

The Cost of Food Crime Phase 2 - Results

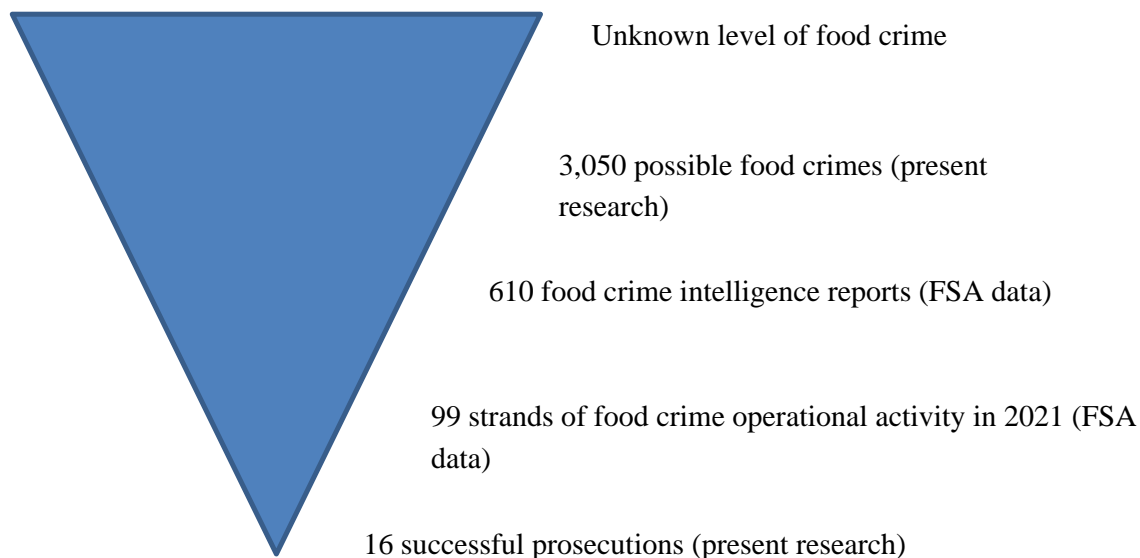
3.1 Food Fraud Attrition 2021

The research did not find any examples of food fraud in the large business sector. That is not to say such activities do not exist, for example, there may be food fraud masked by issues categorised as non-compliance. Just 0.5% of food firms employ over 250 people, yet they constitute 64% (£375 billion) of the £585 billion industry turnover (BEIS, 2021). The findings suggest that the bulk of the food industry has built resilience to fraud because it invests heavily in quality and regulatory compliance controls, including diagnostic testing that objectively identifies non-compliance. On the other hand, the interviews, victimisation rates in the FBO Tracker survey, the enforcement data and the web scraping exercise all indicate that the small business sector is vulnerable to food fraud, though the incidence rates are low. Having determined from these primary and secondary sources that the observable food crime rate is low, the most reliable data is mapped out in Figure 3 to illustrate the attrition from the unknown extent of the problem down to the proven extent of the problem. The data provides a snapshot of the incident rates at the measurable stages of enforcement. The present research developed the estimates for possible food crimes (3,050) and prosecutions (16) prosecutions. It is important to note that the attrition diagram does not represent the outcome of a coherent cohort of crimes because the estimates are derived from different sources. Consequently, the figures at each stage of the attrition diagram are not sub-sets of the higher figures. Nevertheless, the data provides a snapshot of the incident rates at the measurable stages of enforcement in 2021.

Figure 3 Food Fraud Attrition 2021 (accessible version)

- Unknown level of food crime
- 3,050 possible food crimes (present research)
- 610 food crime intelligence reports (FSA data)
- 99 strands of food crime operational activity in 2021 (FSA data)
- 16 successful prosecutions (present research)

Figure 3 Food Fraud Attrition 2021



One measure of the food crime rate in the UK is the number of prosecutions identified by the scraping exercise (16), but this does not reflect reality at all as it represents only those cases which are proven at court. A more reasonable figure is the 610 food crime intelligence reports recorded by the FSA. This figure is an estimate of suspected food fraud: it excludes reports related to hygiene and regulatory issues, theft and other criminality. It is the closest equivalent to police recorded fraud crime, and, just like the police recorded crime statistics, it may include cases that subsequent investigations deem are not crimes. However, as with all crime statistics, the 610 figure is undoubtedly an underestimate that should be regarded as a lower threshold figure because it only includes detected cases that have caught the attention of the authorities and have been identified as carrying the hallmarks of fraud. The estimate therefore excludes the dark figure of undetected and unreported food fraud, including fraud cases which are incorrectly labelled by the authorities as non-compliant with the regulations due to negligence or mistake. It is a key figure used in the cost of food crime model. The estimate provides a key ratio for benchmarking purposes:

