1.7	0.14
2012/03293*	Whole brown crab	2.1	0.17
2012/03294*	Whole brown crab	3.3	0.27
2012/03295*	Whole brown crab	1	0.08
2012/03296*	Whole brown crab	1.4	0.12
2012/03321	Dressed crab	0.54	0.04
2012/03322	Dressed crab	0.28	0.02
2012/03323	Dressed crab	0.66	0.05
2012/03324	Dressed crab	0.29	0.02
2012/03325	Dressed crab	0.15	0.01
2012/03326	Crab pâté	0.38	0.03
2012/03327	Crab pâté	0.34	0.03
2012/03328	Crab pâté	0.28	0.02
2012/03329	Crab pâté	0.34	0.03
2012/03330*	Whole brown crab	2.6	0.21
2012/03331*	Whole brown crab	1.6	0.13
2012/03332*	Whole brown crab	3.5	0.29
2012/03333*	Whole brown crab	1.3	0.11
2012/03334*	Whole brown crab	3	0.25
2012/03335**	Whole brown crab	2.5	0.21
2012/03336*	Whole brown crab	2.6	0.21
2012/03337**	Whole brown crab	1.9	0.16
2012/03338*	Whole brown crab	1.7	0.14
2012/03339**	Whole brown crab	3.6	0.30
2012/03340*	Whole brown crab	1.3	0.11
2012/03341**	Whole brown crab	2.8	0.23

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

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Laboratory Sample Number	Sample description	Cd concentration (mg/kg w.w.)	Expanded uncertainty (mg/kg w.w.)
2012/03342*	Whole brown crab	1.9	0.16
2012/03343**	Whole brown crab	1.7	0.14
2012/03344*	Whole brown crab	2.4	0.20
2012/03417**	Whole brown crab	5.9	0.49
2012/03418**	Whole brown crab	4	0.33
2012/03419*	Whole brown crab	2.5	0.21
2012/03420**	Whole brown crab	6.4	0.53
2012/03421**	Whole brown crab	3.9	0.32
2012/03422	Brown Meat	1.6	0.13
2012/03423	Brown Meat	1.7	0.14
2012/03424	Brown Meat	1.7	0.14
2012/03425	Brown Meat	1.7	0.14
2012/03426	Brown Meat	1.7	0.14
2012/03427	Brown Meat	1.6	0.13
2012/03428	Brown Meat	1.8	0.15
2012/03429	Brown Meat	1.6	0.13
2012/03430	Brown Meat	1.8	0.15
2012/03431	Brown Meat	1.8	0.15

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)
** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 4

Appendix 5. Trace and heavy metal concentrations (mg/kg w.w.) (including cadmium) in brown crabmeat and brown crabmeat products sourced from UK retail outlets.

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/02036	Cornish brown meat	0.05	0.11	42	31	12	3.6	0.03	1.4	2.5	17	0.05
2012/02037	Cornish brown meat	0.04	0.09	37	30	13	3.6	0.02	1.6	2.1	15	0.05
2012/02038	Cornish brown meat	0.04	0.09	35	29	13	3.9	0.02	1.3	2.4	15	0.06
2012/02039	Cornish brown meat	0.03	0.09	39	30	14	3.8	0.02	1.7	2.3	15	0.06
2012/02040	Cornish brown meat	0.02	0.08	31	28	12	3.3	0.02	1	2.1	14	0.05
2012/02041	Cornish brown meat	0.03	0.1	47	38	13	4	0.03	1.3	2.7	16	0.05
2012/02042	Cornish brown meat	0.03	0.1	38	35	16	4.4	0.03	1.7	2.7	16	0.06
2012/02043	Cornish brown meat	0.03	0.09	47	38	14	4.2	0.03	1.8	2.5	17	0.04
2012/02047	Hebridean 4 mini dressed crabs	0.05	0.07	9.8	38	4.9	4.1	0.01	0.67	0.97	10	0.06
2012/02044	Cornish Fifty Fifty Crab	0.04	0.07	27	33	14	3.2	0.02	1.3	2	14	0.05
2012/02048	Crab spread	0.16	0.41	15	25	8.6	2.8	0.03	1.1	3.7	24	0.04
2012/02049	Crab spread	0.2	0.42	15	24	7.9	2	0.02	0.84	3.6	23	0.04
2012/02050	Crab spread	0.19	0.41	15	24	8	2	0.04	1	3.6	24	0.04
2012/02051	Hebridean crab terrine with creme fraiche	0.11	0.09	7.5	23	4.9	2.4	<0.008	0.39	0.89	11	0.03
2012/02052	Crab pâté	0.1	0.13	3	18	3.7	0.31	<0.009	0.45	1.4	8.6	0.03
2012/02053	Crab pâté	0.05	0.1	3.2	18	3.9	0.33	<0.009	0.5	1.4	9	0.03
2012/02054	Hebridean crab terrine with creme fraiche	0.14	0.11	7.4	23	4.4	2.5	<0.008	0.29	0.93	11	0.03
2012/01966**	1 very large brown crab (only 2 sub-samples)	0.03	0.37	7.8	30	8.3	16	0.08	0.95	2.6	31	0.07
2012/01965**	1 very large brown crab (only 2 sub-samples)	0.01	0.47	30	41	10	26	0.09	1.2	3.7	28	0.08
2012/01964**	Whole Blue swimming crabs (only 1 sub-sample)	0.03	0.36	10	22	9.4	4.6	0.04	0.19	1.3	14	0.04
2012/01963**	Whole Blue swimming crabs (only 1 sub-sample)	<0.007	0.41	10	19	7	2.2	0.02	1	1.9	20	0.03

