Surveillance Sampling Programme

Area of research interest: Research projects
Study duration: 2021-10-01
Project status: Completed
Authors: Anne Scarrett, Sally Cooke
Conducted by: Hampshire Scientific Services
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Surveillance Sampling Programme - Executive Summary

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Executive Summary

This project aimed to carry out targeted surveillance sampling of retail food products for the Food Standards Agency (FSA) in order to help identify emerging food safety risks and increase the FSA's intelligence and insight of the UK food system. The outcomes inform FSA policy and science, and gather useful intelligence to inform official sampling undertaken by local and port health authorities.

This survey builds upon the success of a similar surveillance sampling programme was carried out in 2021-2022, during the pandemic.

The programme was delivered in partnership by the 3 Public Analyst Local Authority Official Food and Feed Laboratories (OLs) and the 2 private Public Analyst OLs in England and Wales.

Food samples were purchased across England and Wales from large Food Business Operators (FBOs) such as national supermarkets, smaller FBOs such as independent retailers and internet sites.

In total 32 different food commodities were sampled. Foods sampled were grouped into two sub-categories, those sampled as part of targeted surveillance and foods sampled as part of a basket of food approach. While both sub-categories contributed to the objectives outlined above, results from the targeted basket of food have additionally contributed to the FSA and Food Standards

Scotland (FSS) report Our Food: An annual review of food standards across the UK.

Products can be deemed non-compliant for a variety of reasons, many of which do not pose concern for human health. Samples were recorded as non-compliant in the following circumstances:

- detection of undeclared allergens
- presence of contaminants, such as mycotoxins and heavy metals, above permitted levels
- adulteration or substitution of products such as basmati rice, meat, fish, cheese and herbs
- composition of food tested not accurately presented in the food label
- food labels not complying with The Food Information Regulations 2014 or industry guidance

The FSA were informed immediately of any significant safety hazards, such as the presence of undeclared allergens and reports for all unsatisfactory samples were provided to the FSA in order for follow up action to be taken.

In total 998 samples were analysed by OLs for authenticity, presence of undeclared allergens, composition or contamination. There were 630 surveillance commodities of which 563 (89%) were reported as compliant by the public analysts with regards to the analysis undertaken and 368 basket of food samples of which 325 (88%) were compliant. The overall compliance rate was 89%. It should be noted sampling was targeted, with a focus on Food Business Operators (FBOs), deemed to be of higher risk and products more likely to be non-compliant. As such this overall compliance rate should not be viewed as being reflective of actual non-compliance in the UK market and samples taken from larger FBOs has a higher compliance rate.

In total, 107 samples reported as non-compliant were categorised. Within this survey sample failed for the following reasons:

- allergens
- contaminants
- unauthorised ingredient
- authenticity
- composition
- labelling

Within this survey, the highest number of failures were related to composition. Compositional analysis was carried out on 184 samples and 36 were reported as unsatisfactory in this respect by the Public Analysts. A total of 93 gin and vodka samples were analysed for alcohol content and 33% of premium/artisan gins and 17% of vodkas were outside the tolerances for declared alcohol strength, both above and below limits. Similarly, the fat content of 19% of the 31 milks tested were outside the permitted limits.

Allergen tests were carried out on 208 products (69 Surveillance Commodities and 139 Basket of Foods) and a significant proportion of samples (13%) had the presence of undeclared allergens detected. In particular, almost half of the soya lattes were found to have milk protein present, and around a quarter of bread products tested had allergens not declared on the label (in the majority of cases undeclared soya). All cases of undeclared allergens were reported without delay to the FSA.

Tests for contaminants included heavy metals and mycotoxins as well as the release of formaldehyde from food contact materials. None of the 240 samples tested for metals had levels above regulatory limits. Of the 250 spices and cereal products checked for the presence of mycotoxins, aflatoxins were reported above limits for a chilli and 2 ginger samples and Ochratoxin A in 2 turmeric and 3 chilli samples. A total of 2 products were reported with formaldehyde migration results above the limit.

In the UK some substances are not authorised for use in specific food products . Foods imported from another country must meet the same food standards as food produced in the UK. Of the 30 coloured cereal products sampled, 16% had colours that are not authorised within the food category and are thus non-compliant.

Authenticity testing was carried out on 278 samples including meats, spices, basmati rice, pasta, cheese and olive oil and 98% were reported as authentic. The main commodity with authenticity issues identified was basmati rice, with 17% of the basmati rice samples reported as having been adulterated with either non-basmati rice varieties or with a basmati rice different to the marked variety.

Food labels are a legal requirement and are crucial in delivering key information to consumers including ingredients, nutrition and allergy information so that they can make informed choices based on diet, allergies, personal / religious beliefs or cost. The Public Analysts identified 21 labelling irregularities which were mainly related to technical aspects of labelling and did not represent a specific public health issue. For example, issues with the readability of the font type used to provide allergen information and precautionary cross-contamination statements for consumers.

Collaborative working on this project has increased the flow of information between the OLs and the FSA and has bolstered the enforcement network, making stronger connections between national and local knowledge of the food supply chain. This project has clearly demonstrated that FSA and the OLs are fully capable of fostering the partnership working envisaged by Professor Elliott in his review into the integrity and assurance of food supply networks. (footnote 1) Outputs from the project will also support the FSA in acquiring and using data from food sampling as a source of intelligence and to test hypotheses, which was a benefit recognised in the National Audit Office report into ensuring food safety and standards. (footnote 2) This style of working is demonstrably aligned to the FSA future approach to sampling as endorsed by the FSA Board in November 2020.

1. Elliott review into the integrity and assurance of food supply networks: final report.

2. National Audit Office: Ensuring Food Safety and Standards

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Surveillance Sampling Programme - Introduction

Project Aim

To carry out targeted surveillance sampling on food products across England and Wales to help identify emerging food safety risks and increase the FSA’s intelligence on the food system.

Background

The aim of the FSA is to protect the public health from risks which may arise in connection with the consumption of food both in terms of how it is produced and supplied while making sure that “food is safe and what it says it is”.

During Covid-19 the FSA undertook a surveillance sampling programme targeting food products across England and Wales to help identify emerging food safety risks and increase the FSA’s intelligence on the food system. Building on the success of this programme a similar surveillance sampling programme was carried out in 2021-2022.

