

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](#)