

FOOD SURVEY INFORMATION SHEET

October 2019

**A ROLLING PROGRAMME OF SURVEYS ON PROCESS
CONTAMINANTS IN UK RETAIL FOODS**

REPORT COVERING SAMPLING OF ACRYLAMIDE & FURAN 2018

Summary

- This Food Surveillance Information Sheet reports the results of acrylamide and furan levels in a range of UK retail foods obtained over the period January 2018-November 2018.
- The total number of retail products sampled during the survey was 275 and represented the food groups as specified in European Commission Recommendation [\(2010/307/EU\)](#)¹ on the monitoring of acrylamide in food. 275 products were analysed for acrylamide and 134 were analysed for furans, including 2-methyl furan and 3-methyl furan.
- This 2018 survey is the last year of a five-year sampling project. Data has been gathered annually since 2013 to monitor the levels of acrylamide and furans in UK retail products both to satisfy the requirements of the EC Recommendation and to inform policy decisions.
- In previous years, results were compared against 'indicative values' (IVs). European Commission Regulation (EU) [2017/2158](#)² establishing mitigation measures and 'benchmark levels' (BMLs) for the reduction of the presence of acrylamide in food came into force from 11 April 2018. This Regulation does not apply to foods manufactured prior to 11 April 2018. For simplicity, the acrylamide results for those UK retail foods sampled over the period January 2018 – 11 April 2018 were compared against IVs and products sampled afterwards were compared against BMLs.
- For UK retail foods obtained during the period January 2018 – 11 April 2018 the number of products found to contain acrylamide levels that exceeded the 'indicative value' (IV) for their food group was 5. These IV exceedances are based on the European Commission Recommendation [\(2013/647/EU\)](#)³. For UK retail foods obtained after 11 April 2018 the number of products found to contain acrylamide levels that exceeded the 'benchmark level' (BML) for their food group was 16. These BML exceedances are based on the European Commission Regulation (EU) [2017/2158](#).
- Where an acrylamide level has exceeded an IV or BML, the Food Standards Agency (FSA) has asked the relevant local authority to investigate with the Food Business Operator what action may have already been taken to limit acrylamide formation and to see whether further action is possible. However, an exceedance does not constitute an identified health risk or legislative non-compliance and no enforcement action is required.

¹ European Commission Recommendation on the monitoring of acrylamide levels in food [2010] OJ L137/8

² European Commission Regulation establishing mitigation measures and 'benchmark levels' for the reduction of the presence of acrylamide in food [2017] OJ L304/44

³ European Commission Recommendation on investigations into the levels of acrylamide in food [2013] OJ L301/17

- The results from this survey have been shared with the European Food Safety Authority (EFSA) for collation with other Member States' survey data to be used for any further trend analysis and exposure assessment across all European countries.

Background

1. Acrylamide and furans are chemical substances produced naturally when some foods are subjected to high temperatures during cooking (including home-cooking) and processing. In June 2015, EFSA published its first full [risk assessment](#) of acrylamide in food and reconfirmed previous evaluations that acrylamide in food potentially increases the risk of developing cancer for consumers in all age groups. In October 2017 EFSA published its [scientific opinion](#)⁴ on furan in food. EFSA concluded that the level of exposure to furans in food indicate a health concern.
2. In October 2016, COT published a risk assessment on acrylamide in the diet of infants and young children and concluded that exposures indicate a potential concern regarding the development of cancers. In February 2019 the COT published an overarching statement on chemicals in the diet of infants and young children, including furan and methylfurans, and concluded that the exposures to furan are of potential toxicological concern.⁵ The lack of occurrence data for methylfurans add to the uncertainties for the summed exposure and could therefore lead to an over- as well as underestimation of risk.
3. FSA and COT consider that exposure to these process contaminants should be as low as reasonably achievable (ALARA). To help try and achieve this goal and gain further information, the FSA is also working with the European Commission and stakeholders to gather data on their occurrence in foods and find ways to reduce consumer exposure to these naturally occurring process contaminants. In addition, the FSA is working to ensure the mitigation measures and best practices set out in European Commission Regulation 2017/2158 for the reduction of the presence of acrylamide in food are being implemented.

Acrylamide

4. Acrylamide is formed when foods containing the natural occurring amino acid asparagine and certain sugars are heated at temperatures greater than 120°C. Although acrylamide does not occur in such foods subjected to lower temperatures and relatively short process times e.g. boiled potatoes, it has been found in a wide range of home-cooked and processed foods, including potato crisps, French fries, bread, crisp breads and coffee.

