ACRYLAMIDE LEVELS IN FOOD: PASSING THE HOT POTATO

Sum Of + Us

This is a SumOfUs report based on analysis conducted by Changing Markets on acrylamide data found in foodstuffs as reported by Member States to the European Food Safety Authority (EFSA). These data were released to Changing Markets by EFSA in October 2016 following an access to documents request.

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EXECUTIVE SUMMARY

This report analyses the information released by the European Food Safety Agency (EFSA) on the levels of acrylamide, a carcinogenic chemical, found in many day-to-day foods such as bread, coffee, biscuits, crisps and baby foods consumed in Europe. It also looks at the measures that business operators in the agricultural, manufacturing and hospitality sectors can implement across the food chain to prevent the formation of acrylamide. It concludes with a set of recommendations to improve the legislative proposal currently under discussion in the European Union to regulate the presence of acrylamide in food to provide sufficient protection to consumers.

Contaminants are toxic substances that have not been intentionally added to food. These substances may be present as a result of the packaging, handling and distribution processes, environmental contamination, or as in the case of acrylamide, a result of food production. Acrylamide forms when starchy food products are heated up - typically during cooking - at high temperatures and under low moisture conditions.

The presence of acrylamide in food cannot be fully eliminated. However, robust legislation and the application of best practice by food business operators can significantly reduce its levels in food. The European food industry has developed a number of versions of a "toolbox" outlining possible voluntary interventions for reducing acrylamide in food since 2006[1]. In parallel, the European Commission (EC) has put in place non legally -binding recommendations for Member States to regularly test levels of acrylamide present in food as a way of monitoring the application of these measures through a harmonised sampling program.

Moreover, the EC has set a range of indicative values for the levels of acrylamide present in different food groups. These are intended to serve as a benchmark to assess the extent to which the Codes of Practice have been applied. However, a major review published by the European Food Safety Agency (EFSA) in 2015[2] showed that the voluntary measures had not led to a reduction in the level of acrylamide found across food groups other than potato crisps.

The analysis of acrylamide levels found in foodstuffs on the European market presented here includes newly released EFSA data for the period between 2013-2014[3]. The results confirm that the current approach, which relies on the voluntary application of the codes of practice by the industry, has not led to a reduction in acrylamide levels found in foods. In addition, it does not provide sufficient protection to consumers, as food samples found to contain acrylamide at levels many times greater than the EC's benchmark continue to be placed on the market.

Finally, the Commission has put forward a proposal that would essentially extend this failed approach by making the *application* of the code of practice mandatory while failing to set enforceable legally-binding limits for acrylamide in line with achievable reductions. The report ends with recommendations as to how the proposal can be strengthened in a way that will lead to a significant reduction of acrylamide levels in food sold in Europe.

Key findings:

- **There continues to be no substantial trend across food groups towards lower levels of acrylamide. While trend analysis across major food categories suggests a slight downward trend for acrylamide levels in potato crisps and snacks, crisp bread, biscuits and crackers, acrylamide levels in French fries, gingerbread and roasted coffee suggest concentrations are unchanged or increasing;**

- **A very significant proportion of food products placed on the market (2,200 or 12% of the total) presented unacceptably high levels of acrylamide above the current benchmark set by the European Commission[4]. The percentage of food samples above the benchmark levels was similar for food samples produced outside and within the European Economic Area;**

- **The highest acrylamide concentrations at 38,000 and 7,900 µg/Kg were found in a sample of instant coffee in Belgium and a sample of French fries in Denmark. These are 42 and 13 times higher than the current EC benchmark for these products;**

- **The highest acrylamide concentrations for food products targeted at babies were 1905, 1508 and 582 µg/Kg. These were found in samples of baby rusks, baby foods and in processed cereal baby products taken in Germany, UK and the Czech Republic respectively. These levels are 10, 30 and 12 times higher than the current EC benchmarks for these products. In 2014, 12% and 28% of baby foods and processed cereal foods for infants respectively exceeded the EC benchmark;**

- **The countries with the largest percentage of samples with levels of acrylamide above the current EC benchmark were: Greece (75%), Estonia and Sweden (20%), Belgium and Ireland (18%), Italy (17%), Norway (16%), Austria (15%), Spain and Finland (14%).**

1. INTRODUCTION

In 2002, Swedish scientists made a significant discovery when they found that acrylamide, a chemical in tobacco smoke and used in industrial processes such as water treatment and papermaking, was present in everyday foods[5] including bread, French fries, crisps and other potato snacks, coffee, cocoa products, biscuits, breakfast cereals and baby foods.