Using current intelligence including the pressures and issues in the global food chain and a co-ordinated approach with the 5 Official Laboratories in England and Wales a surveillance sampling programme was developed to enable the FSA to achieve the main objectives of protecting public health through identifying emerging food risks, providing assurance that food is what it says it is and taking appropriate action on non-compliant samples.

Official Food and Feed Laboratories (OLs)

The FSA are the Central Competent Authority responsible for designating food and feed official laboratories in the England, Wales and Northern Ireland according to the Multi-Annual National Control Plan (footnote 1), as required by the retained Official Feed and Food Control Regulations 2017/625 (footnote 2). The FSA has the responsibility for ensuring the United Kingdom has sufficient laboratory capacity and capability to deliver official controls on feed and food safety and standards in order to protect public health. Official Laboratories (OLs) are not owned or operated by the FSA.

There are currently 5 Public Analyst OLs in England and Wales:

- Hampshire Scientific Service
- Kent Scientific Services
- Lancashire County Scientific Services
- Minton Treharne and Davies Ltd
- Public Analyst Scientific Services

All OLs are accredited to ISO17025 by The United Kingdom Accreditation Service (UKAS) and employ suitably qualified staff including Public Analysts, Agricultural Analysts and Food Examiners for enforcement purposes.

1. Multi-Annual National Control Plan for the United Kingdom April 2019 to March 2023

2. Official Feed and Food Control Regulations 2017/625

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Surveillance Sampling Programme - Project Outline

Purpose and Scope

Based on FSA and OL intelligence a number of key sampling areas of interest were identified and developed into sampling and analysis groups. A range of means were used to identify commodities for sampling including FSA surveillance tools, horizon scanning and policy and scientific expertise.

A targeted shopping basket approach for sampling was also designed to run alongside this years targeted surveillance sampling programme. These commodities had been identified as frequently purchased foods for which there were known previous risks (such as authenticity issues) as well as some additional commonly consumed foods such as bread and milk and therefore important to have base line intelligence on.

The project aimed to provide representative surveillance across England and Wales. All samples were purchased by the OLs from businesses selling to the general public either in store or online.

The samples were divided between the OLs for analysis according to the analytical capabilities of each laboratory. Each OL used analytical methods that are routinely employed for enforcement purposes and reported the samples against appropriate legislation for the food product and the tests undertaken.

The HSS project team worked in partnership with the FSA throughout the project to respond to any emerging issues and allow the project scope to be reviewed as the wider food sampling landscape evolved.

Sampling Priorities

A total of 32 commodities were identified as sampling priorities. Of these, 19 were grouped as surveillance and 13 as basket of food commodities.

Surveillance Commodities

Table 1: Surveillance Commodities and Analysis

Commodity	Commodity Category	Hazard or area to be tested	Analysis
BBQ / marinaded single species meat	Meat	Authenticity	PCR for 7 species SQ banded (sheep, pork, beef, horse, goat, turkey & chicken)
Bio-based FCMs (melamine formaldehyde or alternatives incorporating bio material e.g. bamboo)	Food contact materials	Contaminants	Formaldehyde by acetic acid simulation followed by colourimetry
Black pepper	Herbs and spices	Authenticity Contaminants	Microscopy Aflatoxin by HPLC
Cereal product i.e. breakfast cereals	Grain	Contaminant: Unauthorised ingredient Composition	Colours quantitative by HPLC Melamine SPE/HPLC with UV detection Milk by ELISA Mycotoxins - DON & ZON by HPLC Cadmium by ICP
Chilli	Herbs and spices	Authenticity Contaminants	Microscopy Aflatoxin by HPLC Ochratoxin A by HPLC Sudan Dyes by HPLC
Salmon 50% composite, 50% salmon pieces	Meat	Authenticity	Fish species by PCR-RFLP. Salmon
Garlic powder/puree	Herbs and spices	Allergens	Peanut by ELISA

Commodity	Commodity Category	Hazard or area to be tested	Analysis
Ginger	Herbs and spices	Contaminants	Aflatoxin / Ochratoxin A by HPLC
Herbal supplements	Supplements	Contaminants	Metals testing by ICP or AAS
Paprika	Herbs and spices	Authenticity Contaminant	Microscopy Aflatoxin by HPLC Ochratoxin A by HPLC Sudan Dyes by HPLC
Premium / artisan Gin	Alcohol	Composition Contaminants	Alcohol / Methanol by GC
Leafy vegetables	Fresh produce	Contaminants	Lead, cadmium, mercury & arsenic by ICP or AAS
Quinoa	Grain	Contaminants	Cadmium and lead by ICP or AAS
Speciality meats (Goat, Game, exotic)	Meat	Authenticity	DNA Sequencing - all species including rare
Vodka	Alcohol	Composition Contaminants	Alcohol / Methanol by GC
Soya latte sampled directly from coffee shops	Free from	Allergens	Milk by ELISA
Wheat Flour	Grain	Allergens	Mustard by ELISA
Wheat products (wheat germ, durum wheat, rye grain, rye flakes)	Grain	Contaminants	Cadmium by ICP

Basket of Foods

Table 2: Basket of Food Commodities and Analysis

Commodity	Commodity Category	Hazard or area to be tested	Analysis
Basmati rice	Grain	Authenticity	Basmati varieties by PCR micro satellite
Bread	Grain	Allergens	Soya by ELISA Milk by ELISA Sesame by ELISA
Cheese	Dairy	Authenticity	Fat, fat in dry matter, milk fat (butyric acid) Species DNA by PCR
Dairy Free From	Free From	Allergens	Milk by ELISA
Gluten Free From	Free From	Allergens	Gluten by ELISA
Milk	Dairy	Composition	Fresh milk fat content
Olive oil	Oil	Authenticity	Extinction by solvent dissolution and UV, peroxide value by fat extraction, solvent dissolution and titrimetry, and fat profile by esterification and GC
Orange Juice	Soft drink	Composition	SO2, added colours, BRIX, Compliance against FIR
Oregano	Herbs & spices	Authenticity, Contaminants	Microscopy Aflatoxin by HPLC Metals by ICP or AAS Ochratoxin A by HPLC
Pasta	Grain	Authenticity	Non - Durum wheat - ELISA Determination of common wheat and durum wheat
Peanut free from	Free from	Allergens	Peanut by ELISA
Turmeric	Herbs & spices	Authenticity, Contaminants	Microscopy Aflatoxin by HPLC Ochratoxin A by HPLC Metals by ICP or AAS Artificial colours Lead chromate by ICP
Vegan products	Free from	Allergens	Milk by ELISA

Surveillance Sampling Programme - Method

Sampling

The informal purchasing of samples was carried out by OL staff who were provided with a shopping list and an area of the country in which to shop. In general single samples were purchased and this should be taken into consideration in the interpretation of the results.