⁴ European Food Safety Authority (EFSA) Journal 2017;15(10):5005

⁵ Based on data from the 2017 survey period as data from 2018 was not yet available.

5. In 2011 the European Commission and Member States agreed to establish [IVs](#)⁶ for acrylamide. Indicative values are intended as a trigger to initiate investigations by local authorities into food business operators' understanding of acrylamide and any action they have taken to mitigate its production. Exceedence of an 'IV' does not trigger enforcement action. In 2013 the indicative values previously introduced in 2011 were superseded by those in European Commission Recommendation [\(2013/647/EU\)](#).
6. European Commission Regulation (EU) [2017/2158](#) establishing mitigation measures and 'benchmark levels' for the reduction of the presence of acrylamide came into force from 11 April 2018. The Regulation makes it a requirement that for various foods, food business operators shall apply the relevant acrylamide mitigation measures listed in the Regulation and include them as part of their food safety management system. The Regulation also includes 'benchmark levels' for various foods which, like the 'indicative values' they supersede, are not maximum levels, rather performance indicators to verify the effectiveness of mitigation measures being taken by food business operators. Benchmark levels are set based on the ~85th percentile for broad food categories, therefore some foods may not be able to meet these levels. The purpose of the Regulation is to ensure, without unduly impacting upon any foods, that levels of acrylamide are as low as reasonably achievable (ALARA) for a given product, while still maintaining the products organoleptic and traditional characteristics. The Regulation does not apply to the acrylamide results for those UK retail foods obtained during the period January 2018 – 11 April 2018.
7. For some foods categories (10 and 11, Table 2) there are no benchmark levels (and nor were there indicative values), which were sampled to get a broader picture of acrylamide in the diet. For those categories with set levels, a comparison of the current benchmark levels and the indicative values they supersede is below:

⁶ European Commission Recommendation on investigations into the levels of acrylamide in food C(2010) 9681

Table 1 – Comparison of benchmark levels and indicative values

| Food | Indicative Value (µg/kg) (applicable until April 2018) | Benchmark Level (µg/kg) (applicable after April 2018) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------------------------------------------------------|
| French fries (ready-to-eat) | 600 | 500 |
| Potato crisps from fresh potatoes and from potato dough Potato-based crackers Other potato products from potato dough | 1000 | 750 |
| Soft bread Wheat based bread Soft bread other than wheat based bread | 80 150 | 50 100 |
| Breakfast cereals (excl. porridge) Bran products Wheat and rye based products Maize, oat, spelt, barley and rice based products | 400 300 200 | 300 300 150 |
| Biscuits and wafers Crackers with the exception of potato based crackers Crispbread Ginger bread Products similar to the other products in this category | 500 500 450 1000 500 | 350 400 350 800 300 |
| Roast coffee | 450 | 400 |
| Instant (soluble) coffee | 900 | 850 |
| Coffee substitutes Coffee substitutes mainly based on cereals Other coffee substitutes Coffee substitutes from a mixture of cereals and chicory Coffee substitutes exclusively from chicory | 2000 4000 - | 500 - * |
| Biscuits and rusks for infants and young children | 200 | 150 |
| Baby foods, other than processed cereal based foods Not containing prunes Containing prunes | 50 80 | - - |

| | | |
|------------------------------------------------------------------------------------------------------|----|----|
| Processed cereal based foods for infants and young children, excl. biscuits and rusks | 50 | - |
| Baby foods, processed cereal based foods for infants and young children excluding biscuits and rusks | - | 40 |

* The benchmark level to be applied to coffee substitutes from a mixture of cereals and chicory takes into account the relative proportion of these ingredients in the final product.

Furans

8. Furan and its methyl analogues such as 2-methyl furan, 3-methyl furan and 2,5-methylfuran are formed from the thermal degradation of sugars, oxidation of polyunsaturated fatty acids or the decomposition of ascorbic acid (vitamin C). They are found in a variety of products, including coffee, prefabricated potato snacks and canned and jarred products which, during processing, have been subjected to a high temperature heat treatment (e.g. roasting, frying, canning etc.).
9. Furan and its methyl analogues are highly volatile, however once formed as a result of the heat treatment, they cannot evaporate from processed food contained in an airtight sealed pack until the container is opened. Residual furans that may be present in the food after first opening the container may also evaporate over time, although the amount of furans lost will be dependent on the conditions of storage.