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/01962**	Whole Blue swimming crabs (only 1 sub-sample)	<0.007	0.53	7.2	25	6.7	2.7	0.02	1.3	1.9	36	0.03
2012/01961*	Whole brown crab	0.04	0.61	34	37	9.5	2	0.1	0.96	11	56	0.07
2012/01960**	Whole brown crab (only 1 sub-sample)	0.61	0.86	19	37	11	7.8	0.1	0.66	5.8	34	0.08
2012/01954**	Whole spider crab (only 1 sub-sample)	0.04	0.17	65	55	7.6	3.3	0.2	1.5	1.3	236	0.13
2012/01957**	Whole Blue swimming crabs (only 1 sub-sample)	0.03	0.24	10	22	10	3.8	0.03	1	1.2	17	0.03
2012/01958**	Whole Blue swimming crabs	0.11	0.35	8.5	30	27	2.8	0.02	1.3	3.5	19	0.02
2012/01959*	Whole brown crab	0.02	0.69	24	24	8.7	4.4	0.07	1.4	3.5	39	0.07
2012/01967	Fresh brown meat	0.02	0.35	28	37	12	5.3	0.11	1.8	2.8	30	0.07
2012/01968	Fresh brown meat	0.06	0.38	25	37	11	4.7	0.1	1.4	2.7	32	0.06
2012/01955	brown meat	0.06	0.42	31	43	14	9.3	0.04	1.6	3.2	28	0.07
2012/01956	brown meat	0.04	0.43	33	45	15	9.8	0.04	1.7	3.4	29	0.07
2012/01972	Cornish Fifty Fifty crab	0.01	0.07	27	41	15	3	0.02	1.7	2	18	0.07
2012/01974	Cornish Fifty Fifty crab	0.15	0.17	32	45	16	3.2	0.02	1.6	1.9	18	0.08
2012/01973	Cornish Brown crab	0.02	0.1	40	30	12	4	0.03	1.9	2.6	22	0.07
2012/01970	Dressed crab	<0.007	0.27	22	35	6.8	0.78	0.06	0.99	2.8	21	0.06
2012/01971	Dressed crab	0.11	0.34	23	34	7.4	0.86	0.06	1.2	2.7	19	0.05
2012/01975	Crab Spread	0.34	0.48	14	20	7.2	2.2	0.04	1	3.5	23	0.05
2012/01978	Crab Spread	0.32	0.46	14	20	7.3	2.2	0.04	1	3.5	22	0.04
2012/01976	Crab paste	0.28	0.34	7.5	18	5.1	1.1	0.02	0.76	4.1	24	0.03
2012/01977	Crab paste	0.02	0.05	2.7	6.8	1.9	0.34	<0.009	0.39	1.5	9.7	0.02
2012/01979	Crab Spread	0.17	0.21	15	29	7.8	2.3	0.03	1.3	3.8	27	0.04
2012/01982	Crab pâté	0.11	0.1	3	16	4.1	0.31	0.01	0.44	1.4	8.9	0.03
2012/01984	Hebridean Crab Pâté Blended with Mayonnaise	0.05	0.14	14	32	9.3	8.8	0.02	0.83	1.4	12	0.07
2012/01983	Hebridean Crab Pâté Blended with Mayonnaise	0.08	0.14	14	32	9.7	8.9	0.02	0.86	1.4	13	0.06
2012/01981	Hebridean Crab Pâté Blended with Mayonnaise	0.04	0.11	14	30	10	9	<0.009	1.1	1.2	15	0.07
2012/01980	Hebridean Crab Pâté Blended with Mayonnaise	0.06	0.11	13	28	9.3	8.3	<0.009	0.97	1.1	15	0.06
2012/01985	Luxury Orkney crab terrine	0.03	0.07	8	22	4.4	3.6	0.02	0.65	1.6	10	0.03

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/01986	Tinned dressed crab	0.04	0.12	13	52	7.8	7.3	0.03	0.94	1.5	23	0.07
2012/01987	Crab pâté	0.23	0.09	2.8	15	3.5	0.31	<0.005	0.46	1.3	8.6	0.03
2012/03226	Hebridean 4 mini dressed crabs	0.24	0.17	8.1	41	6.4	2.6	0.01	0.94	0.82	9.8	0.09
2012/02964*	Whole brown crab	0.05	0.09	30	27	7.8	2.3	0.04	1.1	3.3	52	0.04
2012/02965*	Whole brown crab	0.15	0.17	11	20	7.5	1.7	0.05	1.4	14	47	0.08
2012/02966*	Whole brown crab	0.04	0.09	19	21	6.6	7	0.04	0.92	3.1	55	0.08
2012/02967*	Whole brown crab	0.08	0.11	39	26	4.5	1.4	0.03	0.93	1.1	25	0.02
2012/02968*	Whole brown crab	0.02	0.12	62	29	8	3.2	0.05	1.2	3.2	29	0.07
2012/02969*	Whole brown crab	0.1	0.11	23	19	5	1.8	0.02	0.88	3.5	40	0.03
2012/02970*	Whole brown crab	0.09	0.08	65	24	5.6	2.4	0.03	0.94	1.3	30	0.05
2012/02971*	Whole brown crab	0.02	0.05	71	29	5.6	3.2	0.04	0.94	4.1	27	0.04
2012/02972*	Whole brown crab	0.06	0.07	127	36	22	6.5	0.05	1.2	2.4	22	0.09
2012/02973*	Whole brown crab	0.01	0.02	39	35	8.4	5.8	0.08	0.94	1.7	24	0.07
2012/02974*	Whole brown crab	0.2	0.17	68	28	8.6	2.8	0.03	1.2	2.1	24	0.05
2012/02975*	Whole brown crab	0.03	0.11	17	22	5.8	4.8	0.08	1.4	3	57	0.11
2012/02976*	Whole brown crab	0.23	0.18	19	22	4.9	3.3	0.02	0.87	1.1	28	0.05
2012/02977*	Whole brown crab	0.04	0.12	22	22	4.8	2.2	0.04	1.3	2.1	45	0.06
2012/02978*	Whole brown crab	0.03	0.05	30	19	8.5	4.4	0.06	1.1	2.2	23	0.07
2012/02979*	Whole brown crab	0.34	0.24	52	25	5.1	3.1	0.03	1.1	1.9	37	0.04
2012/02980	Dressed crab	0.09	0.13	25	52	11	1.3	0.11	1.9	3.4	28	0.06
2012/02981	Dressed crab	0.23	0.18	19	47	8.9	1.3	0.08	1.7	2.9	24	0.06
2012/02982	Dressed crab	0.04	0.13	21	47	7.9	1.4	0.11	2	3.7	22	0.07
2012/02983	Dressed crab	0.04	0.07	15	42	8.6	1.2	0.1	2	3.5	20	0.06
2012/02934	Crab Spread	0.09	0.14	15	20	8.2	3.2	0.04	0.97	3.5	22	0.06
2012/02935	Crab Spread	0.1	0.17	17	22	8.9	3.3	0.09	1.1	3.9	26	0.06
2012/02940	Luxury Orkney Crab Terrine	0.12	0.1	8.1	22	5.2	2.9	0.02	0.56	1.5	15	0.03
2012/02941	Luxury Orkney Crab Terrine	0.11	0.1	8	21	5.1	2.8	0.02	0.51	1.6	15	0.03
2012/02942	Luxury Orkney Crab Terrine	0.24	0.16	8.3	22	5.3	2.7	0.01	0.54	1.7	15	0.03
2012/02943	Luxury Orkney Crab Terrine	0.16	0.14	9.2	21	5.8	2.7	0.02	0.62	1.8	17	0.02
2012/02944	Luxury Orkney Crab Terrine	0.13	0.11	9.1	20	5.7	2.6	0.02	0.41	1.8	17	0.02
2012/02945	Luxury Orkney Crab Terrine	0.1	0.1	9.9	24	6.3	3.3	0.02	0.68	2	17	0.02
2012/02946	Luxury Orkney Crab Terrine	0.1	0.11	9	20	5.3	3.2	0.02	0.62	1.9	15	0.03
2012/02947	Luxury Orkney Crab Terrine	0.09	0.09	10	24	6.2	3.8	0.01	0.77	1.9	14	0.03
2012/01900	Dressed crab	0.16	0.2	34	39	13	2.8	0.04	1.5	2.2	19	0.08