The presence of acrylamide, a probable carcinogen, is of concern because it is prevalent in many staple foods. For example, the average European consumes between 40-140 kg of potatoes[6], 50 kg of bread and pastries[7], 20 kg of confectionery products such as chocolate and biscuits[8], 4 kg of roasted coffee[9], 3.6 kg of savoury snacks[10] and 1-8 kg of breakfast cereals[11] per year. Experts estimate that acrylamide is present in 40% of all the calories ingested in the average diet[12]. This is why health authorities agree that keeping acrylamide levels in food as low as reasonably achievable (ALARA) is needed.

Acrylamide in food is recognised as a major concern for public health by international organisations such as the World Health Organization (WHO)[13] and EFSA[14]. Indeed, exposure to acrylamide has been classified by the United Nations International Agency for Research in Cancer as a "*probable carcinogen*", similarly to other toxic substances such as heavy metals, nitrates, glyphosate and bitumen. As well as increasing the risk of cancer in consumers of all ages, acrylamide is also believed to be harmful to the nervous system. In particular, EFSA and its French counterpart have highlighted the exposure of babies and young children to acrylamide as being of particular concern[15].

Owing to its toxicity, EU legislation exists to reduce exposure to acrylamide from industrial sources (i.e. water treatment, cosmetics, packaging, etc.)[16] through the setting of maximum legal limits. However, there are no restrictions on the presence of acrylamide in foods, which is believed to be by far the largest source of exposure to acrylamide for non-smokers[17]. Instead, EU regulators have taken a *soft approach* based on the monitoring of acrylamide levels found in foods and the setting of indicative values, as a benchmark to verify an effective application of practices to reduce acrylamide levels.

However, the indicative values are so high that they simply serve to lock in low ambition. Indeed, investigations conducted by Member States highlight that food industry awareness of what constitutes best practice is very variable, with many operators completely unaware of the risks associated with acrylamide and many others refusing to apply preventative measures altogether for a range of reasons (i.e. lack of legal obligation, economic costs or lack of experience)[18].

EFSA's scientific opinion published in 2015[19] confirms that the voluntary approach has failed, as there is no evidence that levels of acrylamide in most food groups are decreasing. Public pressure following the publication of EFSA's opinion led to Denmark adopting indicative values lower than the EC benchmark as the later were not considered to provide sufficient protection to consumers[20]. This has also led the EC to start discussions on a proposal to introduce soft regulatory measures mandating the implementation of codes of practice developed by the different industry sectors themselves (i.e. FoodDrinkEurope (FDE), Association of Plant Bakers (AIBI), The European Association of Craft, Small and Medium-Sized Enterprises (UEAPME), Serving Europe and the European Association of Hotels, Restaurants and Cafes (HOTREC)).

The proposed measures, supported by the food industry, are considered insufficient to protect consumers and unlikely to be effective by civil society organisations and food safety NGOs[21].

2. KEY FACTS ABOUT THE EU FOOD SUPPLY CHAIN

The food supply chain includes all activities required to bring food from the farm to our table. This involves a very diverse range of market players associated with the different stages of cultivation, production, processing, distribution and consumption.

In the context of reducing acrylamide's presence in food, a number of effective interventions have been identified at the different stages of the food supply chain ranging from agronomy to final consumer guidance[22]. Key players include farmers, food and drink manufacturers and food service providers.

ACRYLAMIDE IN FOOD

WHAT IS IT ?

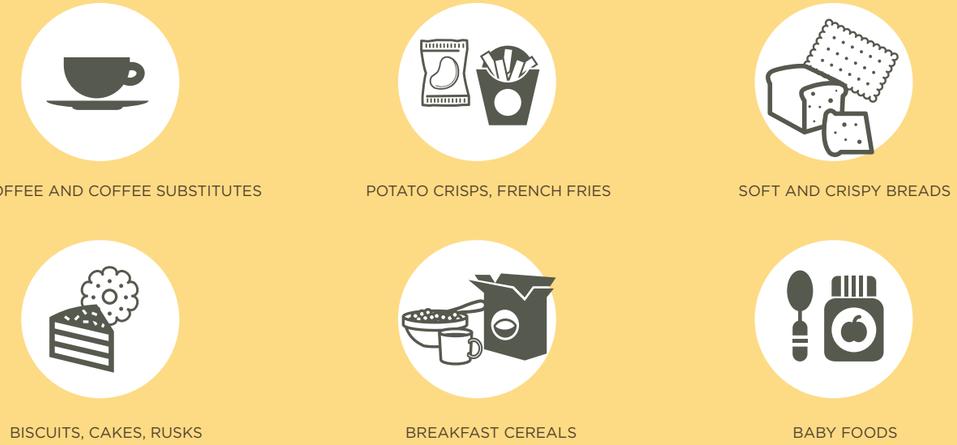
Acrylamide is a chemical compound that typically forms in starchy foods when they are baked, fried or roasted at hight temperatures (120°-150°C).