All products were purchased at full cost from businesses selling to the general public and the food business operators (FBOs) were not notified that samples were being taken for subsequent testing. The sampling plan focussed on the range of products identified for this project and did not target specific businesses.

Geographic Distribution

The surveillance sampling was undertaken by OL staff with each OL identifying areas of England and Wales they could purchase samples. All samples were identified by postcode on a sampling map and areas of the country not covered by OL staff were targeted for on-line purchases where possible.

Retail Types

Representative surveillance was also achieved through sampling across a mix of FBOs. The project aim was to obtain approximately 25% of samples from large FBOs and 75% from smaller FBOs.

Large FBOs included mainstream supermarkets with national coverage or at least across multiple counties, or large food distributors. Smaller retailers included FBOs smaller than this, such as independent retailers, farm stores, stores operating under franchise, and self-service wholesale stores.

Some samples were purchased via the internet to reflect the consumer migration to on-line shopping and provide national coverage.

Duplication of Samples

Sampling was coordinated across all five OLs to minimise duplication. OLs were provided with a list of major supermarkets and national FBOs and were only allowed to sample from those specifically allocated to them.

A similar approach was taken with allocation of main brands for each sample type.

Sample Integrity

In order to ensure that surveillance samples were of a suitable standard for testing sampling information was provided for each food commodity/ hazard to ensure that sufficient sample was obtained and that samples were collected, transported and stored under appropriate conditions

so as not to adversely impact on the sample integrity or on the quality of the final analytical result.

Analysis

Each OL holds ISO17025 accreditation and used the most appropriate method for each commodity/hazard analysed using accredited methods if available. All the surveillance samples in this project were analysed using procedures used for official control samples and the integrity of the samples was maintained at all times with comprehensive records to demonstrate chain of custody.

Raw data for all samples including any replicate analysis, positive and negative controls and quality control materials were recorded and all records kept for a period of at least 12 months. The FSA were provided with photographs of packaging for all unsatisfactory samples as well as the final raw data.

In the event that a laboratory identified something that it considered to be non-compliant or a significant hazard to human health then the FSA were informed immediately.

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Surveillance Sampling Programme - Results

Table 3: Numbers of Samples Purchased and Analysed

Summary	Number
Total number of Products Sampled:	998
Basket of Food Samples:	368
Surveillance Commodity Samples:	630

Figure 1: Sample Distribution Map with Outcomes

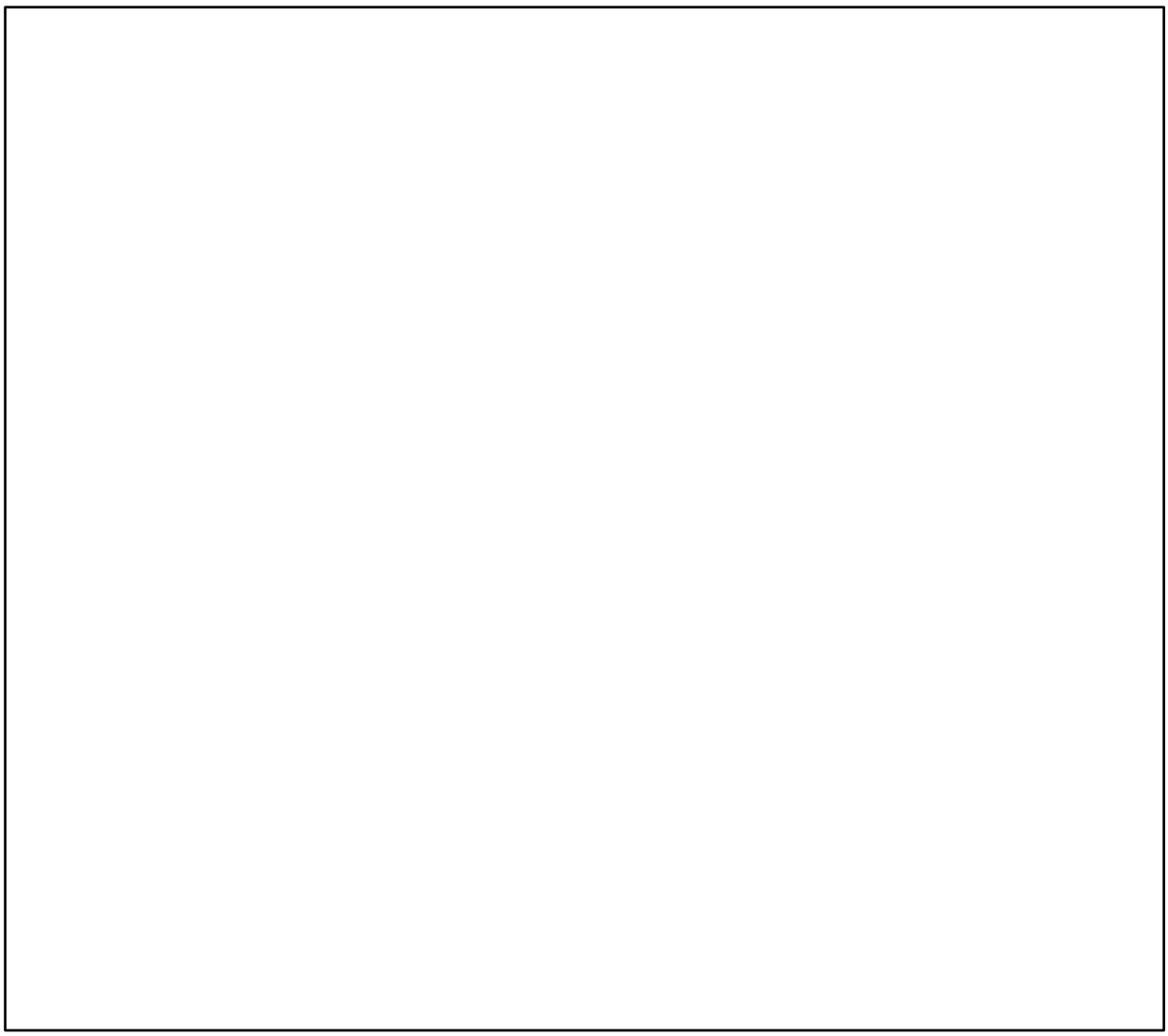
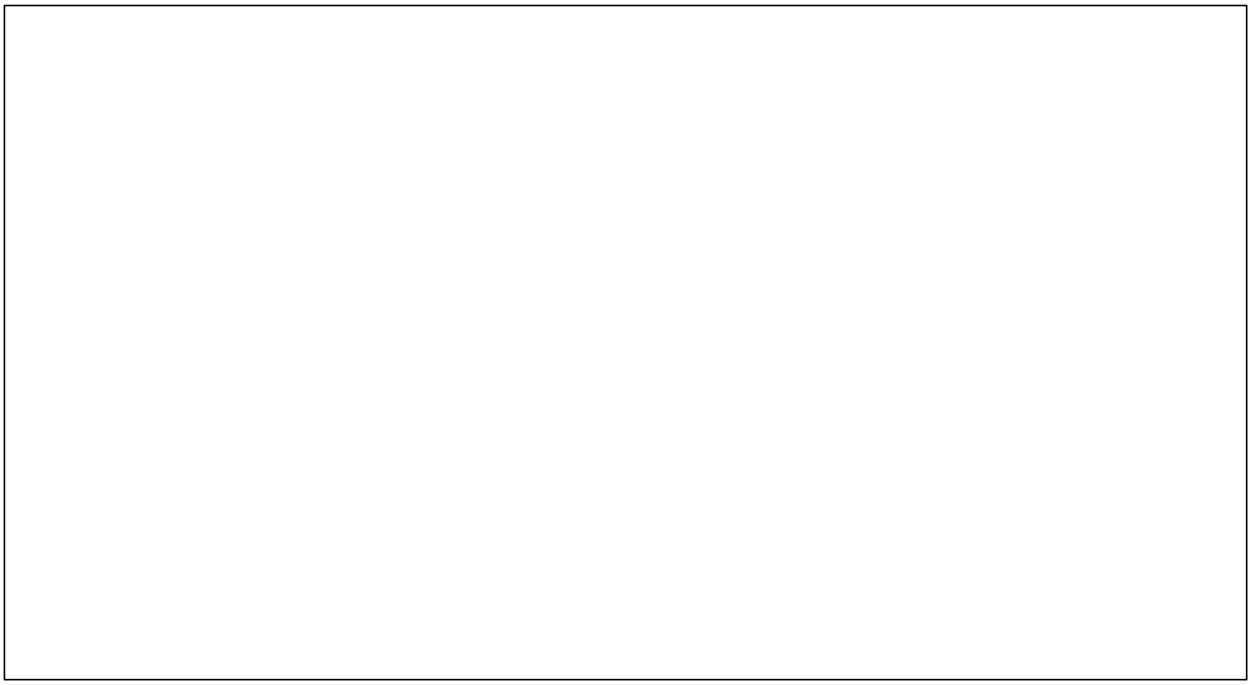