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/01901	Dressed crab	0.22	0.24	36	48	15	2.9	0.04	1.7	2.2	23	0.09
2012/01904	Tinned dressed crabs	0.23	0.26	11	42	9	6.1	0.01	0.93	1.3	23	0.06
2012/01899	Tinned dressed crabs	0.96	0.67	12	45	10	6.6	0.02	1.2	1.5	32	0.06
2012/01903	Tinned dressed crabs	0.17	0.19	7.5	30	6	4.2	0.01	0.57	0.86	17	0.04
2012/01902	Tinned dressed crabs	0.3	0.34	12	44	9.3	6.4	0.03	1	1.4	26	0.06
2012/02126	Brown crab meat	0.06	0.1	32	38	12	3.7	0.07	1.5	5.3	23	0.1
2012/02127	Brown crab meat	0.07	0.13	34	39	12	3.9	0.07	1.5	6.1	25	0.11
2012/02128	Brown crab meat	0.05	0.13	27	31	13	3.8	0.06	1.5	5.8	24	0.1
2012/02129	Brown crab meat	0.13	0.11	12	55	6.2	3.8	0.01	0.61	1.4	11	0.11
2012/02134	Brown crab meat	0.07	0.12	37	37	14	4.6	0.03	1.4	2.1	16	0.06
2012/02135	Brown crab meat	0.02	0.09	36	37	14	4.6	0.04	1.9	2.3	16	0.07
2012/02122	Dressed crab	0.03	0.11	18	23	7.2	1.2	0.02	0.87	3.5	22	0.05
2012/02123	Dressed crab	0.03	0.39	27	26	9.1	1.7	0.03	1.1	3.9	27	0.07
2012/02124	Dressed crab	0.04	0.12	20	23	7.8	1.4	0.03	0.92	3.9	26	0.05
2012/02125	Dressed crab	0.02	0.09	25	27	9.6	1.6	0.03	1.2	3.6	27	0.08
2012/02130	Dressed layered crab	0.09	0.08	8.5	34	4.5	3	0.01	0.25	0.81	8.2	0.07
2012/02136	Cornish Fifty Fifty Crab	0.03	0.07	26	36	15	4.1	0.03	1.1	2	15	0.07
2012/02137	Cornish Fifty Fifty Crab	0.05	0.09	27	40	16	3.9	0.03	1.5	2.1	15	0.06
2012/02138	Cornish Fifty Fifty Crab	0.02	0.07	30	38	16	4	0.03	1.6	2.1	16	0.06
2012/02132	Crab Spread	0.15	0.18	13	21	6.5	2.1	0.02	0.36	2.9	17	0.03
2012/02133	Crab Paté	0.03	0.05	2.8	17	3.5	0.35	<0.009	0.38	1.2	7.6	0.03
2012/02948	Tinned minced crab with spices	0.15	0.81	3.4	7.1	0.35	0.05	0.11	0.19	5.3	10	<0.004
2012/02949	Tinned minced crab with spices	0.24	0.88	2.4	7.5	0.37	0.05	0.05	0.2	5.6	11	<0.004
2012/02987*	Whole brown crab	0.03	0.09	25	17	9.1	3.4	0.1	1.5	21	35	0.11
2012/02988*	Whole brown crab	0.03	0.08	8.2	21	4.6	2	0.14	1.2	9.5	28	0.11
2012/02989*	Whole brown crab	0.02	0.12	21	21	10	2.9	0.09	1.6	14	36	0.09
2012/02990**	Whole brown crab	0.08	0.09	10	16	7.5	1.6	0.09	1.2	7.8	31	0.08
2012/02991**	Whole brown crab	0.06	0.13	17	22	6.4	0.99	0.08	1.7	6	39	0.11
2012/02992**	Whole brown crab	0.02	0.1	12	23	7.3	3.3	0.14	1.5	17	50	0.12
2012/02993*	Whole brown crab	0.12	0.15	21	23	9.4	2	0.07	1.5	18	36	0.1
2012/02994**	Whole brown crab	0.03	0.09	17	19	6.6	3.7	0.12	1.4	21	45	0.12
2012/02995**	Whole brown crab	0.03	0.16	20	21	8.9	3.2	0.13	1.6	22	44	0.14
2012/02996*	Whole brown crab	0.03	0.13	30	26	7.2	3	0.1	1.5	18	32	0.1
2012/02997**	Whole brown crab	0.04	0.18	36	24	10	2.6	0.12	2	17	40	0.13
2012/02998**	Whole brown crab	0.04	0.14	16	21	8.1	2.7	0.11	1.6	8.9	38	0.12
2012/02999*	Whole brown crab	0.19	0.09	34	22	11	3.6	0.18	1.4	10	30	0.1
2012/03000**	Whole brown crab	0.04	0.12	20	21	11	1.9	0.09	1.5	16	41	0.11

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/02984	Dressed crab	0.02	0.04	24	32	6.2	0.46	0.08	1	3.6	18	0.06
2012/02985	Dressed crab	0.09	0.08	16	33	5.2	0.55	0.06	0.95	10	17	0.05
2012/02986	Dressed crab	0.02	0.04	28	47	5	1.2	0.05	0.88	6.4	36	0.05
2012/02950	Crab Spread	0.24	0.27	18	25	9.3	3.3	0.04	0.98	4	29	0.05
2012/02951	Crab Spread	0.16	0.2	17	21	9.4	3.4	0.05	1.1	4	27	0.05
2012/02954	Crab Spread	0.32	0.27	16	22	7.2	1.7	0.05	0.89	3.3	26	0.03
2012/02955	Crab Spread	0.21	0.24	18	23	9.1	3.9	0.06	0.98	3.2	29	0.04
2012/01938*	Whole brown crab	<0.006	0.04	17	27	3.7	1.4	0.11	1	5	17	0.08
2012/01939	Dressed crab	<0.007	0.05	26	40	6.3	0.74	0.06	1	4.8	14	0.08
2012/01940	Dressed crab	<0.006	0.04	22	46	6.9	0.61	0.05	1	3.9	12	0.1
2012/01944	Crab Spread	0.46	0.51	11	17	6.9	1.5	0.03	0.8	3.1	21	0.04
2012/01945	Crab Spread	0.33	0.43	11	17	6.7	1.5	0.03	0.87	3.1	20	0.04
2012/01946	Crab Spread	0.43	0.5	12	22	7.2	2.7	0.03	0.93	3	21	0.04
2012/01947	Crab Spread	0.38	0.51	14	21	8.1	2.9	0.04	1	3.4	31	0.05
2012/01948	Crab Spread	0.24	0.34	10	16	5.6	1.4	0.02	0.76	2.5	16	0.03
2012/01952	Scottish Orkney crab pâté	0.02	0.09	13	32	8.6	6.2	0.02	0.69	1.6	14	0.05
2012/01951	Scottish Orkney crab pâté	0.1	0.12	12	29	7.1	5.8	0.02	0.65	1.6	12	0.05
2012/01949	Luxury Orkney Crab Terrine	0.1	0.26	8.5	23	6.1	3.9	0.01	0.65	1.8	16	0.03
2012/01950	Luxury Orkney Crab Terrine	0.14	0.27	9.2	23	6.2	4.2	0.01	0.76	1.7	18	0.03
2012/01953	Tinned dressed crab	0.5	0.5	15	50	10	6.5	0.03	0.99	1.4	28	0.08
2012/03047	Dressed crab	0.09	<0.022	13	42	8.5	4.8	0.02	0.77	1.5	14	0.1
2012/03041	Crab Spread	0.09	0.15	15	19	8.4	2.6	0.04	0.95	3.5	24	0.05
2012/03042	Crab Spread	0.11	0.16	16	20	7.6	2.8	0.05	0.99	3.5	26	0.05
2012/03057	Crab Spread	0.2	0.13	13	19	7.1	3.3	0.05	1	3.5	26	0.05
2012/03058	Crab Spread	0.17	0.29	15	22	7.7	3.8	0.06	1.1	3.4	27	0.05
2012/03060	Scottish Orkney crab Paté	0.11	0.14	14	31	10	5.6	0.02	0.77	1.4	15	0.06
2012/03061	Scottish Orkney crab Paté	0.06	0.13	13	30	10	5.4	0.02	0.72	1.3	14	0.05
2012/03062	Scottish Orkney crab Paté	0.07	0.11	11	25	8.7	4.6	0.01	0.55	1.2	13	0.04
2012/03063	Scottish Orkney crab Paté	0.08	0.17	14	30	9.6	5.6	0.02	0.7	1.4	16	0.05
2012/03043	Luxury Orkney Crab Terrine	0.12	0.1	8	19	4.7	3.4	0.01	0.49	1.5	15	0.02
2012/03044	Luxury Orkney Crab Terrine	0.13	0.1	7.5	19	4.4	2.8	0.01	0.51	1.4	12	0.03
2012/03045	Luxury Orkney Crab Terrine	0.11	0.09	8.2	20	4.7	3.5	0.01	0.51	1.5	15	0.03
2012/03046	Luxury Orkney Crab Terrine	0.12	<0.023	8.6	20	4.9	3.5	0.01	0.55	1.8	18	0.03
2012/03048	Crab Pâté	0.02	<0.025	12	37	6.3	6.2	<0.014	0.58	1.6	9.4	0.08
2012/03049	Crab Pâté	0.02	<0.023	12	34	5.8	5.1	<0.013	0.7	1.8	11	0.09
2012/03050	Crab Pâté	0.03	<0.024	12	35	6.1	5.1	<0.013	0.74	1.8	11	0.09
2012/03051	Crab Pâté	0.03	<0.023	12	36	6.2	5.8	<0.013	0.65	1.7	11	0.1