European Commission

10. This survey was conducted in response to two European Commission Recommendations for pan-European activity on process contaminants: (i) European Commission Recommendation [\(2010/307/EU\)](#)¹ to investigate the levels of acrylamide in food, and in particular to monitor the effectiveness of acrylamide reduction measures as specified in the FoodDrinkEurope toolbox and (ii) European Commission Recommendation [\(2007/196/EC\)](#)⁷, to monitor the occurrence levels of furan in foodstuffs.

EFSA

11. This acrylamide and furans data have been shared with the European Food Safety Authority (EFSA). EFSA collates the results with those from other Member States and uses these as the basis for ongoing risk and exposure assessments.

FSA Surveys

12. Information and results for all previous surveys can be accessed by clicking on the link: <https://www.food.gov.uk/search/research?keywords=acrylamide>

⁷ European Commission Recommendation on the monitoring of the presence of furan in foodstuffs [2007] OJ L88/56

Methodology

Sampling

13. A detailed sampling plan was agreed with the sampling contractor Sampling Sorbet (formerly Ventress Technical Limited) who undertook the purchase and collection of samples from a wide range of retail outlets including major and smaller supermarkets and independent retailers in the UK.
14. A total of 275 samples were purchased to cover the food groups in line with European Commission Recommendation (EU) No. 2010/307.

Analysis

15. The analytical contractor, Premier Analytical Services (PAS) worked closely with Sampling Sorbet to arrange the transfer of 275 samples to the laboratory and ensure sample integrity. Full details of all analytical methods and procedures carried out by PAS, including analytical quality assurance, can be found in the accompanying contractor's report.

Results

16. A total of 275 samples were received by PAS over the period January 2018 – November 2018 for the analysis of acrylamide and furans.
17. Samples identified for home-cooking were cooked according to manufacturers' instructions prior to analysis. As furan and its methyl analogues such as 2-methyl furan and 3-methyl furan are highly volatile, samples requiring furans analysis were tested as received and as consumed to allow for any losses during preparation.

Acrylamide

A total of 275 samples were analysed for acrylamide. A summary of the acrylamide concentrations (mean and range) by food category is shown in Table 2.

Table 2 - Summary of acrylamide concentrations in each food category/sub-category

| Food category ^a | Sub category ^a | Description | Sampling date | n | Acrylamide (µg/kg) | | | | | | n>I V ^c | n>BM L ^d |
|----------------------------|---------------------------|------------------------------------------------|---------------|-----------|--------------------|-----------|------------|-------------|------|------|--------------------|---------------------|
| | | | | | mean | min | max | SE | IV | BM L | | |
| 1 | - | French fries sold as ready to eat | 2018 | 30 | 200 | 12 | 623 | 26.9 | - | - | - | - |
| | 1.1 | French fries from fresh potatoes ^b | Mar | 15 | 189 | 47 | 623 | 34.5 | 600 | - | 1 | - |
| | | | Nov | 15 | 211 | 12 | 540 | 42.2 | - | 500 | - | 1 |
| 2 | - | Potato crisps and potato-based crackers | 2018 | 20 | 621 | 33 | 997 | 70.2 | - | - | - | - |
| | 2.1 | Potato crisp from fresh potatoes ^b | Mar | 5 | 793 | 503 | 973 | 95.3 | 1000 | - | 0 | - |
| | | | Nov | 5 | 533 | 253 | 629 | 70.4 | - | 750 | - | 0 |
| | 2.2 | Potato crisp from potato dough | 2018 | 5 | 742 | 382 | 994 | 105 | - | 750 | - | 3 |
| | 2.3 | Unspecified potato crisps | 2018 | 5 | 416 | 33 | 997 | 212 | - | 750 | - | 2 |
| 4 | - | Soft bread | 2018 | 40 | 17 | 3 | 76 | 2.5 | - | - | - | - |