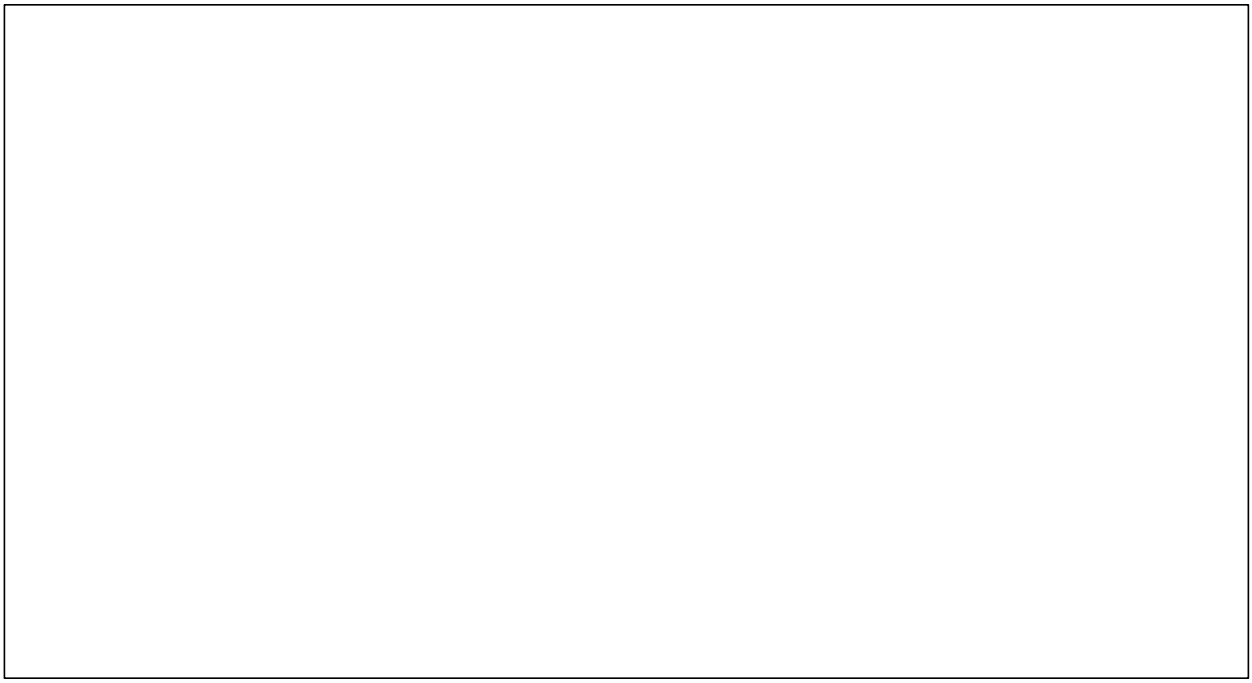
Figure 2: Summary of Surveillance Data



The graphic includes

- a distribution map showing the surveillance sampling coverage across England and Wales. There is a fairly even coverage across England and Wales.
- a table listing the retail outlets and the total number of surveillance samples taken from each, broken down as the number of compliant, non-compliant and inconclusive results. For example, of the 630 samples 324 were taken from small food business organisations, of which 282 were compliant. The full data is presented in table format (Table 6: Surveillance Commodities Compliance by Retail Outlet Type)
- a pie chart of the different categories of non-compliance for surveillance samples. For example, composition and allergens represented the two greatest categories of non-compliance, making up 37.88% and 31.82% respectively of all non-compliant surveillance samples. The full data is presented in table format (Table 5: Surveillance Commodities Non-compliance Categories)
- a stacked bar chart of the different surveillance commodities showing the number of compliant and non-compliant samples for each type. For example, Soya Latte is shown to have 16 compliant and 14 non-compliant outcomes, and Premium Gin is shown to have 41 compliant and 22 non-compliant outcomes. The full data is presented in table format (Table 4: Surveillance Commodities Sample Numbers and Compliance)