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/03053	Hebridean Crab Pâté Blended with Mayonnaise	0.03	<0.019	14	28	10	8.2	0.01	0.92	1.1	13	0.08
2012/03054	Hebridean Crab Pâté Blended with Mayonnaise	0.07	0.05	15	31	10	8.9	0.01	0.82	1.3	14	0.08
2012/03055	Hebridean Crab Pâté Blended with Mayonnaise	0.03	<0.019	14	29	10	8.3	0.01	0.91	1.2	13	0.07
2012/03056	Hebridean Crab Pâté Blended with Mayonnaise	0.03	0.03	15	30	9.7	8.6	0.02	0.81	1.2	14	0.08
2012/03164**	Whole brown crab	0.1	0.04	22	20	9.6	9.4	0.07	1.3	6.3	64	0.06
2012/03165**	Whole brown crab	0.14	0.08	21	32	10	8.9	0.18	1.1	7.1	36	0.11
2012/03166**	Whole brown crab	0.07	0.04	19	25	11	10	0.15	1	5.1	33	0.06
2012/03167**	Whole brown crab	0.13	0.06	11	23	9.2	4.6	0.12	0.95	4.4	38	0.04
2012/03168**	Whole brown crab	0.13	0.07	17	25	9.6	5	0.08	1	7.6	40	0.06
2012/03169**	Whole brown crab	0.25	0.18	13	47	15	0.43	0.06	1.4	2.6	28	0.1
2012/03170**	Whole brown crab	0.06	0.07	32	26	5.8	5	0.15	0.75	4.8	37	0.08
2012/03157*	Whole brown crab	0.1	0.06	23	35	15	1.8	0.11	1.6	8.5	54	0.16
2012/03158*	Whole brown crab	0.09	0.37	27	39	6.8	1.8	0.09	1.5	4.1	24	0.13
2012/03159*	Whole brown crab	0.09	0.12	33	40	11	2.4	0.14	1.5	4.9	29	0.16
2012/03160*	Whole brown crab	0.11	0.17	30	33	9.9	1.8	0.09	1.3	7.7	25	0.1
2012/03161*	Whole brown crab	0.16	0.16	34	36	13	2	0.07	1.3	8.2	26	0.12
2012/03162*	Whole brown crab	0.05	0.08	26	33	8.5	1.6	0.09	1.1	12	19	0.05
2012/03163*	Whole brown crab	0.07	0.04	16	31	7.2	1.3	0.1	1.2	4.3	25	0.13
2012/03151	Dressed crab	0.17	0.08	39	53	6.4	0.74	0.07	0.76	21	18	0.18
2012/03152	Dressed crab	0.1	0.06	17	46	8.5	1.4	0.06	0.75	7.2	37	0.15
2012/03153	Dressed crab	0.1	0.03	36	48	4	0.28	0.04	0.66	2.1	13	0.06
2012/03154	Dressed crab	0.14	0.06	27	47	7.1	0.59	0.06	0.76	3.8	19	0.15
2012/03155	Dressed crab	0.07	<0.022	31	47	6.7	0.22	0.06	0.62	3.9	12	0.1
2012/03156	Dressed crab	0.19	0.05	45	38	5.1	0.45	0.08	0.7	15	21	0.1
2012/03174	Devon Brown crab meat	0.21	0.23	26	34	14	7.3	0.1	1.8	3.3	30	0.09
2012/03175	Devon Brown crab meat	0.13	0.3	23	32	14	4.6	0.1	2.5	2.9	42	0.08
2012/03176	Devon Brown crab meat	0.06	0.21	17	33	13	5.6	0.1	1.9	3.1	34	0.08
2012/03177	Devon Brown crab meat	0.55	0.57	21	30	13	4.9	0.11	1.5	2.7	47	0.08
2012/03171	Dressed Devon Crab	0.03	0.05	25	18	14	3.3	0.14	0.57	3.8	36	0.08
2012/03172	Dressed Devon Crab	0.08	0.08	11	40	14	0.36	0.04	1.1	1.8	22	0.07
2012/03173	Dressed Devon Crab	0.13	0.12	14	49	16	0.37	0.05	1.8	2.3	27	0.09
2012/03149	Dressed layered crab	0.12	0.06	9.4	39	7.9	3	<0.014	0.6	0.94	11	0.08
2012/03150	Hebridean Mini Dressed crabs	0.05	0.05	5.9	29	5.8	1.7	<0.011	0.42	0.56	6.8	0.06