| | | | | | | | | | | | | |
|----------|-----|--------------------------------------------------------------------------------|-------------|-----------|------------|-----------|-------------|-------------|-----|-----|---|---|
| | 4.1 | Wheat based bread | - | 28 | 18 | 3 | 76 | 3.4 | 80 | - | 0 | - |
| | 4.2 | Soft bread other than wheat-based bread | - | 12 | 17 | 4 | 41 | 3.2 | 150 | - | 0 | - |
| 5 | - | Breakfast cereals (excluding porridge) | 2018 | 32 | 184 | 4 | 808 | 33.9 | - | - | - | - |
| | 5.1 | Maize, oat, spelt, barley and rice-based products | - | 14 | 129 | 4 | 808 | 54.2 | 200 | - | 1 | - |
| | 5.3 | Bran products and whole grain cereals, gun puffed grain | - | 18 | 227 | 17 | 634 | 41.5 | 400 | - | 3 | - |
| 6 | - | Biscuits, crackers, crisp bread and similar (excluding pastry and cake) | 2018 | 32 | 223 | 13 | 1321 | 44.0 | - | - | - | - |
| | 6.1 | Crackers with the exception of potato-based crackers | - | 6 | 210 | 50 | 474 | 70.6 | - | 400 | - | 1 |
| | 6.2 | Crisp bread | - | 6 | 194 | 13 | 320 | 51.6 | - | 350 | - | 0 |
| | 6.3 | Biscuits and wafers | - | 14 | 287 | 25 | 1321 | 91.9 | - | 350 | - | 2 |

| | | | | | | | | | | | | |
|----------|-----|------------------------------------------------------------|-------------|-----------|------------|------------|-------------|-------------|---|----------------|---|---|
| | 6.4 | Gingerbread | - | 2 | 87 | 71 | 103 | 16.1 | - | 800 | - | 0 |
| | 6.5 | Products similar to the other products in this category | - | 4 | 134 | 56 | 244 | 45.4 | - | 300 | - | 0 |
| 7 | - | Coffee and coffee substitutes | 2018 | 12 | 577 | 227 | 1249 | 87.8 | - | - | - | - |
| | 7.1 | Roasted coffee (dry) | - | 4 | 253 | 227 | 273 | 10.2 | - | 400 | - | 0 |
| | 7.2 | Instant coffee (dry) | - | 6 | 702 | 609 | 856 | 33.7 | - | 850 | - | 1 |
| | 7.3 | Substitute coffee (dry) mainly based on cereals | - | 2 | 847 | 445 | 1249 | - | - | - ^e | - | - |
| 8 | - | Baby foods, other than processed cereal based foods | 2018 | 32 | 20 | 5 | 71 | 2.6 | - | - | - | - |
| | 8.1 | Baby foods not containing prunes | - | 30 | 19 | 5 | 71 | 2.6 | - | 40 | - | 2 |
| | 8.2 | Baby foods, containing prunes | - | 2 | 25 | 16 | 35 | - | - | 40 | - | 0 |
| 9 | - | Processed cereal-based foods for | 2018 | 33 | 48 | 0 | 292 | 12.9 | - | - | - | - |

| | | | | | | | | | | | | |
|-----------|----------|---------------------------------------------------------------------|-------------|-----------|------------|----------|------------|-------------|----------|----------|----------|----------|
| | | infants and young children | | | | | | | | | | |
| | 9.1 | Biscuits and rusks for infants and young children | - | 15 | 98 | 9 | 292 | 22.5 | - | 150 | - | 4 |
| | 9.2 | Other processed cereal-based foods for infants and young children | - | 18 | 7 | 0 | 17 | 0.9 | - | 40 | - | 0 |
| 10 | - | Other products, based on cereals, potatoes, cocoa and coffee | 2018 | 28 | 125 | 5 | 356 | 18.7 | - | - | - | - |
| | 10.2 | Cake and pastry | - | 6 | 67 | 5 | 191 | 28.0 | - | - | - | - |
| | 10.3 | Savoury snacks | - | 5 | 153 | 72 | 268 | 33.7 | - | - | - | - |
| | 10.4 | Other products, based on cereals | - | 9 | 122 | 7 | 326 | 40.6 | - | - | - | - |
| | 10.5 | Other products, based on potatoes | | 2 | 170 | 164 | 176 | - | - | - | - | - |
| | 10.6 | Other products, based on cocoa | - | 6 | 148 | 20 | 356 | 47.1 | - | - | - | - |