Figure 3: Summary of Basket of Foods Data



The graphic includes:

- a distribution map showing the basket sampling coverage across England and Wales. There is a fairly even coverage across England and Wales, with some denser areas of sampling in the areas closest to the laboratories.
- a table listing the retail outlets and the total number of basket samples taken from each, broken down as the number of compliant, non-compliant and inconclusive results. For example, of the 368 samples 187 were taken from small food business organisations, of which 163 were compliant, and 123 were taken from large food business organisations, of which 108 were compliant. The full data is presented in table format (Table 9: Basket of Foods Compliance by Retail Outlet Type).
- a pie chart of the different categories of non- compliance for basket samples. For example, Labelling and Composition represented the two greatest categories of non-compliance, making up 41.46% and 26.83% respectively of all non-compliant basket samples. The full

data is presented in table format (Table 8: Basket of Foods Non-compliance Categories)
- a stacked bar chart of the different basket commodities showing the number of compliant and non-compliant samples for each type. For example, bread is shown to have 18 compliant and 8 non-compliant outcomes. The full data is presented in table format (Table 7: Basket of Foods Sample Numbers and Compliance)

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Surveillance Sampling Programme - Discussion

Project Overview

The samples were purchased from a range of retail outlets with a view to represent the range of shopping habits. Of the samples purchased 61% were purchased from small FBOs (including refill / eco stores), 24% from large FBOs and 15% as online purchases.

Samples purchased from large FBOs including supermarkets and wholesalers showed the highest level of satisfactory in this survey. Approximately 1 in 7 samples purchased from smaller retailers were reported as unsatisfactory by the Public Analysts. On-line purchases were made from a range of small and large FBOs and their compliance rate reflects that of the in-person purchases described above.

The maps show there was a wide geographical spread of samples (Figure 2 and Figure 3) and no patterns of non-compliant hotspots were identified (Figure 1).

Satisfactory results were obtained for 888 of 998 samples (89%) tested with respect to the analyses carried out. In 3 instances samples were reported as inconclusive due to insufficient or denatured DNA extracted from the samples which meant that the tests could not be completed.

A total of 107 samples were reported as unsatisfactory and these were placed into the following categories:

- Allergens
- Contaminants
- Unauthorised ingredient
- Authenticity
- Composition
- Labelling

An overview of the results for each of these areas is provided in the following sections of this report.

Allergens

A total of 208 products were tested for the presence of allergens (69 from the surveillance commodity group and 139 from the basket of foods) and 180 of these (87%) were reported as satisfactory, i.e. allergens have not been detected.

Allergens in Surveillance Commodities

Soya Lattes

A total of 30 soya lattes were purchased from coffee shops by a sampler who informed the server they had both a dairy and a nut allergy. Samples were subsequently analysed for milk protein and almond protein.

Almond protein was not detected in any of the samples, however milk protein was detected in 14 samples (47% of total number analysed).

In 3 of the 14 samples found to contain milk protein, the levels were not considered sufficient to induce an adverse reaction in 99% of the milk allergic population.

The remaining 11 samples contained milk protein were considered to pose a risk to those with an allergy to milk.

Garlic Powder / Puree

A variety of garlic products were tested for the presence of peanut protein including powder (14), granules (7), minced/paste/purees (7) and salt (1).

Of the 29 samples tested, peanut protein was detected in 5 samples of garlic powder with levels ranging from 0.6 to >20 mg/kg. Packaged products accounted for 3 of the samples and 2 were from low environmental impact refill outlets.

There is a requirement for all pre-packed foods to declare the presence of allergens on the label to ensure that the consumer is aware of any potential risks. None of the samples had precautionary allergen labelling although the website of one of the low environmental impact outlets had the following website statement: "Please be aware that there are nut and gluten containing items in the store. We work hard to avoid cross contamination, but please consider your own needs when purchasing''. The website for the other retail outlet did not contain any allergen or cross-contact information and it is unknown if allergen notices were on display in the shops.

Cereal Products

Undeclared milk protein was tested for in 30 breakfast cereals with only 1 sample reporting milk protein at a concentration of 6.4 mg/kg.

Dairy Free From

The presence of undeclared milk protein was tested for in 29 products labelled as ‘dairy-free’. Milk protein was detected at a concentration of 21 mg/kg in a bar of 100% pure dark chocolate. The packaging had a voluntary cross contamination statement in relation to nuts but did not mention milk, it also bore the statement "Nothing else is added", in addition to an ingredient list listing cocoa beans as the single ingredient.

Allergens in Basket of Foods

Bread Products

A total of 26 bread products were tested for undeclared soya, milk or sesame. Soya was detected in 3 products at concentrations ranging from 5.6 to 543 mg/kg. In all instances the list of ingredients did not declare the presence of any soya derived ingredients nor did the labelling bear

a precautionary warning as to the presence of soya.

Undeclared milk protein was detected in 2 samples; a rye bread loaf contained 5.9 mg/kg and a sourdough loaf contained 0.3 mg/kg.

Undeclared sesame protein was detected in a sample of breadcrumbs at a level of 7 mg/kg.

Contaminants

A total of 521 products were tested for contaminants including mycotoxins (aflatoxins B1, B2, G1 and G2 and ochratoxin A), heavy metals (lead and cadmium) and methanol. Results were interpreted against the limits prescribed in the relevant legislation listed below:

The Contaminants in Food (England) Regulations 2013 (footnote 1)allow for the implementation of regulation (EU) No 1881/2006. These regulations prescribe maximum levels for mycotoxins and heavy metals and require analytical results to be corrected to take method recovery and uncertainty of measurement into account.

The Spirits Drinks Regulations 2008 (footnote 2) which implement regulation EU 2019/787, prescribe that the methanol content of vodka shall not exceed 10 grams per hectolitre of 100 % vol. alcohol. These regulations also state a maximum level for methanol of 5g per hectolitre (100L) of 100% vol alcohol permitted in a London gin.

The 521 tested samples were split between surveillance commodities (461) and basket of foods (60) and 510 (98%) were reported as satisfactory. A total of 240 samples were tested for the presence of heavy metals and all were found to be within regulatory limits.