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/03144	Cornish Fifty Fifty Crab	0.03	0.07	23	52	15	2.1	0.01	1.2	1.4	9.2	0.09
2012/03141	Crab Spread	0.31	0.23	17	22	9.8	2.8	0.05	1	4.3	23	0.06
2012/03142	Crab Spread	0.12	0.17	15	20	8.3	2.4	0.04	0.91	3.9	22	0.06
2012/03143	Crab Spread	0.46	0.34	16	22	9.2	2.6	0.05	0.94	4.3	25	0.06
2012/03140	Crab Spread	0.28	0.29	16	23	8.2	3.1	0.03	0.99	3.8	22	0.06
2012/03145	Hebridean Crab Pâté Blended with Mayonnaise	0.11	0.11	17	35	11	8.3	0.02	0.88	1.7	11	0.08
2012/03148	Hebridean crab terrine with creme fraiche	0.04	0.04	6	22	4.6	1.8	<0.013	0.36	0.92	6.2	0.05
2012/03146	Potted crab	0.07	0.09	22	35	11	1.9	0.01	1	1.2	7.9	0.05
2012/03147	Potted crab	0.01	0.05	24	38	12	1.9	0.01	1	1.5	8.8	0.06
2012/03202	Crab Spread	0.21	0.28	16	22	7.4	3.7	0.05	0.92	3.5	25	0.05
2012/03203	Crab Spread	0.14	0.18	15	19	7.4	3.6	0.05	0.73	3.4	25	0.06
2012/03204	Crab Spread	0.1	0.14	15	20	7.9	2.5	0.05	0.93	3.4	21	0.07
2012/03205	Crab Spread	0.62	0.45	15	20	8.2	2.6	0.05	1.3	3.4	23	0.05
2012/03206	Crab Spread	0.07	0.13	14	19	7.8	2.5	0.05	1.3	3.3	20	0.05
2012/03207	Crab Spread	0.21	0.23	17	23	9.4	2.8	0.05	1.4	3.9	24	0.06
2012/03208	Crab Spread	0.22	0.21	14	20	7.7	3.5	0.05	1.2	3.2	22	0.06
2012/03209	Crab Spread	0.13	0.18	17	24	9.4	2.8	0.05	1.4	3.9	25	0.06
2012/03210	Crab Spread	0.24	0.24	15	24	8.6	4.3	0.05	1.3	3.4	24	0.05
2012/03211	Crab Spread	0.27	0.25	15	26	8	2.9	0.04	1.2	3.2	23	0.03
2012/03212	Crab Spread	0.32	0.3	17	23	9.1	2.8	0.05	1.4	3.9	26	0.06
2012/03213	Crab Spread	0.37	0.34	16	27	8	2	0.03	0.89	3.9	23	0.04
2012/03214	Crab Spread	0.33	0.32	13	29	8.4	3.2	0.03	0.82	3.3	26	0.04
2012/03215	Crab Spread	0.31	0.3	16	27	6.9	1.8	0.03	0.84	3.4	25	0.04
2012/03216	Crab Spread	0.52	0.42	17	35	9.5	2.8	0.03	1	3.9	26	0.04
2012/03217	Crab Spread	0.38	0.33	16	29	7.1	1.9	0.04	0.86	3.5	27	0.04
2012/03218	Crab Spread	0.18	0.21	16	20	7.4	3.4	0.06	0.89	3.9	23	0.05
2012/03219	Crab Spread	0.63	0.42	16	18	6.8	3.4	0.06	0.89	4	23	0.05
2012/03220	Crab Spread	0.21	0.23	16	19	7	3.3	0.06	0.85	3.9	22	0.05
2012/03221	Crab Spread	0.1	0.09	3.3	8.7	3	0.47	0.01	0.31	2.1	12	0.03
2012/03222	Crab Spread	0.2	0.14	3	8.2	2.9	0.45	<0.014	0.32	1.9	12	0.03
2012/03223	Crab Spread	0.05	0.07	3.1	7.1	2.5	0.45	0.01	0.29	1.7	11	0.03
2012/03224	Crab Spread	0.3	0.2	3.2	8.6	2.8	0.48	0.02	0.32	2	12	0.03
2012/03225	Crab Spread	0.09	0.08	3.2	8.4	2.8	0.47	0.01	0.32	1.9	11	0.03
2012/03227	Dressed crab	0.03	0.07	36	62	16	2	0.07	1.9	1.7	18	0.09
2012/01870	Dressed crab	0.23	0.52	24	21	5.7	1.2	0.04	1.1	4.4	26	0.04

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/02023**	Whole soft shell crab (no sample)	no sample	no sample	no sample	no sample	no sample	no sample	no sample	no sample	no sample	no sample	no sample
2012/02019*	Whole brown crab	0.03	0.07	36	33	10	3	0.06	1.2	3.8	21	0.05
2012/02020*	Whole brown crab	0.03	0.06	35	30	11	6.7	0.11	1.2	2.9	38	0.07
2012/02021*	Whole spider crab (only 1 sub-sample)	0.08	0.05	117	35	28	4.7	0.19	1.3	1.3	151	0.14
2012/02022*	Whole spider crab (only 2 sub-samples)	0.11	0.11	20	32	14	2	0.08	1.4	1.2	51	0.1
2012/02116**	Whole jumbo soft crab (Mangrove crab)	0.12	0.04	3	34	1.8	0.11	0.01	0.95	10	28	0.02
2012/02119**	Whole soft shell crab (Mangrove crab)	0.08	0.05	8.9	46	2.2	0.26	0.02	0.57	8.8	12	0.06
2012/02120**	Whole soft shell crab (Mangrove crab)	0.01	0.02	7.9	48	2.2	0.25	0.02	0.63	6.7	9.9	0.03
2012/02121**	Whole soft shell crab (Mangrove crab)	0.02	0.14	89	103	2.9	0.23	3	0.71	8.2	13	0.04
2012/01915*	Whole brown crab	0.17	0.48	56	25	12	7.8	0.07	1.5	4.8	44	0.09
2012/01804**	Whole brown crab	0.42	0.33	20	18	14	3.5	0.06	2.1	1.6	33	0.12
2012/01814**	Whole brown crab	0.28	0.41	37	33	13	2.7	0.01	1.3	2.3	22	0.05
2012/01885	Brown crab meat	0.24	0.21	16	55	16	4.8	0.06	2.1	3.6	28	0.06
2012/02016	Brown crab meat	0.03	0.3	26	68	19	4.2	0.06	2.7	4	27	0.07
2012/02017	Brown crab meat	0.04	0.09	31	35	16	3.8	0.05	1.6	3.4	14	0.08
2012/02018	Brown crab meat	0.02	0.05	25	25	9.8	1.7	0.05	0.94	1.7	13	0.02
2012/01802	Brown crab meat	0.31	0.28	38	41	19	4.1	0.09	2.9	2.7	30	0.08
2012/01805	Brown crab meat	0.25	0.27	28	28	9.8	2.2	0.05	1.5	2.1	28	0.05
2012/01815	Brown crab meat	0.32	0.57	31	29	17	2.7	0.02	1.7	7.2	28	0.06
2012/01865	Brown crab meat	0.32	0.43	19	34	15	9.3	0.03	2.2	3.2	25	0.08
2012/01869	Brown crab meat	0.23	0.39	29	36	11	1.6	0.07	1.8	5.2	26	0.07
2012/01884	Dressed crab	0.3	0.24	13	47	15	3.6	0.04	1.6	2.3	23	0.06
2012/02025	Dressed crab	0.03	0.07	34	45	16	1.9	0.06	1.4	1.8	16	0.04
2012/01803	Dressed crab	0.27	0.23	27	41	16	1.8	0.04	1.7	2.6	24	0.06
2012/01813	Dressed crab	0.3	0.47	29	46	18	2	0.02	1.7	5.5	25	0.08
2012/01867	Dressed crab	0.26	0.21	18	57	17	0.6	0.03	1.8	2.4	18	0.14
2012/01886	Potted crab	0.21	0.23	13	23	7.1	3.1	0.01	0.85	1.8	16	0.03
2012/01866	Crab pâté	0.54	0.37	14	27	14	8.8	0.02	2.4	2.7	21	0.06
2012/01868	Crab pâté	0.41	0.21	9.3	16	3.1	0.34	0.02	0.87	1.7	15	0.02
2012/02026	Crab bisque	0.07	0.08	1.1	2.5	1.1	0.28	0.24	0.11	0.53	27	<0.004
2012/02027	Crab Soup	0.02	0.17	4.3	8.6	2.3	1.8	<0.007	0.45	0.98	10	0.01