THE MAIN CHEMICAL REACTIONS IS KNOWN AS THE

MAILLARD REACTION

When the sugar and amino acid naturally present in starchy food are heated, they combine to form substances giving new flavours and aromas. This also causes the browning of the food and produces acrylamide.

ACRYLAMIDE IN FOOD IS MOSTLY FOUND IN:



POTENTIAL HEALTH EFFECTS

Laboratory tests show that acrylamide in the diet causes CANCER in animals and can damage the DNA. Scientist conclude that acrylamide in food potentially increases the cancer risk for consumer of all ages.

The exposure of some babies and young children to acrylamide gives rise to particular concern, according to EFSA and the French Food Safety Authority (ANSES)

Source: EFSA

2.1. Farming

There are 12 million farmers at the heart of the EU food supply chain. Family farms are still typical and the average farm size is 15 hectares, about ten times lower than other developed economies such as the US[23]. Nevertheless, EU agricultural production is the world's second largest in terms of value after China. EU farming interests are represented by an organisation called COPA-COGECA.

EU cereal production is widespread across Member States, taking up around half of all arable land. The main crops grown are wheat, maize and barley. EU production, which stands at 300MT, is projected to increase and the EU is likely to remain a net exporter of cereals in the coming years[24]. EU potato production stands at 59MT, and is focused in Germany, France, the Netherlands, Poland and the UK, taking up around 2% of all arable land. The EU is a net exporter of potatoes[25]. In contrast, the EU imports almost all of the coffee and cocoa beans that it consumes.

2.2. Food and Drink Manufacturing

The Food and Drink industry sector is the largest manufacturing sector in the EU with an annual turnover of €1,089 billion, employing over 4.25 million people. There are almost 300,000 companies operating in this sector[26]. The Food and Drink manufacturing sector is represented at EU level by FoodDrinkEurope (FDE).

A specific characteristic of the sector is the wide range of company sizes. The sector is dominated by small and medium enterprises (SMEs), representing 99.1% of all the companies operating in this sector and almost 50% of total turnover. In more detail, 79.8% of all companies are micro- (<10 employees), 16.3% are small (10-49 employees) and 3.7% are medium (50-249 employees) size enterprises.

By turnover, the largest food and drink production is that of France (€184.5 billion), followed by Germany (€172.2 billion), UK (€120.9 billion) and Spain (€93.4 billion). However, the largest number of companies are found in France (62k), Italy (55k), Spain (28k) and Poland (15k). The ratio between these indicators suggests that the smallest companies are to be found in Italy, Slovenia, Portugal and France (average <10 employees) while the largest ones are in Ireland, Greece, UK, Germany and Slovakia (average >50 employees).

Despite the prominence of small players, the sector also includes some of the largest companies in the world. These include well-known, multi-billion euro brands such as Cargill, PepsiCo, Coca-Cola, Mars, Kraft Heinz, etc. that produce a broad range of food and drink. Top EU companies producing food and drink, with annual sales above €10 billion, include Nestle, Unilever, DANONE and Ferrero.

In terms of trade, the EU remains the global exporter of food and drink products, which have doubled over the past decade to reach €98.1 billion in 2015. The EU's top export markets for food and drink products are the US, China, Switzerland, Japan and Russia. In contrast, EU imports represented €72.9 billion over the same period, with Brazil, US, Argentina, Switzerland and China as its main trading partners. Major traded food and drink products include chocolate, confectionery, biscuits, food preparations and coffee[27].

2.3. Hospitality and eating-out sectors

The EU hospitality industry alone, which includes bars, restaurants, hotels, cafes and similar establishments, employs 9.5m people and contributes €1tn to the EU economy[28]. The hospitality industry is spread across 1.7 million enterprises and its interests are represented by Hospitality Europe (HOTREC). Major companies in the eating-out sector are represented by Serving Europe, and micro and small enterprises are represented by the European Association of Craft, Small and Medium-Sized Enterprises (UEAPME).

Hospitality enterprises are predominantly of small and medium size. It is estimated that 99% fit into the category of small (<50 employees), with as many as 92% of the total being defined as micro-enterprises (<10 employees)[29].