Contaminants in Surveillance Commodities

Chilli

A total of 40 samples of chilli were tested for mycotoxins (aflatoxins B1, B2, G1 and G2 and ochratoxin A). All of the results were corrected for method recovery and uncertainty of measurement. Examples of unsatisfactory results include an extra hot chilli powder which had an aflatoxin B1 level of at least 2.1 times over the maximum permitted amount of 5.0 µg/kg and 3 samples (2 chilli powder and 1 ground chillies) which had Ochratoxin A levels above the 20 µg/kg permitted level.

Ginger

Mycotoxin levels were analysed in 40 samples of ginger to check whether they complied with the regulatory limits of 5.0 µg/kg and 10 µg/kg for aflatoxin B1 and total aflatoxin respectively. Examples of unsatisfactory results included two ground ginger samples which contained 7.1 µg/kg aflatoxin B1 and 16.1 µg/kg total aflatoxin and 12.9 µg/kg total aflatoxin respectively.

Vodka and Premium/Artisan Gin

A total of 93 samples of vodka and gin were tested for the presence of methanol.

A sample of vodka had a methanol level of 91.1 g/100L which is 9 times greater than the permitted level and a London gin sample contained 27 g/100L which is more than 5 times greater than the 5 g/100L permitted amount.

Food Contact Materials

A total of 28 food contact items, made from either melamine formaldehyde or plastic composites incorporating biomaterial such as bamboo, were tested for release of formaldehyde into food simulants. The range of products included mugs, plates, bowls, food boxes and cutlery.

Under retained Commission Regulation (EC) 284/2011 Article 3 and retained Commission Regulation (EU) No 10/2011, as enforced by the Plastic Kitchenware (conditions on Imports from China) (England) Regulations 2011 (footnote 3) and the Materials and Articles in Contact with Food (England) Regulations 2012, (footnote 4) melamine kitchenware originating from China or Hong Kong shall not release into foods or food simulants formaldehyde in a quantity exceeding 15 mg/kg.

Examples of unsatisfactory results included a set of three bamboo plastic composite bowls which were tested by exposure to acetic acid. The migration of formaldehyde into the third simulant ranged from 98.6 mg/kg to 110 mg/kg, exceeding the 15 mg/kg level for all three bowls. A set of three bamboo plastic composite tumblers were also tested and all three results were reported as higher than 259 mg/kg (results were above the highest calibration standard for the method).

Contaminants in Basket of Foods

Turmeric

Mycotoxin levels (aflatoxins B1, B2, G1 and G2 and ochratoxin A) were analysed in 30 samples of turmeric with two samples found to contain Ochratoxin A above the maximum permitted value of 15 µg/kg.

In addition, the samples were analysed for the presence of lead chromate and all were reported as satisfactory.

Unauthorised Ingredients

A total of 30 products from the surveillance category were tested for the presence of unauthorised ingredients including colours and Sudan dyes.

Sudan dyes are not permitted for colouring foodstuffs. Retained Regulation 1333/2008 of the European Parliament and of the Council of 16 December 2008 on food additives (8) contains a positive list listing all substances authorised as food additives; Sudan dyes are not mentioned in this list and are therefore strictly prohibited. No Sudan dyes were detected in the products.

Unauthorised Ingredients in Surveillance Commodities

Cereal Products

A variety of 30 cereal products (mainly breakfast cereals) were tested for the presence of food colours.

The Food Additives, Flavourings, Enzymes and Extraction Solvents (England) Regulations 2013 (footnote 5) which implement retained regulation (EU) no 1333/2008 do not permit the use of the colours allura red (E129), tartrazine (E102), brilliant blue (E133) nor sunset yellow (E110) in the food category breakfast cereals.

The labels of 5 samples declared the presence of red 40, blue 1 and yellow 6 which are the American names for allura red, brilliant blue and sunset yellow. In addition, 2 samples had labels declaring the presence of yellow 5 which is the American name for tartrazine. Subsequent analyses confirmed the presence of these non-permitted colours in the samples. All the unsatisfactory products in this category were packaged in America and imported into the UK.

Unauthorised Ingredients in Basket of Foods

No basket of food commodities required testing for unauthorised ingredients.

Authenticity

A total of 278 products were tested for authenticity with 142 coming from the surveillance group and 136 from the basket of foods). Analyses revealed 272 (98%) were satisfactory. All the samples tested in the following 5 commodity types were reported as satisfactory: durum wheat pasta, sheep / goats cheese, BBQ / marinated meat, black pepper and paprika. Unsatisfactory results for authenticity were reported for 3% of salmon samples for which results were obtained, 3% of speciality meat samples tested, 3% of oregano samples tested and 17% of basmati rice samples for which results were obtained. Inconclusive results were reported for 1 salmon sample, and 2 basmati rice samples due to it not being possible to extract sufficient DNA.

DNA techniques were used to test the authenticity of meat and fish species, cheese (from sheep and goat) and basmati rice. Durum wheat pasta was analysed using ELISA and spices were examined by microscopy.

Authenticity of Surveillance commodities

Salmon

A total of 30 products containing salmon such as fillets, fish cakes and fish pie mixes were tested for authenticity.

The Fish Labelling (England) Regulations 2013 (footnote 6) specify that the commercial designation "Atlantic Salmon" or "Salmon" is the name prescribed by law for the fish species Salmo Salar.

The unsatisfactory result was a fish pie mix. The ingredient list included "Salmon (Salmon Salar) (34%), Cod (Gadus morhua) (33%) and Smoked Haddock (Melanogrammus aeglefinus) (33%)"; however, analysis revealed the sample had a DNA profile consistent with Oncorhynchus mykiss (Rainbow Trout) and not salmon.

A salmon pate was reported as inconclusive as it was not possible to extract sufficient DNA due to the highly processed nature of the sample.

Speciality Meat

DNA sequencing was used to test the authenticity of 40 samples of game and exotic meats. Samples included venison, zebra, duck, kangaroo, ostrich, wild boar, partridge, pheasant, veal, goat, wood pigeon, duck and rabbit.

The only meat sample that was found to be misdescribed was a sample sold as “goat” which was identified by DNA sequencing as sheep (Ovis aries).

Authenticity of Basket of Foods

Basmati Rice

The rice varieties of 20 samples of rice labelled as basmati was checked using the detection of PCR micro satellite markers.