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/02028	Crab Soup	0.03	0.09	5.6	11	2.8	1.5	<0.009	0.35	1.3	5.4	0.01
2012/02029	Crab Soup	0.03	0.18	4	9	3.1	1.8	0.01	0.42	1	9	0.02
2012/02117	Crab cake	0.21	0.07	3.6	20	2	0.08	0.01	0.35	2	5.3	0.02
2012/02118	Korean Crab combined meat (snow crab meat)	0.08	0.03	14	23	7.5	0.07	0.02	0.6	0.34	1.7	0.2
2012/02240*	Whole Brown crab	0.14	0.04	18	23	16	1.6	0.02	1.1	16	26	0.07
2012/02241*	Whole Brown crab	0.19	0.06	9.6	20	12	0.61	0.02	1.1	15	39	0.08
2012/02249*	Whole Brown crab	0.03	0.05	26	34	16	3.5	0.04	1.6	3.9	47	0.13
2012/02250**	Whole Brown crab	0.05	0.14	29	35	9.3	2.7	0.04	1.4	13	44	0.12
2012/02242	Brown meat	0.21	0.07	23	28	14	1.6	0.03	1.2	4.4	27	0.07
2012/02243	Dressed crab	0.11	0.04	17	59	20	0.99	0.02	1.2	3.1	19	0.14
2012/02244	Dressed crab	0.12	0.03	15	58	17	0.94	0.02	1.4	3.4	24	0.11
2012/02109	Crab paste	0.19	0.17	4.3	9.3	4	0.42	0.01	0.24	2.6	12	0.02
2012/02112	Scottish Orkney crab pâté	0.12	0.12	11	23	8.4	5.5	0.01	0.59	1.6	11	0.04
2012/02103	Tinned dressed crab	0.13	0.17	14	58	11	7.6	0.03	1	1.5	21	0.08
2012/02475	Crab flavoured paste	0.09	0.08	3.4	9	2.4	0.31	<0.014	0.4	1.1	9.4	<0.007
2012/02471	Orkney Crab pâté	0.14	0.14	9.7	34	6	4.7	<0.012	0.65	1.5	6.5	0.08
2012/02478	Tinned dressed crab	0.09	0.11	13	51	9.7	6.5	0.02	1.1	1.5	22	0.08
2012/02466**	Whole brown crab	0.62	0.35	21	23	6.1	1.3	0.04	0.67	3.9	30	0.04
2012/02467**	Whole brown crab	0.02	0.03	25	15	5.9	0.74	0.04	0.92	5.8	33	0.04
2012/02461	4 mini dressed Orkney crabs	0.1	0.16	7.6	48	9.8	2.7	<0.011	0.75	1.3	15	0.1
2012/02462	4 mini dressed Orkney crabs	0.11	0.09	7.9	48	9.2	2.8	<0.013	0.67	1.2	16	0.1
2012/02458	Crab Spread	0.16	0.2	16	23	7.6	3.4	0.04	1	3.2	26	0.05
2012/02470	Crab pâté with lemon	0.06	0.04	1.7	17	2.8	0.01	0.03	0.57	0.2	3.7	0.05
2012/02460	Luxury Orkney Crab Terrine	0.09	0.08	8.6	21	5.2	3.6	<0.013	0.67	1.4	17	0.03
2012/02239**	Whole brown crab	0.18	0.12	8.4	26	8.8	4.1	0.01	1.2	3.4	26	0.05
2012/02107	Crab Spread	0.06	0.28	19	26	7.1	1.9	0.06	0.88	4.4	20	0.05
2012/03506	Dressed crabs	0.07	0.13	18	38	9.8	4.5	0.07	1.2	3	25	0.08
2012/03507	Dressed crabs	0.08	0.15	19	36	9.7	4.6	0.07	1.2	3.3	29	0.06
2012/03013	Crab spread	0.21	0.18	14	25	8.5	2.6	0.03	1	3.5	22	0.05
2012/03008	Crab Terrine	0.09	0.08	8.6	17	4.1	4.3	0.01	0.54	1.3	12	0.03
2012/03508	Dressed crabs	0.17	0.18	18	39	9.2	4.1	0.06	1.1	3	25	0.09
2012/03020	Crab spread	0.21	0.2	15	20	7.3	1.7	0.04	1.1	3.5	22	0.04
2012/03077	Brown meat	0.04	0.12	23	39	13	4.4	0.04	1.8	2.3	27	0.07
2012/03075	Brown meat	0.06	0.14	32	44	14	4.8	0.05	1.9	2.9	32	0.07
2012/03076	Brown meat	0.03	0.11	23	40	13	4.5	0.04	1.8	2.6	27	0.06
2012/03067*	Whole brown crab	0.03	0.11	53	34	8.9	14	0.05	1.3	2	46	0.18