| | | | 2018 | 1 6 | 297 | 7 | 1329 | 92. 0 | - | - | - | - |
|----|---|-------------------------------------------------------------------------|------|--------|------|----------|------|----------|---|---|---|---|
| 11 | - | Other products, not based on cereals, potatoes, cocoa and coffee | | | | | | | | | | |
| | - | Battered / bread crumbed fish | - | 2 | 7 | 7 | 8 | - | - | - | - | - |
| | - | Canned / jarred black olives | - | 2 | 366 | 340 | 392 | - | - | - | - | - |
| | - | Canned prunes | - | 2 | 212 | 70 | 355 | - | - | - | - | - |
| | - | Chips / crisps, mixed vegetables | - | 2 | 1165 | 100 2 | 1329 | - | - | - | - | - |
| | - | Chips / crisps, plantain | - | 2 | 228 | 163 | 294 | - | - | - | - | - |
| | - | Dried fruit (dark) | - | 2 | 38 | 26 | 50 | - | - | - | - | - |
| | - | Liquorice | - | 2 | 111 | 108 | 114 | - | - | - | - | - |
| | - | Sweet potato fries sold as ready-to-eat | - | 2 | 249 | 177 | 320 | - | - | - | - | - |

^a according to EFSA⁸; ^b products prepared from seasonal potatoes; ^c EC Indicative Values⁹; ^d EC Benchmark Levels¹⁰; ^e Level dependent upon relative proportions of cereals and chicory in the products (not given on packs).

Furans

18. A total of 134 samples were analysed for furans. A summary of the furans concentrations (mean and range) by product category is shown in Table 3, Table 4 and Table 5.

Table 3 - Summary of furan concentrations (mean and range) as received / consumed by food category

| Survey category | Description | Sampling date | n | Furan (µg/kg) ^a | | | |
|-----------------|--------------------------------------------------------------------------------|---------------|----|----------------------------|------|------|-------|
| | | | | Mean | min | max | SE |
| 5 | Breakfast cereals (excluding porridge) | 2018 | 32 | 23 | 0 | 94 | 4.5 |
| 6 | Biscuits, crackers, crisp bread and similar (excluding pastry and cake) | 2018 | 32 | 28 | 0 | 152 | 6.4 |
| 7 | Coffee and coffee substitutes | 2018 | 12 | 1159 | 70 | 4139 | 391.6 |
| | Coffee and coffee substitutes, as consumed | 2018 | 12 | 22 | 2 | 120 | 11.1 |
| | Roast | 2018 | 4 | 2787 | 1809 | 4139 | 584.2 |
| | Roast, as consumed | 2018 | 4 | 58 | 6 | 120 | 26.3 |
| | Instant | 2018 | 6 | 422 | 165 | 599 | 60.2 |
| | Instant, as consumed | 2018 | 6 | 4 | 2 | 5 | 0.5 |
| | Other | 2018 | 2 | 116 | 70 | 161 | - |
| | Other, as consumed | 2018 | 2 | 2 | 2 | 3 | - |

⁸ EFSA (European Food Safety Authority), 2017. Specific reporting requirements for contaminants and food additives occurrence data submission in SSD2. EFSA supporting publication 2017:EN-1261. 43 pp. doi:10.2903/sp.efsa.2017.EN-1261.

⁹ Commission Recommendation of 8 November 2013 on investigations into the levels of acrylamide in food (2013/647/EU), oj L 301, 15-17, 12.11.13

¹⁰ Commission Regulation (EU) 2017/2158 of 20 November 2017 establishing mitigation measures and benchmark levels for the reduction of the presence of acrylamide in food

| | | | | | | | |
|----|-------------------------------------------------------------------------|-------------|-----------|-----------|----------|-----------|------------|
| 8 | Baby foods, other than processed cereal based foods | 2018 | 32 | 36 | 5 | 94 | 3.3 |
| 9 | Processed cereal-based foods for infants and young children | 2018 | 10 | 6 | 0 | 17 | 1.7 |
| 11 | Other products, not based on cereals, potatoes, cocoa and coffee | 2018 | 4 | 11 | 5 | 16 | 2.3 |
| | Canned / Jarred olives | 2018 | 2 | 13 | 9 | 16 | - |
| | Canned prunes | 2018 | 2 | 9 | 5 | 13 | - |

^aLower bound concentrations (values < LOD = 0)