In contrast, there are a number of multi-billion euro players in this sector, including hoteliers such as Accor Hotels, InterContinental, Best Western, Marriott, Hilton, etc. and restaurant chains such as McDonald's, Burger King, Starbucks, Domino's Pizza, etc.[30] (represented by Serving Europe).

MAJOR FOOD AND DRINK CORPORATIONS *

IN BILLION EUROS

Cargill	Nestlé	pepsi	Coca-Cola	BUNGE
97 BILLION	83 BILLION	57 BILLION	40 BILLION	39 BILLION
AGRICULTURAL COMMODITIES	MANUFACTURING	MANUFACTURING	MANUFACTURING	AGRICULTURAL COMMODITIES AND MANUFACTURING

ADM	McDonald's	Mars	Mondelēz International	KraftHeinz
34 BILLION	33 BILLION	30 BILLION	27 BILLION	25 BILLION
AGRICULTURAL COMMODITIES AND MANUFACTURING	FOOD SERVICE	MANUFACTURING	FOOD SERVICE	FOOD SERVICE

Unilever	DANONE	GRUPO BIMBO	Kellogg's	DUPONT
23 BILLION	22 BILLION	12 BILLION	12 BILLION	12 BILLION
MANUFACTURING	MANUFACTURING	MANUFACTURING	MANUFACTURING	MANUFACTURING

STARBUCKS COFFEE	Marriott	ConAgra Foods Food you love	SUBWAY	FERRERO
12 BILLION	11 BILLION	11 BILLION	11 BILLION	10 BILLION
FOOD SERVICE	HOTELS	MANUFACTURING	FOOD SERVICE	MANUFACTURING

Hilton
10 BILLION
HOTELS

*It excluded corporations whose production is focused on food products that typically do not contain acrylamide in high levels such as meat, dairy and alcohol beverages.

Source: FDE and various.

3. WHAT CAN BUSINESSES DO ABOUT ACRYLAMIDE?

Although the formation of acrylamide in food cannot be completely prevented, research conducted since its discovery in food in 2002 has produced a wealth of knowledge about how responsible food business operators right along the food supply chain can reduce the amount of acrylamide present in the final product[31].

The effectiveness of these measures is based on influencing the chemical reaction that leads to the formation of acrylamide. They can be divided into three major groups:

- measures aimed at lowering the amount of acrylamide precursors (i.e. sugars and asparagine) in the raw materials;
- measures at different stages of food production, including making modifications to the product's recipe and controlling conditions during the heating and cooking process;
- measures aimed at advising food service providers and customers on how to avoid further acrylamide formation during the final stages of food preparation.

Using a selection of these measures, which are product specific, food manufacturers have reported acrylamide reduction of up to 95%[32].

3.1. Measures to reduce the presenceof acrylamide in food

3.1.1. Reduce sugars and asparagine (acrylamide precursors) in raw materials

The implementation of certain agronomical practices at farm level can have a significant impact on acrylamide formation. For root vegetables, these range from implementing best practice during cultivation and harvest and selecting lower sugar tuber varieties. In addition, tubers should be stored and transported under controlled conditions including temperature (below 6°C), humidity and duration to minimise sweetening when maturing (i.e. senescence).

3.1.2. Preventative action at different stages of food production

a) Modify the basic product recipe to inhibit acrylamide formation

A number of changes in the basic product recipe can ultimately lead to significant acrylamide reductions in the final product. These include considerations about the range of secondary ingredients, additives, other agents and enzymes included in the recipe, the degree of acidity and moisture and the preparation method. For example, cutting potatoes in thicker strips leads to reductions in the acrylamide levels of fried products.