The Rice Association and British Retail Consortium Code of Practice on Basmati rice (footnote 7) states that when the description of the product is “Basmati rice”, the non-Basmati rice content must not exceed 7%. This tolerance is in place to take account of seed impurity and other segregation issues at origin.

Non-basmati varieties were detected in 3 samples of basmati rice with levels ranging from 20 to 30%. All of these samples failed to meet the requirements of the Code of Practice and were therefore deemed unsatisfactory.

Inconclusive results were reported for 2 samples as only degraded DNA was extracted meaning that no variety determination was possible.

Oregano

Microscopy was carried out on 14 samples of oregano to check for authenticity.

One sample was classed as inauthentic due to the presence of both oregano and olive leaf when the list of ingredients only stated oregano

Composition

A total of 184 products were tested for composition with 123 coming from the surveillance commodity group and 61 from the basket of foods). Of these 148 (80%) were reported as satisfactory. Unsatisfactory results were reported for 33% of gin samples tested , 13% of vodka samples tested, 7% of cereal products , 19% of milk samples , 13% of oregano samples and 3% of olive oil samples tested in respect to composition.

Composition of Surveillance commodities

Gin

A total of 63 premium/artisan gin samples were tested for methanol, and the level of alcohol to check that the amount of alcohol declared on the label was correct.

The minimum alcoholic strength by volume of gin is prescribed as 37.5% in regulation (EU) No 2019/787 implemented by The Spirit Drinks Regulations 2008. (footnote 8) The Food Information Regulations 2014 (footnote 9) permit a positive and negative tolerance of 0.3% vol in the indication of the alcoholic strength by volume of "other beverages" containing more than 1.2% by volume of alcohol.

A lower alcohol content than that declared on the label was found in 15 gin samples, with 13 of these having an alcoholic strength ranging from 0.1% to 3.9% less than the declared amount outside the permitted 0.3% alcohol by volume tolerance level. A sweet gin had an alcohol level 7.7% lower than the declared amount and an alcohol strength 34.7% which is less than the 37.5% minimum prescribed for gin. The highest discrepancy was found in a strawberry gin which had an alcoholic strength which was 12.7% lower than declared amount outside the permitted tolerance of 0.3% alcohol by volume. One of the samples with a percentage alcohol content below the declared abv was the same sample referenced in section 7.3.1.3 which contained methanol over the permitted limit.

In 6 samples the level of alcohol was higher than the amount declared. The difference between the amount of alcohol found and the amount declared, taking into account the uncertainty of measurement, ranged from 0.2% to 1.6% by volume.

Vodka

The levels of alcohol were tested in 30 vodka samples and compared with the declared amounts on the labels.

Lower amounts of alcohol compared to the label were found in 3 vodka samples and the discrepancies ranged from 0.1% to 0.7%.

Higher amounts of alcohol than declared were found in 2 samples with discrepancies of 0.4% and 2.7%. One of the samples with a percentage alcohol content below the declared abv was the same sample referenced in section 7.3.1.1 which had a methanol content over the permitted limit.

Cereal Products

Analysis of 30 cereal products for the presence of colours was carried out. The food regulation which relates to the presence of colours is quoted below:

The Food Additives Flavourings Enzymes and Extraction Solvents (England) Regulations 2013 (footnote 10) and Retained Regulation EC No 1333/2008 (footnote 11) has a maximum permitted level for sunset yellow (E110) of 35 mg/kg.

One of the cereal products returned an unsatisfactory result as the amount of sunset yellow contained within coloured sugar strands was found to be 100 mg/kg which exceeded the regulatory limit.

Composition of Basket of Foods

Milk

A total of 31 samples of milk including 19 whole milk samples and 12 semi-skimmed milk samples were tested for the percentage fat content.

Retained Regulation (EU) No 1308/2013 (footnote 12) requires that whole milk should have a minimum fat content of not less than 3.50% and semi-skimmed milk must have a fat content of not less than 1.50% and not more than 1.80%.

In three of the whole milk samples the fat content was found to be lower than the minimum fat content of 3.50% required by the regulations. In the case of one of these samples the label stated it had a fat content of 3.60 g/100ml however the analytical result was 3.43 g/100ml.

The fat content of one of the samples of semi-skimmed milk was declared as 1.70 g/100ml however the analytical result was 1.3% which was 0.2% below the minimum required and 0.4% below the declared amount. The fat contents of a further two samples of semi-skimmed milk were measured as 2.10 g/100ml and 1.92 g/100ml which were both greater than the maximum permitted by the Regulation.

Oregano

Microscopical examination was carried out to analyse the composition of 14 samples of oregano.

The guidance on authenticity of herbs and spices produced by the British Retail Consortium (BRC), the Food and Drink Federation (FDF) and the Spice Association (SSA) (footnote 13) gives a threshold of 2% for extraneous matter such as non-functional parts of the plants in herbs.

An example of an unsatisfactory result is extraneous plant material above the 2% threshold being observed. This was found in four samples with levels ranging from 5.8% to 14.7%. In one of these samples Alternaria mould spores were observed and it was noted that the label appeared to have the use by date cut off, in another 0.1586 g of foreign material were collected (equivalent to 6.1%

of the examined material) and in another a small fragment of foreign, mineral-like, material was observed.

Olive Oil

The compositions of 29 samples of olive oil were tested in this survey.

The Commission Regulation (EEC) No 2568/91 as enforced by the Olive Oil (Marketing Standards) Regulations 2014 (footnote 14) defines the characteristics to be fulfilled by olive oils.

Spectroscopic examination in the ultraviolet region is used as a means of checking the quality of an olive oil. Extinction coefficients (a measure of how strongly a species absorbs light at a specified wavelength) are calculated and provide information on the quality and preservation state of the oil. A higher extinction coefficient is indicative of oxidation processes having occurred in the oil.

One extra virgin olive oil sample was determined to have a specific extinction coefficient of 2.89 at a wavelength of 232 nanometers (nm) which was higher than the maximum permitted quality characteristic figure of 2.5, when taking into account the uncertainty of measurement which was 0.18 at the level of interest.

Labelling

Food labels were reviewed against the requirements of The Food Information Regulations 2014 (footnote 15) (which implement Regulation (EU) No 1169/2011) on the provision of food information to consumers and best practice guidance.

Labelling of Surveillance Commodities

There were 4 samples which were found to have labelling irregularities which are detailed below.