Table 4 - Summary of 2-methyl furan concentrations (mean and range) as received / consumed by food category

| Survey category | Description | Sampling date | n | 2-methyl furan ($\mu\text{g}/\text{kg}$) ^a | | | |
|-----------------|--------------------------------------------------------------------------------|---------------|----|---------------------------------------------------------|------|--------------------|--------|
| | | | | Mean | min | max | SE |
| 5 | Breakfast cereals (excluding porridge) | 2018 | 32 | 18 | 0 | 70 | 3.3 |
| 6 | Biscuits, crackers, crisp bread and similar (excluding pastry and cake) | 2018 | 32 | 26 | 2 | 137 | 5.6 |
| 7 | Coffee and coffee substitutes | 2018 | 12 | 4898 ^{b,c} | 77 | 18129 ^b | 1847.6 |
| | Coffee and coffee substitutes, as consumed | 2018 | 12 | 62 | 1 | 382 | 33.8 |
| | Roast | 2018 | 4 | 12281 ^{b,c} | 6751 | 18129 ^b | 3147.8 |
| | Roast, as consumed | 2018 | 4 | 170 | 22 | 382 | 82.1 |
| | Instant | 2018 | 6 | 1554 | 602 | 2375 | 241.4 |
| | Instant, as consumed | 2018 | 6 | 10 | 4 | 17 | 1.8 |
| | Other | 2018 | 2 | 164 | 77 | 251 | - |
| | Other, as consumed | 2018 | 2 | 2 | 1 | 3 | - |
| 8 | Baby foods, other than processed cereal based foods | 2018 | 32 | 4 | 0 | 11 | 0.4 |
| 9 | Processed cereal-based foods for infants and young children | 2018 | 10 | 4 | 1 | 16 | 1.5 |
| 11 | Other products, not based on cereals, potatoes, cocoa and coffee | 2018 | 4 | 3 | 0 | 7 | 1.6 |

| | | | | | | |
|------------------------|------|---|---|---|---|---|
| Canned / Jarred olives | 2018 | 2 | 6 | 4 | 7 | - |
| Canned prunes | 2018 | 2 | 1 | 0 | 1 | - |

^a Lower bound concentrations (values < LOD = 0); ^b extrapolated value(s) in excess of upper calibration limit; ^c semi-quantitative value - spike recovery on roast coffee below expected level. "Extrapolated values" refers to method by which the values given were estimated, i.e. by linear extrapolation of the calibration data set (which is a standard mathematical procedure for estimating values beyond an observational range).

Table 5 - Summary of 3-methyl furan concentrations (mean and range) as received / consumed by food category

| Survey category | Description | Sampling date | n | 3-methyl furan ($\mu\text{g}/\text{kg}$) ^a | | | |
|-----------------|--------------------------------------------------------------------------------|---------------|----|---------------------------------------------------------|-----|-----|------|
| | | | | Mean | min | max | SE |
| 5 | Breakfast cereals (excluding porridge) | 2018 | 32 | 0 | 0 | 0 | 0 |
| 6 | Biscuits, crackers, crisp bread and similar (excluding pastry and cake) | 2018 | 32 | 2 | 0 | 15 | 3.7 |
| 7 | Coffee and coffee substitutes | 2018 | 12 | 213 | 24 | 652 | 64.8 |
| | Coffee and coffee substitutes, as consumed | 2018 | 12 | 2 | 0 | 16 | 1.4 |
| | Roast | 2018 | 4 | 480 | 303 | 652 | 99.6 |
| | Roast, as consumed | 2018 | 4 | 7 | 1 | 16 | 3.4 |
| | Instant | 2018 | 6 | 98 | 73 | 125 | 7.24 |
| | Instant, as consumed | 2018 | 6 | 0 | 0 | 1 | 0.1 |
| | Other | 2018 | 2 | 26 | 24 | 28 | - |
| | Other, as consumed | 2018 | 2 | 0 | 0 | 0 | - |
| 8 | Baby foods, other than processed cereal based foods | 2018 | 32 | 3 | 0 | 10 | 0.43 |
| 9 | Other products, based on cereals, potatoes, cocoa and coffee | 2018 | 10 | 1 | 0 | 4 | 0.4 |
| 11 | Other products, not based on cereals, potatoes, cocoa and coffee | 2018 | 4 | 5 | 2 | 9 | 2 |
| | Canned / Jarred olives | 2018 | 2 | 9 | 8 | 9 | - |
| | Canned prunes | 2018 | 2 | 2 | 2 | 2 | - |

^a Lower bound concentrations (values < LOD = 0)

19. All brand owners have received their own results and have been given the opportunity to comment. Comments received are reported in Annex. Individual analytical results for each product and category including brand names, batch numbers and best before dates, (where available), can be found in the accompanying contractor's report.