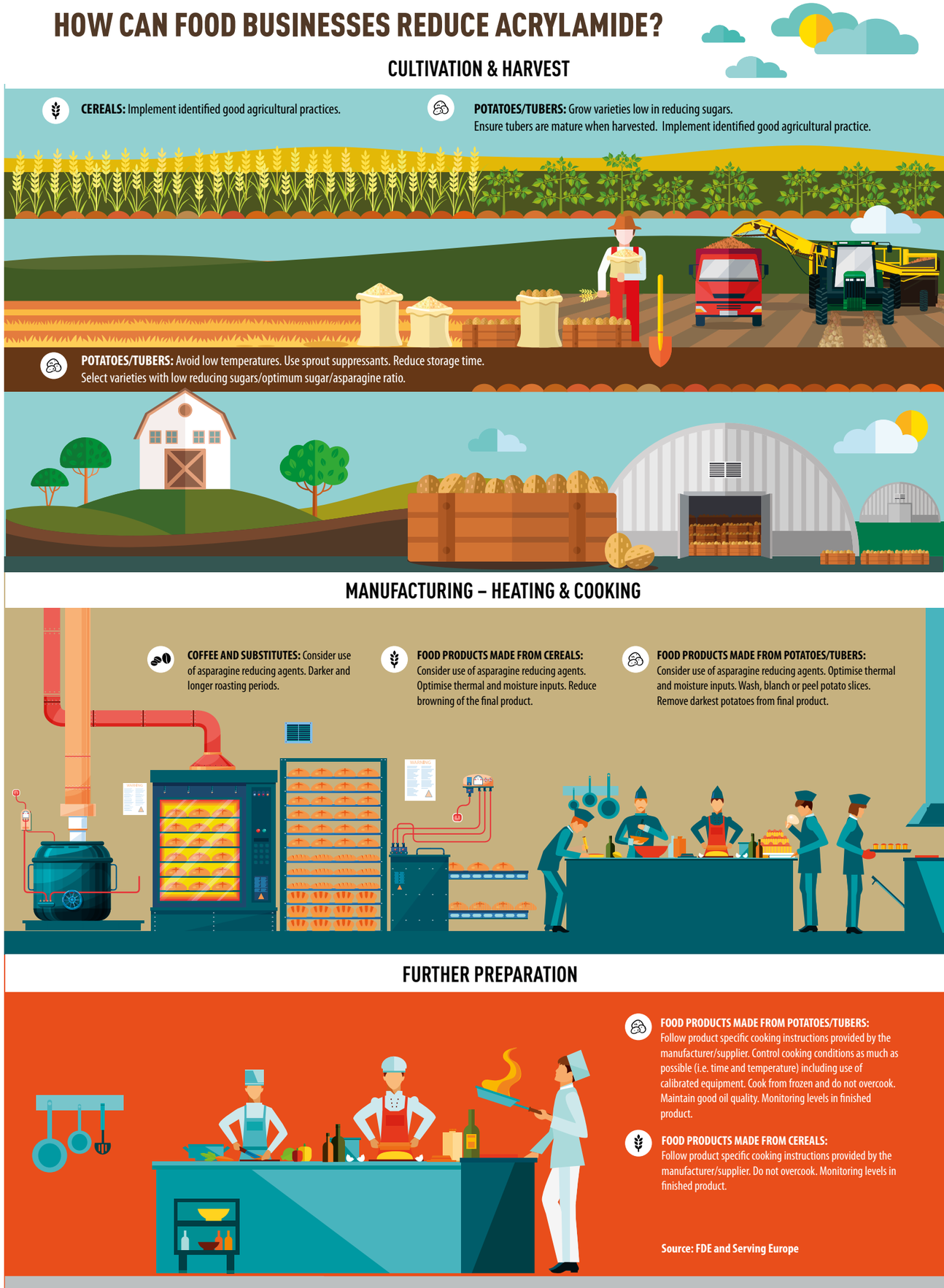
b) Control conditions during the heating and cooking process

The length and the temperature of the cooking process is the most critical part of the acrylamide formation process. Food operators can reduce acrylamide formation at this stage through implementing certain processing practices (i.e. blanching and peeling, other treatments of raw materials before cooking, etc.), optimising the cooking conditions (i.e. tight thermal input and moisture controls), monitoring the colour as part of the quality control of the final product (i.e. removing dark products).

3.1.3. Provide preventative advice for further preparation

In the case of certain products where further heating at a business outlet or at home is required, it is also important that specific recommendations are provided by food business operators in order to avoid increasing acrylamide concentration significantly. These may include product cooking instructions (i.e. temperature, cooking method, etc.) on the packaging for the consumer or specific guidance given to employees in the hospitality sector. For professional end users, this may include calibrated equipment (i.e. timers, frying curves, colour grading charts, etc.).

The umbrella bodies for the different sectors apart from COPA-COGECA (i.e. FDE, AIBI, UEAPME, Serving Europe and HOTREC) have included detailed information on the broad range of possible measures to reduce acrylamide levels in food in their respective codes of practice.



However, the response of food business operators has so far been disappointing. There is no evidence that such measures are being applied effectively as no major changes in acrylamide concentrations across major food groups has been observed.

4. HOW MUCH ACRYLAMIDE IS PRESENT IN OUR FOOD?

Since 2007, most Member States have been taking part in a EU-wide program to monitor the levels of acrylamide found in foods[33]. Data for the years 2007-2014, which has been provided by the European Food Safety Authority (EFSA) following an access to documents request, contains information on the acrylamide levels found in over 25,000 food samples[34]. As illustrated on the right hand side, a majority of the samples were taken in Germany. Although EFSA has previously published information on trends observed on acrylamide levels, it seems that the analysis of the post-2012 dataset has not yet been made available[35]. A few countries publish their own data online, including brand names, while others do not show the same level of transparency.