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/03068*	Whole brown crab	0.01	<0.022	47	30	8	10	0.02	1	2.4	23	0.07
2012/03073	Orkney Mini dressed crabs	0.06	0.08	8.4	50	10	2.6	0.01	0.89	1.2	8.8	0.11
2012/03074	Orkney Mini dressed crabs	0.09	0.1	8.4	48	9.4	2.6	0.01	0.67	0.98	13	0.1
2012/03069	Scottish Orkney Crab Pâté	0.06	0.08	13	27	9.6	4.8	0.01	0.8	1.3	19	0.06
2012/03115	Crab spread	0.09	0.17	15	20	8.8	2.6	0.04	1	4.1	21	0.05
2012/03116	Crab spread	0.09	0.14	15	20	8.6	2.6	0.05	1.1	4	21	0.05
2012/03117*	Whole brown crabs	0.02	0.12	70	50	12	4.7	0.1	1.7	6.8	35	0.17
2012/03118*	Whole brown crabs	0.03	0.12	49	34	18	3.3	0.1	1.9	6.6	32	0.21
2012/03119	Scottish Orkney Crab Pâté	0.14	0.14	12	28	8.9	3.7	0.02	0.71	1.9	14	0.05
2012/03123*	Whole brown crab	0.03	0.14	40	34	15	16	0.03	1.7	17	30	0.15
2012/03124*	Whole brown crab	0.05	0.08	33	68	15	14	0.02	1.6	5.9	25	0.12
2012/03128	Crab and Prawn terrine	0.05	0.05	4.6	12	3.1	2.1	<0.012	0.3	0.78	5.1	0.03
2012/03129	Crab spread	0.06	0.11	12	27	6.6	5.8	0.02	0.86	2.8	16	0.05
2012/03231	Pasteurised Brown meat	0.12	0.12	20	64	15	5.1	0.09	1.7	3.9	29	0.06
2012/03232	Pasteurised Brown meat	0.05	0.09	22	73	17	5.6	0.11	1.9	4.5	32	0.07
2012/03233	Pasteurised Brown meat	0.04	0.1	22	76	17	5.5	0.1	1.8	4.6	34	0.07
2012/03234	Pasteurised Brown meat	0.05	0.1	23	78	18	5.8	0.27	2	4.6	33	0.07
2012/03235	Pasteurised Brown meat	0.16	0.14	17	45	11	4.3	0.08	1.4	2.9	21	0.05
2012/03236	Pasteurised Brown meat	0.06	0.1	20	71	16	5.2	0.09	1.7	4.3	32	0.06
2012/03237	Pasteurised Brown meat	0.06	0.09	23	74	17	5.8	0.11	2	4.6	33	0.07
2012/03238	Pasteurised Brown meat	0.11	0.11	16	54	13	4.1	0.07	1.4	3.3	24	0.05
2012/03239	Pasteurised Brown meat	0.2	0.2	13	18	6.7	2.8	0.05	0.74	3.5	20	0.04
2012/03240	Pasteurised Brown meat	0.03	0.08	19	67	15	4.9	0.09	1.8	4	29	0.07
2012/03241	Brown Meat	0.03	0.1	25	34	11	5.1	0.07	1.6	2.6	22	0.06
2012/03242	Brown Meat	0.09	0.15	28	35	11	5.7	0.08	1.4	2.6	24	0.08
2012/03243	Brown Meat	0.04	0.1	26	42	10	3.5	0.05	1.5	1.9	16	0.07
2012/03244	Brown Meat	0.02	0.12	28	40	12	5.6	0.08	1.4	2.8	26	0.08
2012/03245	Brown Meat	0.02	0.11	27	37	11	5.5	0.08	1.5	2.6	24	0.08
2012/03246	Brown Meat	0.02	0.08	23	39	9.7	3.3	0.05	1.3	1.8	16	0.06
2012/03247	Brown Meat	0.04	0.1	27	36	11	5.6	0.08	1.4	2.5	23	0.08
2012/03248	Brown Meat	0.04	0.1	27	37	11	5.6	0.08	1.4	2.6	24	0.08
2012/03249	Brown Meat	0.03	0.09	28	42	11	4.4	0.06	1.5	2.2	19	0.07
2012/03250	Brown Meat	0.02	0.12	28	39	11	5.3	0.07	1.4	2.6	25	0.08
2012/03251*	Whole brown crab	0.16	0.13	122	35	15	7.1	0.09	1.6	2.5	20	0.13
2012/03252**	Whole brown crab	0.04	0.12	111	28	8.7	3.9	0.08	2	2.7	20	0.15
2012/03253**	Whole brown crab	0.04	0.17	30	31	16	6.2	0.13	1.9	3.7	35	0.18
2012/03254**	Whole brown crab (no sample)	no sample	no sample	no sample	no sample	no sample	no sample	no sample	no sample	no sample	no sample	

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/03255**	Whole brown crab	0.07	0.13	42	29	14	3.5	0.12	1.5	4.3	51	0.1
2012/03256*	Whole brown crab	0.04	0.2	50	29	9	4.2	0.13	1.8	3.3	57	0.11
2012/03257**	Whole brown crab	0.04	0.13	28	23	6	3.6	0.1	1.5	5.5	65	0.06
2012/03258**	Whole brown crab	0.23	0.24	37	33	11	4.6	0.12	1.7	4.9	64	0.1
2012/03259*	Whole brown crab	0.04	0.13	7.6	25	5.1	3.1	0.12	1.7	5.4	70	0.06
2012/03260*	Whole brown crab	0.02	0.04	33	22	8	2.8	0.05	1.4	1.1	18	0.08
2012/03261	Brown meat	0.11	0.13	31	47	14	3.3	0.07	1.8	2.7	24	0.11
2012/03262	Brown meat	0.03	0.1	48	44	18	8.3	0.06	2.1	3.3	19	0.11
2012/03263	Brown meat	0.07	0.1	29	46	16	4.2	0.07	2.1	2.7	19	0.11
2012/03264	Brown meat	0.03	0.11	41	43	14	2.8	0.08	2.3	3.3	29	0.06
2012/03265	Brown meat	0.03	0.11	40	42	17	3.4	0.08	2.1	2.9	25	0.09
2012/03266	Brown meat	0.02	0.08	37	41	15	4.3	0.08	2.4	3.6	31	0.08
2012/03267	Brown meat	0.03	0.07	43	43	15	3.3	0.08	2.4	3.4	28	0.05
2012/03268	Brown meat	0.03	0.08	44	44	18	4.5	0.07	2	3.2	20	0.1
2012/03269	Brown meat	0.03	0.1	51	47	19	5.8	0.07	2.1	3.4	17	0.11
2012/03270	Brown meat	0.02	0.05	38	52	16	5.3	0.04	1.8	2.6	15	0.11
2012/03281	Brown Meat	0.03	0.08	36	44	15	1.8	0.08	1.8	4.5	19	0.11
2012/03282	Brown Meat	0.06	0.1	39	43	14	1.9	0.08	1.5	5.2	17	0.1
2012/03283	Brown Meat	0.03	0.07	29	39	13	1.6	0.08	1.5	4.2	15	0.1
2012/03284	Brown Meat	0.04	0.09	38	42	15	2	0.1	1.6	5.3	20	0.11
2012/03285	Brown Meat	0.04	0.08	37	42	15	1.7	0.08	1.6	4.3	16	0.1
2012/03286	Brown Meat	0.03	0.07	37	47	13	1.6	0.08	1.5	4.8	17	0.11
2012/03287	Brown Meat	0.04	0.08	36	47	13	1.6	0.07	1.5	4.2	17	0.1
2012/03288	Brown Meat	0.04	0.1	35	48	14	2	0.08	1.7	4.5	19	0.1
2012/03289	Brown Meat	0.03	0.07	33	49	12	1.5	0.07	1.6	4.8	17	0.11
2012/03290	Brown Meat	0.06	0.09	31	47	13	1.7	0.08	1.7	3.8	17	0.1
2012/03291*	Whole brown crab	0.01	0.05	82	20	12	2.4	0.06	1.4	12	28	0.12
2012/03292*	Whole brown crab	0.02	0.05	44	30	12	1.7	0.08	1.3	5.9	16	0.1
2012/03293*	Whole brown crab	0.03	0.05	50	32	12	2.1	0.08	1.5	5.7	25	0.09
2012/03294*	Whole brown crab	0.04	0.08	64	30	18	3.3	0.07	1.5	18	31	0.12
2012/03295*	Whole brown crab	<0.007	0.02	35	30	11	1	0.08	1.2	4.1	33	0.1
2012/03296*	Whole brown crab	0.02	0.06	66	32	12	1.4	0.07	1.3	4.8	29	0.09
2012/03321	Dressed crab	0.01	<0.027	22	57	6.7	0.54	0.04	0.94	4.8	17	0.07
2012/03322	Dressed crab	0.02	<0.027	21	53	6	0.28	0.04	0.83	3.5	18	0.06
2012/03323	Dressed crab	0.02	0.08	26	59	8.9	0.66	0.03	1	2.4	19	0.07
2012/03324	Dressed crab	0.03	0.03	11	44	6.4	0.29	0.03	0.91	2.5	18	0.06
2012/03325	Dressed crab	0.03	0.03	14	55	5.5	0.15	0.05	0.89	1.2	12	0.08