- Suspected / prosecution ratio: $610/16 = 38$

Findings from the 2021 FBO Tracker survey are used to estimate the dark figure of food fraud and thereby provide an upper threshold limit for the number of crimes. The survey found that just 1 in 5 business victims report food fraud to the authorities, so that 80% remain hidden. Therefore an indicative upper threshold can be calculated by multiplying the number of suspected cases by a factor of 5:

- Experience / reporting ratio = 5
- Indicative upper threshold: $610 \times 5 = 3,050$ cases per year

The necessary, key caveat for this upper estimate is that the unit of measure for the survey is victims, whereas the unit of measure for the recorded and prosecuted crimes is cases. Consequently, as many crime cases have multiple victims, using victimisation rates for cases overestimates the number of cases. Nevertheless, the 3,050 cases per year upper estimate provides an indicative ceiling for the sensitivity analysis and an upper boundary for the CoFC model.

Further work is required to develop these estimates. Whilst the FBO Tracker survey provided estimates of victimisation in the small business sector, it did not estimate the level of offending by small businesses as this would require them to self-report their criminality. One way forward for this sector is to leverage an asset of the current regulatory regime to more reliably discriminate between food fraud and other incidents. The regime is unique in that the regulated industry is subject to thousands of inspections each year, including product sampling and testing: in 2017-18 English local authorities tested 30,744 samples (NAO, 2019) and members of the Food Industry Intelligence Network (FIIN) pool over 50,000 authenticity tests for intelligence purposes. [\(footnote 1\)](#) These are potentially rare and powerful sources of data for crime research based on very large samples. It would require investment to create a coherent data source based on common data standards, and it would require the inspectors tuning into the 'red flags' or hallmarks of food fraud. Until then, an interim solution would be to survey local authorities and other enforcement agencies.

A similar approach to differentiation could be used to estimate the extent that large food companies incorrectly label a product as merely non-compliant when it actually bears the hallmarks of food fraud. Such a research project would further expose the dark figure of food fraud, but it would necessarily require the close collaboration of the private sector.

3.2 Cost of Food Crime in the UK

The total impact of food crime on the UK is estimated to be between £409 million and £1.96 billion per year, presented in Table 8. The scale of food crime is equivalent to between 0.07% and

0.33% of the UK food industry turnover each year (BEIS, 2021). The range in estimates of the total costs reflects the further research required to develop the quality of data in order to improve the estimate and narrow the range with confidence. Notably, the prevention costs to businesses is missing from the results presented in this report because it has not been possible to discriminate between quality control costs and fraud prevention costs.

Table 8 Average and total costs of food crime by affected agent

| Affected agent | Average cost Non-major case | Average cost Major case | Total cost (includes prevention costs) |
|-----------------------------------|-----------------------------|-------------------------|--|
| All agents (610 cases per year) | 87,099 | 4,299,691 | 408,965,136 |
| All agents (3,050 cases per year) | As above | As above | 1,961,177,398 |
| Individual (610 cases per year) | 2,282 | 719,657 | 58,280,014 |
| Business (610 cases per year) | 22,313 | 3,235,904 | 268,448,872 |
| Government (610 cases per year) | 62,503 | 344,129 | 83,500,028 |

Source: Authors' calculations, Cost of Food Crime model 2022.
All figures presented in £ at 2021 prices.

Once a food fraud has been committed (excludes prevention costs), the average cost is estimated at £87 thousand for small cases and £4.3 million for major cases. In major cases (approximately 13% of cases), the burden falls more sharply on businesses through the loss of property from purchasing criminalised goods. Conversely, a larger share of the burden falls on government in smaller cases through justice costs. The total burden of food fraud on businesses is £268 million per year, larger than the burden to government of £84 million (including prevention costs) and to individuals £58 million per year.

Tables 9 and 10 show the average cost per case by food and crime type. Each case is estimated to cost between £16 thousand and £151 thousand for small cases and between £423 thousand and £7.2 million for larger cases, depending on food and crime type. Cases involving meat or alcoholic beverages tend to cost more per case. Some of the costliest large cases involved waste diversion of meat and fish that is unfit for consumption, this is due to the large volume of food involved.