The analysis of this dataset as conducted by Changing Markets and presented in this report provides a number of important findings.

- There continues to be no substantial trend across food groups towards lower levels of acrylamide. While trend analysis across major food categories suggests a slight downward trend for acrylamide levels in potato crisps and snacks, crisp bread, and biscuits and crackers, acrylamide levels in French fries, gingerbread and roasted coffee suggest concentrations are unchanged or increasing;

- A very significant proportion of food products placed on the market (2,200 or 12% of the total) presented unacceptably high levels of acrylamide above the current benchmark set by the European Commission[36]. The percentage of food samples above the benchmark levels was similar for food samples produced outside and within the European Economic Area;

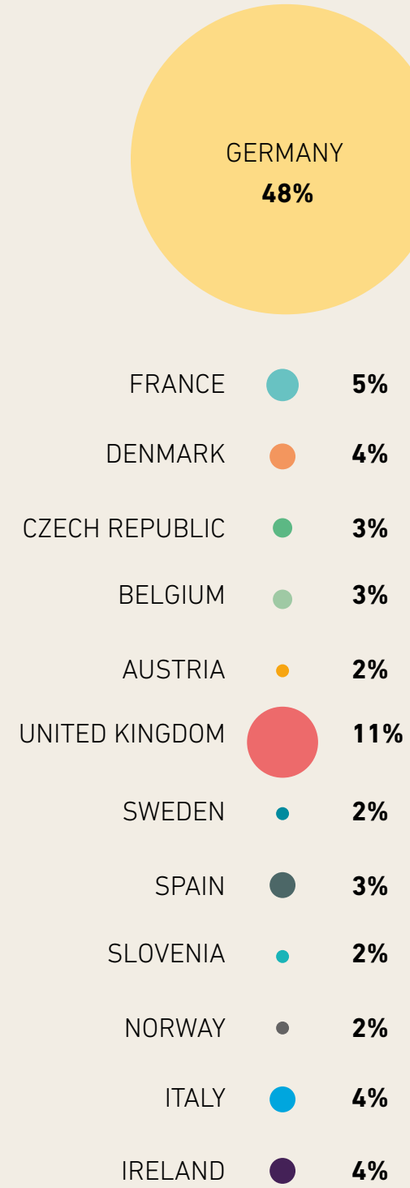
- The highest acrylamide concentrations at 38,000 and 7,900 µg/Kg were found in a sample of instant coffee sampled in Belgium and a sample of French fries sampled in Denmark. These are 42 and 13 times higher than the EC benchmarks for these products;

- The highest acrylamide concentrations on food products targeted at babies were 1905, 1508 and 582 µg/Kg. These were found in samples of baby rusks, baby foods and in processed cereal baby products taken in Germany, UK and Czech Republic respectively. These levels are 10, 30 and 12 times higher than the current EC benchmarks for these products. In 2014, 12% and 28% of baby foods and processed cereal foods for infants respectively exceeded the EC benchmark;

- The countries that had the largest percentage of samples with levels of acrylamide above the current EC benchmark are: Greece (75%), Estonia and Sweden (20%), Belgium and Ireland (18%), Italy (17%), Norway (16%), Austria (15%), Spain and Finland (14%).

SAMPLES ANALYSED PER COUNTRY AS REPORTED TO EFSA

(AS A PERCENTAGE OF THE TOTAL)



5. CONCLUSIONS AND RECOMMENDATIONS

The results of the official monitoring exercise released by EFSA show that a majority of food business operators have not been implementing effectively the range of known tools to reduce the presence of acrylamide in foodstuffs. Follow-up investigations conducted by Member States point towards a range of possible reasons for this failure including the lack of awareness of acrylamide as a food safety issue, unwillingness to cover associated costs, lack of expertise in terms of implementing the changes and ultimately the lack of a legal obligation to do so.

Given the failure of the current voluntary approach, the Commission is now working on a legislative proposal with the aim of reducing the presence of acrylamide in foods. The Commission's latest proposal includes:

- the introduction of a requirement for food business operators to apply the codes of practice as part of other measures already included under Hygiene legislation[37];
- requirements for food business operators to maintain product testing records to demonstrate that they are applying their codes of practice effectively;
- a set of reference levels (indicative values) for acrylamide levels in food products to serve as a benchmark to verify the effectiveness of the application of the codes of practice;

- an indication that legal limits for specific food products in future may be introduced if businesses fail to apply the codes of practice.