Conclusion

20. The acrylamide and furans results obtained in this sampling year do not increase our concern about the risk to human health. Under the new legislation, food businesses are required to incorporate the relevant acrylamide mitigation measures developed by the food industry into their food safety management systems. Businesses are also expected to undertake representative sampling and analysis where appropriate to monitor the levels of acrylamide in their products. More information on the new acrylamide legislation is available [on the FSA website](#). While some results of the 2018 survey were in exceedance of the benchmark levels set out in legislation, these levels are lower than the indicative values which they supersede. Additionally, it takes time for changes to be made to the production process and some foods may not be able to meet the levels set out in the legislation as the benchmark levels are based on the 85th percentile of broad food categories.
21. Unlike acrylamide, furans are highly volatile and levels in some processed foods can be minimised by heating and stirring the contents of canned and jarred foods in an open saucepan. Packets and pouches that are repeatedly opened and closed during use will also help reduce levels of furans during the shelf life of the product. Furans will also naturally evaporate from hot beverages in an open container. Following the recent EFSA opinion on furan the European Commission and Member States are considering whether further risk management action is appropriate. The COT recommends that efforts to reduce furan and methylfurans should continue, with respect to commercially produced food, and monitoring should be continued to allow for future accurate risk assessments.
22. This survey gives a 'snapshot' of the range of levels of acrylamide and furans that may be expected in different types of products on sale in the UK during the 2018 sampling period. While the survey results may provide an indication of the levels of acrylamide and furans that consumers may typically be exposed to in certain foods, levels of these process contaminants, even in different brands of the same food, can vary depending on raw materials used by the manufacturer and processing conditions. It is therefore not possible to be able to draw definitive conclusions for individual brands sampled.
23. For the 2018 sampling year of the multiannual survey some changes were made to the sampling plan. The number of samples taken for categories for which sufficient data had been collected (such as 'pre-cooked French fries for home cooking') was reduced, and additional samples were taken for other categories, including some products not covered by the monitoring Recommendation, in order to get a broader picture of acrylamide in the diet. For the categories which had been sampled in earlier years, every effort was made to ensure that products to be sampled matched those as sampled previously with regard to brand and retailer. This was not always possible, however, therefore substitute products were sampled where necessary. For these reasons the 2018 sampling plan was not exactly the same in terms of brands sampled and the number of samples analysed when compared to the earlier FSA acrylamide and furan surveys.

Summary of Units

microgram (μg): one thousandth of a milligram (mg)

gram (g): one thousandth of a kilogram (kg)

kilogram (kg): one thousand gram

$\mu\text{g}/\text{kg}$: microgram per kilogram

Further information

Further information on this survey can be obtained from:

Izaak Fryer-Kanssen

Food Policy

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Clive House

70 Petty France

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Annex - Comments from Brand Owners

Bickiepegs Healthcare Ltd.

'We acknowledge and accept the FSA's finding of acrylamide in our product. Our own analysis of this batch also undertaken by the same independent laboratory indicated a similar level. We accept the product on that occasion slightly exceeded the EFSA indicative guidelines for this category 'Biscuits for children and young infants.'

We have been investigating acrylamide mitigation measures for the past 18 months and have taken steps to significantly reduce levels in our product. It is unfortunate that the FSA sample was taken before our investigations concluded and our trial measures were introduced commercially. As a result of changes to the baking process and the introduction of a food grade enzyme designed to reduce acrylamide production in baking, levels are now well below guideline levels.'

Fairfields Farm Produce Ltd.

'We at Fairfields Farm Produce Ltd acknowledge that the results of this round of testing demonstrate that we are meeting both the indicative values under Commission Recommendation 2013/647/EU and the now current benchmark levels set out in EU regulation 2017/2158.

We are applying the mitigation measures as detailed in the EDF toolbox and EU regulation 2017/2158 to ensure that Acrylamide levels are as low as reasonably practicable by: -

- Selecting specific potato varieties low in acrylamide precursors*
- Storing potatoes in a temperature-controlled environment*
- Monitoring and recording the levels of reducing sugars in stored potatoes*
- Ensuring that fry temperatures are as low as reasonably possible and exit temperatures do not exceed 168°C*
- Moisture levels are a minimum of 1%*
- Colour sorting crisps post-fry*

We continue to monitor and record the levels of acrylamide in our potato crisps to ensure that the mitigation measures remain effective and our crisps remain compliant with EU Regulation 2017/2158.'