Table 9 Average costs of food crime by crime type

| Crime type | Average cost (£) Non-major case |
|------------|---------------------------------|
|------------|---------------------------------|

| | |
|--------------------|---------|
| Adulteration | 86,901 |
| Document fraud | - |
| Illegal processing | 151,627 |
| Misrepresentation | 35,858 |
| Substitution | 24,575 |
| Waste diversion | 82,608 |

Source: Authors' calculations, Cost of Food Crime model 2022.
All figures presented in £ at 2021 prices.

Table 10 Average costs of food crime by food type

| Food category | Average cost (£) Non-major case | Average cost (£) Major case |
|--|---------------------------------|-----------------------------|
| 01 - Meat And Meat Preparations | 111,541 | 2,655,364 |
| 02 - Dairy Products And Birds' Eggs | 16,232 | 423,114 |
| 03 - Fish Crustaceans, Molluscs; Prep. Thereof | 28,597 | 2,296,878 |
| 04 - Cereals And Cereal Preparations | - | - |
| 05 - Vegetables And Fruit | 18,034 | 2,210,845 |
| 06 - Sugars, Sugar Preparations And Honey | 22,434 | - |
| 07 - Coffee, Tea, Cocoa, Spices; Manuf. Thereof | - | - |
| 08 - Feeding Stuff For Animals, Excl. Unmil. Cer | - | - |

| Food category | Average cost (£) Non-major case | Average cost (£) Major case |
|---|---------------------------------|-----------------------------|
| 09 - Miscellaneous Edible Products And Prep. | 14,557 | - |
| 11 - Beverages | 27,401 | 7,233,097 |
| 12 - Tobacco And Tobacco Manufactures | - | - |
| 22 - Oil Seeds And Oleaginous Fruit | - | - |
| 41 - Animal Oils And Fats | - | - |
| 42 - Fixed Vegetable Fats And Oils | - | - |
| 43 - Process.Anim.And Veg.Fats And Oils;Waxes | 64,737 | - |

Source: Authors' calculations, Cost of Food Crime model 2022. Food categories are Standard International Trade Classifications. All figures presented in £ at 2021 prices.

The cases collected do not cover all food and crime types. This highlights an important feature of the model presented in this report: that whilst this dataset and estimate provides a significant contribution to understanding the cost of food crime in the UK, further data is needed in order to provide completeness and accuracy. When considering estimates at a granulated level such as by food or crime type, it should be noted that the estimates rely on subsection of the data, reducing the estimate confidence.

Approximating the scale of criminalised activity using the quantity of criminalised food uncovered at the perpetrator's premises following authority intervention, provides an estimate of the value of fraudulent goods in the UK is between £296 million and £1.48 billion per year. This is the quantity of criminalised goods reported at market prices.

3.3 Case study of food crime costs

To provide a working context to the methodology employed in estimating the cost of food crime in the UK, Table 11 provides a breakdown of costs and information regarding a single case.

The inclusion of market costs within an estimate of the impact of crime is unique to this model. The market costs are the losses of profits for genuine firms that arise from criminal food entering the supply chain. Therefore, these costs are in addition to estimates of the market value of fraudulent products. Results show that the size of the market cost is on average 0.6% of the market value of the fraudulent product and up to 3% in some cases. In the example case shown in Table 11, the market cost is £34.20 (or 0.07% of the market value), reflecting the strong volume of competition at the point of entry into the supply chain and geographic area for the corresponding food category.

Table 11 Detailed cost breakdown of single case study

| Details | Cost information | Notes |
|------------------|------------------------|-----------------------------------|
| Case type | Major case, case study | From interviews and media reports |
| Product | Beef and lamb | - |
| Crime type | Illegal processing | - |
| Origin location | Swindon, UK | - |
| Start / end year | 2020 | - |

Justice costs

| Cost type | Cost information | Notes |
|--|--------------------------------------|--|
| Organisation | LA, FSA, CPS, police | Reported organisations handling the case |
| Regulatory sanction/intervention | Prosecution | Prosecution, warning, etc. |
| Authority hours | 2075 hours | Hours spent working case |
| Police hours | 40 hours | Hours spent working case, if not included above |
| Hours cost (at £27.47/hr) (Gov) | £58,099 | Average salary of £50k FTE assumed |
| Contractor costs (Gov) | £5,000 | Costs for refrigerated vehicles and storage, a locksmith, and disposal |
| Criminal sanction (fine, suspended prison, prison) | 10 months sentence, £4024 costs paid | Reported sentencing |

| Cost type | Cost information | Notes |
|---|------------------------------|---|
| Legal costs of prosecution (Gov) | £12,500 approximately | From interviews, legal costs are typically £10,000 to £15,000 for a prosecution. Mid-point used |
| Prison Costs (Gov) | £37,538 | Ministry of Justice 2019-2020 cost per prisoner £42,670. 2020 |
| Less fines paid (Gov) | £4,023.58 | Less fines / costs paid as a consequence of prosecution |