The proposal falls short of applying maximum levels for acrylamide in food, which would be in line with the way other contaminants are dealt with and in compliance with the precautionary approach, one of the fundamental legal principles of the EU treaties. This is a missed opportunity that should be rectified.

5.1. Recommendations for improving the Commission's proposal

In order to ensure the effective and real reduction of acrylamide levels in the majority of food products placed on the EU market, we recommend the following key amendments:

5.1.1. Apply maximum legal limits on the levels of acrylamide in different food groups as is the case with other contamina nts

The lack of clearly binding legal limits for acrylamide in food products **allows food products with unacceptably high acrylamide levels to continue to be placed on the market**, even in the cases where food business operators are found **not to be complying** with any of the measures outlined in the codes of practice. In addition, the lack of binding levels continues to allow for **imported food products to contain high levels of acrylamide**, as it is unclear how such food business operators that are outside the EU could be investigated by EU's food agencies.

ACRYLAMIDE (AA) CONCENTRATIONS FOUND IN FOODS ON SALE IN THE EU 2007-2014 (µG/KG)

	Number of samples	EC indicative value AA	Minimum AA	Average AA	Maximum AA	Maximum value as a% of EC Benchmark	Country (sale) of sample with maximum value	Country (origin) of sample with maximum value
BABY FOOD								
BABY FOODS	372	50	1	61	1508	3016	UK	UK
CEREAL BASED BABY FOODS	228	50	2	73	582	1164	Czech Republic	Spain
BISCUITS AND RUSKS CHILDREN	381	200	3	166	1950	975	Germany	Germany
BAKERY								
SOFT BREAD (OTHER)	474	150	3	152	2565	1710	Germany	Germany
SOFT BREAD (WHEAT)	350	80	2	56	910	1138	Belgium	?
SAVOURY AND SWEET BISCUITS	2415	500	2	253	4988	998	Greece	?
CRISPBREAD	961	450	2	228	2430	540	Germany	Germany
GINGERBREAD	1677	1000	4	483	4095	410	Germany	Germany
BREAKFAST CEREALS								
BREAKFAST CEREAL (OTHER)	452	200	2	139	1556	778	Germany	Germany
BREAKFAST CEREAL (BRAN/WHOLE)	434	400	12	193	2072	518	Czech Republic	Germany
BREAKFAST CEREAL (WHEAT/RYE)	70	300	41	201	558	186	Spain	Spain
COFFEE								
INSTANT COFFEE	335	900	11	931	38000	4222	Belgium	?
ROASTED COFFEE	1521	450	5	246	3779	840	Germany	Germany
COFFEE SUBSTITUTES (OTHER)	265	4000	7	1092	5400	135	Belgium	EU
COFFEE SUBSTITUTES (CEREALS)	19	2000	81	319	1056	53	UK	Poland
POTATO PRODUCTS								
FRENCH FRIES	3884	600	1	330	7900	1317	Denmark	Sweden
POTATO CRISPS & SNACKS	2741	1000	6	542	6719	672	Greece	Greece

Source: European Food Safety Agency

5.1.2. Ensure that the reference values are set towards the lower level of acrylamide concentrations found

Currently the reference values that are used to demonstrate that the codes of practice are being applied are effectively set at the 90th percentile of the results from the monitoring exercise. This means that the **values are too high and do not encourage the significant reductions** that could be achieved by food business operators if they were to implement the code of practice effectively. As such, these values must be set at levels towards the lower, and not the upper, range of concentrations that are observed in the data. This would be more in line with the **precautionary approach**.

5.1.3. Strengthen food industry monitoring requirements

As they stand now, the requirements on food business operators to sample and test their own products for acrylamide are likely to be ineffective because the minimum requirement mandates a **very infrequent and non-representative sampling frequenc**y (i.e. minimum one sample a year) and they allow business operators to **replace a laboratory test with an approximate measurement** of product attributes such as "colour" test. It is questionable whether the latter is an appropriate way to test a product against the indicative values. Despite the low burden implied by such requirements, these are **even further simplified** for certain types of businesses (i.e. restaurants, hotels, small businesses supplying ready-to-eat food).

While the rationale of minimising the administrative burden for small and micro enterprises is understandable, these groups represent over 95% of the entire sector and too much simplification may completely **compromise the effectiveness of the measures**. In addition, it may reduce further consumer protection as certain Member States (i.e. Italy, France, Slovenia, Portugal, etc.) are dominated by smaller size enterprises.