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

Laboratory Sample Number	Sample description	Trace and heavy metal concentration (mg/kg w.w.)										
		Cr	Ni	Cu	Zn	As	Cd	Pb	Se	Mn	Fe	Hg
2012/03326	Crab pâté	0.04	0.04	3.7	18	3.9	0.38	<0.015	0.43	1.5	12	0.04
2012/03327	Crab pâté	0.03	0.04	3.4	16	3.5	0.34	<0.014	0.43	1.4	10	0.03
2012/03328	Crab pâté	0.03	0.05	2.8	14	3.1	0.28	0.01	0.4	1.4	9.7	0.04
2012/03329	Crab pâté	0.04	0.05	3.2	18	3.4	0.34	<0.012	0.38	1.5	8	0.04
2012/03330*	Whole brown crab	0.18	0.7	20	27	9.4	2.6	0.1	1.4	4.3	36	0.1
2012/03331*	Whole brown crab	0.03	0.4	21	28	7.2	1.6	0.14	1.5	4.9	56	0.11
2012/03332*	Whole brown crab	0.05	0.11	40	32	14	3.5	0.07	1.2	3.6	35	0.12
2012/03333*	Whole brown crab	0.04	0.56	11	26	6.3	1.3	0.2	1.5	3.8	37	0.15
2012/03334*	Whole brown crab	0.11	0.51	20	28	9	3	0.11	1.5	5.9	32	0.19
2012/03335**	Whole brown crab	0.02	0.16	50	30	14	2.5	0.08	1.7	9.8	34	0.13
2012/03336*	Whole brown crab	0.03	0.16	94	32	15	2.6	0.15	1.5	13	44	0.15
2012/03337**	Whole brown crab	0.06	0.12	28	21	12	1.9	0.05	1.4	13	49	0.14
2012/03338*	Whole brown crab	0.03	0.15	29	27	13	1.7	0.1	1.2	6.8	33	0.1
2012/03339**	Whole brown crab	0.05	0.19	37	29	16	3.6	0.1	1.8	13	45	0.13
2012/03340*	Whole brown crab	0.03	0.41	36	26	11	1.3	0.08	1.5	14	57	0.09
2012/03341**	Whole brown crab	0.02	0.13	79	27	15	2.8	0.08	1.5	18	37	0.13
2012/03342*	Whole brown crab	0.04	0.18	60	27	15	1.9	0.09	1.6	11	36	0.13
2012/03343**	Whole brown crab	0.02	0.06	28	19	15	1.7	0.07	1.3	17	42	0.09
2012/03344*	Whole brown crab	0.03	0.22	24	32	15	2.4	0.09	1.5	5.4	27	0.12
2012/03417**	Whole brown crab	0.14	0.09	38	49	17	5.9	0.06	1.2	3.5	18	0.12
2012/03418**	Whole brown crab	0.02	0.04	29	28	12	4	0.04	0.84	3.3	14	0.07
2012/03419*	Whole brown crab	0.02	0.02	40	35	18	2.5	0.02	0.97	1.4	13	0.08
2012/03420**	Whole brown crab	0.02	0.05	36	35	29	6.4	0.06	0.83	3.6	11	0.1
2012/03421**	Whole brown crab	0.02	0.03	38	34	11	3.9	0.03	0.84	4.6	15	0.08
2012/03422	Brown Meat	0.03	0.04	29	36	11	1.6	0.02	0.92	2.9	10	0.05
2012/03423	Brown Meat	0.03	0.06	33	46	13	1.7	0.03	0.94	4.4	14	0.08
2012/03424	Brown Meat	0.01	0.04	31	38	12	1.7	0.02	0.93	3.5	12	0.06
2012/03425	Brown Meat	0.01	0.04	34	39	13	1.7	0.02	1	3.7	12	0.05
2012/03426	Brown Meat	0.06	0.07	32	37	12	1.7	0.02	0.96	3.2	11	0.05
2012/03427	Brown Meat	0.01	0.04	31	33	12	1.6	0.02	0.93	2.9	9.9	0.06
2012/03428	Brown Meat	0.05	0.07	33	42	13	1.8	0.02	1	4.2	12	0.06
2012/03429	Brown Meat	0.02	0.03	31	35	12	1.6	0.02	0.93	3.3	10	0.07
2012/03430	Brown Meat	0.02	0.06	33	46	14	1.8	0.03	1	4.4	13	0.08
2012/03431	Brown Meat	0.1	0.09	33	38	12	1.8	0.03	0.89	3.8	12	0.08

* brown crabmeat comprises the hepatopancreas as defined in Commission Regulation No 420/2011 (EC, 2011a)

** brown crabmeat includes all edible tissues from the cephalothorax as defined in the Codex Code of Practice for Fish and Fishery Products (WHO, 2012)

APPENDIX 5

About us

Cefas is a multi-disciplinary scientific research and consultancy centre providing a comprehensive range of services in fisheries management, environmental monitoring and assessment, and aquaculture to a large number of clients worldwide.

We have more than 500 staff based in 2 laboratories, our own ocean-going research vessel, and over 100 years of fisheries experience.

We have a long and successful track record in delivering high-quality services to clients in a confidential and impartial manner.
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CTL systems and services are developed by teams that are experienced in fisheries, environmental management and aquaculture, and in working closely with clients to ensure that their needs are fully met.
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With our unique facilities and our breadth of expertise in environmental and fisheries management, we can rapidly put together a multi-disciplinary team of experienced specialists, fully supported by our comprehensive in-house resources.

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We also work successfully in partnership with other organisations, operate in international consortia and have several joint ventures commercialising our intellectual property

Head office
Centre for Environment,
Fisheries & Aquaculture Science
Pakefield Road, Lowestoft,
Suffolk NR33 0HT UK

Tel +44 (0) 1502 56 2244
Fax +44 (0) 1502 51 3865
Web www.cefas.co.uk



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