Market costs

| Cost type | Cost information | Notes |
|---|----------------------------|---|
| Offender entry point in the supply chain | Manufacturing / production | Supply chain point at which the case is identified |
| Offender firm / franchise size (No. of Employees) | <10 people | Number of employees in offending organisation. Often revealed, otherwise Companies House accounts |
| Victim point in supply chain | Unknown | Supply chain point at which the case identifies the victim |
| Victim firm size (No. of Employees) | Unknown | Number of employees in offending organisation. Often revealed, otherwise Companies House accounts |
| Upstream competition level | UK | NUTS level at which competition is assumed |
| Upstream firms by 5 digit SIC | 3,470 firms | Number of firms producing similar food product by SIC, . NOMIS UK Business Counts 2022. |

| Cost type | Cost information | Notes |
|---------------------------------|--|---|
| Upstream SIC group | 46320 : Wholesale of meat and meat products 10120 : Processing and preserving of poultry meat 10130 : Production of meat and poultry meat products | SIC group of competition for product category |
| Downstream competition level | NUTS 3 | NUTS level at which competition is assumed |
| Downstream firms by 5 digit SIC | 935 | Number of local area firms retailing similar food product |
| Downstream SIC group | All food retail | SIC group of competition for product category |
| Elasticity | -0.568 | Own price elasticity of demand. NIESR Food and drink demand elasticities 2022 or DEFRA Food and drink elasticities 2011 |
| exp per week (p) | 80 | Household weekly expenditure on food product. Family Food Survey 2019/20 |
| q per week | 97 | Household weekly consumption on food product. Family Food Survey 2019/20 |
| Unit measurement | g | Uni of measurement used in the Family Food Survey 2019/20 |
| £ per unit | 0.0087 | Per unit price calculated from expenditure and quantity, unless price revealed by case information |
| Quantity of fraudulent good | 5100000 (g) of beef and lamb | Volume of fraudulent good in unit used by Family Food Survey |

| Cost type | Cost information | Notes |
|--|------------------|---|
| Market cost (business) | £34.20 | Cost to genuine firms caused by fraudulent product in the market |
| Total cost of case (excluding prevention costs) | £173,471 | Summation of elements in bold |

Victim costs

| Type of cost | Cost information | Notes |
|---|--|--|
| Possible health concern | Lack applicable safety information or regulatory authorization | Potential hazard as classified by Everstine et al (2018). |
| Reported health concern | No reported health concerns | - |
| Health care costs (Gov) | 0 as no harm reported | NHS costs of providing health care, incorporated from FSA COI 2018 or DfT TAG data |
| Individual expenses (Individual) | 0 as no harm reported | Personal expenses such as transportation to receive medical care, medication cost, funeral cost. |
| Lost earnings (Individual) | 0 as no harm reported | Loss of earnings due to being sick |
| Costs associated with absence from school (Gov) | 0 as no harm reported | School absenteeism due to sickness |
| Disturbance cost (Business) | 0 as no harm reported | Administration costs to business disruption due to employee being sick |
| Human cost of pain, grief & suffering (Individual) | 0 as no harm reported | Willingness to pay to avoid illness or premature death (death also includes loss of consumption) |

| Type of cost | Cost information | Notes |
|--------------------------------------|--------------------------------------|---|
| Loss of property (Business) | £44,403 | Market value of fraudulent product upstream. Volume identified in reports. Market price taken from Food Fraud Survey. |
| Loss of property (Individual) | 0 as product entered upstream | Market value of fraudulent product downstream. Volume identified in reports. Market price taken from Food Fraud Survey. |

Crime Career costs

| Cost type | Cost information | Notes |
|--------------------------------------|------------------|--|
| Length of prison sentence | 0.83 years | Years of jail sentenced |
| Annual gross pay - median | £23,905 | Median annual gross salary. Earnings and hours worked, place of residence by local authority: ASHE Table 8, 2021 |
| Crime career costs (Business) | £19,921 | Product (Length of prison sentence (years) Annual gross pay - median) |

Source: Authors' calculations, Cost of Food Crime model 2022.

All financial figures presented in £ at 2021 prices.

1. <https://www.fiin.co.uk/>