A wheat flour sample had a generic precautionary allergen labelling (PAL) statement which read "Due to the nature of our shop & the potential for cross contamination this product is not suitable for someone with allergies or intolerances". A PAL statement on prepacked foods should make specific reference to one or more of the 14 allergens regulated by UK food law that may be unintentionally present. Generic PAL statements on food unnecessarily limits food choice and could be considered misleading.

A gin sample had no indication of the alcoholic strength as required by the Food Information Regulations 2014. (footnote 16)

Two separate items in a set of bamboo cups labelled as suitable for use up to a maximum of 70 °C broke during test indicating that their temperature resistance was not as high as 70 °C. This sample was referred to the Office for Product Safety and Standards for follow up as it was not a food related issue and outside the scope of this survey.

A sample of garlic powder did not declare the net quantity of the foodstuff in the manner required by the Food Information Regulations 2014 (footnote 17) on the provision of food information to consumers.

Labelling of Basket of Foods

Labelling irregularities were identified in 17 samples. These irregularities were primarily due to issues with allergen labelling, with allergens not being correctly or suitably emphasised in line with the BRC Guidance on Allergen Labelling (footnote 18) and Food Information Regulations 2014.

This applied to a number of commodities including gluten free, peanut free, dairy free, bread and vegan products.

Other labelling irregularities were associated with the label format and, therefore, failed to meet the requirements of The Food Information Regulations 2014. (footnote 19) Examples include the nutritional panel not being in the correct format, the label being illegible, an incorrect list of compound ingredients and information not being written in English.

1. The Contaminants in Food (England) Regulations 2013
2. The Spirits Drinks Regulations 2008
3. Plastic Kitchenware (conditions on Imports from China) (England) Regulations 2011
4. The Materials and Articles in Contact with Food (England) Regulations 2012
5. The Food Additives, Flavourings, Enzymes and Extraction Solvents (England) Regulations 2013
6. The Fish Labelling (England) Regulations 2013
7. The Rice Association and British Retail Consortium Code of Practice on basmati rice
8. The Spirit Drinks Regulations 2008
9. The Food Information Regulations 2014
10. The Food Additives, Flavourings, Enzymes and Extraction Solvents (England) Regulations 2013
11. Regulation 1333/2008 of the European Parliament and of the Council of 16 December 2008 on food additives
12. Regulation (EU) No 1308/2013 of the European Parliament and of the Council of 17 December 2013 establishing a common organisation of the markets in agricultural products and repealing Council Regulations (EEC) No 922/72, (EEC) No 234/79, (EC) No 1037/2001 and (EC) No 1234/2007
13. The Guidance on authenticity of herbs and spices produced by the British Retail Consortium (BRC), the Food and Drink Federation (FDF) and the Spice Association (SSA)
14. Olive Oil (Marketing Standards) Regulations 2014
15. The Food Information Regulations 2014

16. The Food Information Regulations 2014

17. The Food Information Regulations 2014

18. British Retail Consortium Guidance on Allergen Labelling and the Requirements in Regulation 1169/2011

19. The Food Information Regulations 2014

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Surveillance Sampling Programme - Conclusion

Overall, satisfactory results with respect to the tests carried out were returned for 89% of samples.

Allergens

Consumers managing food allergies have to rely on products being correctly labelled to ensure that they do not suffer allergic reactions which can be severe and, in some cases, fatal.

A significant number of samples (13%) were found to have undeclared allergens at varying levels. In particular, milk protein was detected in almost 50% of soya lattes tested. Undeclared allergens, including milk, soya and sesame protein, were also detected in 23% of bread products tested.

All cases of undeclared allergens were dealt with as incidents and/or reported to the relevant local authorities for follow-up as determined most appropriate.

Contaminants

Contaminants are substances that have not been intentionally added to food but may be present through environmental contamination or as a result of one of the stages of production. They generally have a negative impact on the quality of the food and may also be a risk to health.

Heavy metals occur both naturally and as a result of human activity. Foods such as grains, spices and leafy vegetables absorb heavy metals from the environment. This survey tested 240 products for the presence of heavy metals and all returned satisfactory results.

Mycotoxins are naturally occurring toxic compounds that are produced by different types of fungi and can enter the food chain as a result of infection of crops such as cereals, spices and dried fruits. Out of the 250 products tested for mycotoxins, 3% were found to have levels above the regulatory limits.

Unauthorised Ingredients

Foods imported from another country must meet the same food standards as food produced in the UK. Of the cereal products sampled, 16% had colours that are not authorised within the food category for breakfast cereal and are thus non-complaint for the UK market.

Authenticity

It is important that consumers have trust in the food they buy and get what they pay for. Occasionally substituting premium products for cheaper alternatives can be an attractive option for businesses to make more money.

A total of 278 samples were tested for authenticity and 2% were found to be inauthentic. Basmati rice sells at a higher price than other rice varieties and 3 out of 20 basmati rice samples were reported as having been adulterated with either non-basmati rice varieties or with a basmati rice different to the marked variety.

The other non-authentic products included a salmon product substituted with trout, oregano with the addition of olive leaves and goat meat substituted with lamb.

Composition

As well as being authentic it is important that food matches its description so that the consumer can make informed choices.

The alcohol contents of 33% of the tested gins and 17% of the vodkas were outside the tolerances for the declared alcohol strength, both above and below the limits. Similarly, the fat content of 19% of milks tested were outside the permitted limits.
The compositions of 5 samples, 4 oregano and 1 olive oil were not of a quality that would be expected by the consumer.

Labelling

Food labels are a legal requirement and are crucial in delivering key information to consumers including ingredients, nutrition and allergy information so that they can make informed choices based on diet, allergies, personal / religious beliefs or cost.

More than 50% of the 21 labelling irregularities related to allergen information not being in line with the BRC Guidance on Allergen Labelling. (footnote 1) Standardisation of allergen labels ensures faster, easier and consistent relay of the important information of the substances or products causing allergies or intolerances added as an ingredient, to the relevant group(s) of sensitive individuals. Missing or incorrect information was reported on 4 labels and 6 were found not to be in the manner required by the regulations.

Retail Outlet Types

Compliance of food samples purchased from both large FBOs and online retailers was 92% and compliance of those purchased from small retail outlets was 87%. 1 in 7 samples bought from independent retailers were deemed as unsatisfactory by Public Analysts while from both large FBOs and online retailers this figure was 1 in 12.

1. British Retail Consortium Guidance on Allergen Labelling and the Requirements in Regulation 1169/2011

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