5.1.4. Ensure a fair and level playing field across businesse

The Commission's proposal seems to make a somewhat **arbitrary choice** as to which businesses fall under the different requirements. For example, it applies the first set of criteria **equally to food giants such as Nestle and certain small food manufacturers** that do not supply food directly to the consumer, allowing the former to use simplified analytical requirements such as colour testing.

In addition, it **further simplifies** the already simple requirements for all food business operators in the hospitality and eating-out sector regardless of their size and turnover. This leads to an unfair situation whereby **multi-billion euro companies in the food business sector, such as McDonald's and Pizza Hut, as well as hotel chains such as Marriott and Hilton, are exempted** from any meaningful monitoring and treated in the same way as family-run cafes and bakeries. It is unacceptable to propose anything other than a robust sampling and testing programme for large food business operators.

5.1.5. Codes of practice allow food operators to pick and choose, and are impossible to verify without binding levels

The legislative requirements on business operators to apply the codes of practice are **very general** and in practice are likely to continue to allow business operators to choose which measures, if any, may be adopted to reduce the presence of acrylamide in foods. Making these measures mandatory will increase awareness of acrylamide amongst food business operators but it is **unlikely to lead to changes in practices of food business operators** unless more specific requirements and penalties are introduced. While mandating the application of the codes of practice is a positive development, it is unlikely to lead to meaningful reductions of acrylamide in products unless mandatory limits and higher controls are implemented.

For all the reasons above, it is unclear why the Commission continues to shy away from setting ambitious legally-binding limits for acrylamide in food products under contaminants legislation. This is the approach that has been deemed effective in terms of reducing exposure to acrylamide from non-food sources and from other contaminants found in food. This is particularly intriguing as the Commission's stated intention to potentially do this at a later stage in a review clause indicates little trust in the effectiveness of the proposed measures. That would also avoid the inclusion of references to two different legal basis in the proposal which is confusing.

All in all, the current proposal, ultimately fails to protect consumers, particularly those most vulnerable such as babies and infants, from being exposed to products with high levels of acrylamide. The Commission and Member States should seize the opportunity to improve it.

1. Available at http://www.fooddrinkeurope.eu/publication/fooddrinkeurope-updates-industry-wide-acrylamide-toolbox/
2. http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2015.4104/epdf
3. Changing Markets is still conferring with EFSA with regard to obtaining additional information on the individual food samples, such as brand names, to provide greater transparency for European consumers.
4. Indicative values do not reflect safety thresholds and are only intended to reflect a benchmark for effective application of measures included in the acrylamide reduction "toolbox". As set out by 2013/647/EU.
5. Available at http://pubs.acs.org/doi/abs/10.1021/jf020302f
6. http://ec.europa.eu/agriculture/publi/reports/fruitveg/potato/sec533_en.pdf
7. http://www.bakersfederation.org.uk/the-bread-industry/industry-facts/european-bread-market/
8. https://www.mah.se/PageFiles/55093/caobisco-statistical%20bulletin%202013.pdf
9. http://www.ecf-coffee.org/about-coffee/coffee-consumption-in-europe
10. http://www.esasnacks.eu/europe-statistics.php
11. http://www.ceereal.eu/images/publications/DOC_ASPE_CEEREAL_CORPBROCHURE_FINAL.pdf
12. http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm374855.htm
13. http://www.who.int/mediacentre/news/notes/2005/np06/en/
14. https://www.efsa.europa.eu/en/press/news/150604
15. https://www.anses.fr/fr/content/l'anses-passe-au-crible-l'alimentation-des-enfants-de-moins-de-trois-ans
16. EC/1223/2009, EU/10/2011, EC/1907/2006, EU 2015/1787.
17. https://www.cancer.gov/about-cancer/causes-prevention/risk/diet/acrylamide-fact-sheet
18. https://www.efsa.europa.eu/sites/default/files/event/documentset/141210-p13.pdf
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30. http://www.servingeurope.com/en/we-are-serving-europe/aua/
31. http://www.fooddrinkeurope.eu/uploads/publications_documents/AcrylamideToolbox_2013.pdf
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33. 2007/331/EC and subsequent recommendations.
34. Data quality control led to the removal of 20% of the samples (i.e. acrylamide levels below the reported limit of detection, samples for which significant amount of information was not included in the dataset, etc.)
35. http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2015.4104/full
36. Indicative values do not reflect safety thresholds and are only intended to reflect a benchmark for effective application of measures included in the acrylamide reduction "toolbox". As set out by 2013/647/EU.
37. Regulation (EC) No. 852/2004

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