

Impact case study (REF3)

Institution: Queen's University, Belfast		
Unit of Assessment: UoA6		
Title of case study: The Elliott Review into the Integrity and Assurance of food supply networks: Transforming the UK Strategy on combatting Food Fraud		
Period when the underpinning research was undertaken: 2013 – 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s): Professor Chris Elliott	Role(s) (e.g. job title): Professor of Food safety	Period(s) employed by submitting HEI: 2006 to date.
Period when the claimed impact occurred: 2014 – 2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact		
<p>Industrial significance: Following the 2013 European Horsemeat Scandal, Professor Elliott was commissioned by UK Government to conduct a review of food supply systems. The Elliott Review detailed eight recommendations, which were accepted and acted on by Government.</p> <p>Economic significance: The Elliott Review resulted in establishment of: (i) National Food Crime Unit, the first new law enforcement agency in the UK for 25 years, employing 80+ staff and annual budget of GBP4,000,000; (ii) Scottish Food Crime and Incidents Unit with 16 officers; (iii) Food Industry Intelligence Network with 45 members and GBP115,000,000,000 turnover.</p> <p>Societal Significance: The implementation of the Elliott review 'consumer first' recommendations have increased meat origin transparency and restored consumer confidence.</p>		
2. Underpinning research		
<p>The development of novel and robust analytical methods to help regulators identify fraud in food supply systems has been a key research goal for Professor Elliott since the mid 1980's. The complex food supply system has provided the opportunity for food fraud on a global scale. In response, Professor Elliott and his team has pioneered the use of non-targeted methodologies, for example, mass spectrometric and spectroscopic technologies, capable of producing 'food fingerprints', which have underpinned the development of new, robust authenticity tests. Many of these tests have been integrated into national and international monitoring programmes and have been used successfully to detect instances of sophisticated food fraud such as; beta-agonist abuse in the Netherlands [3.1]; adulteration of oils in China [3.2]; shrimp fraud in India [3.3]. Professor Elliott's publications, describing how to implement non-targeted testing methods for food fraud detection and their use in regulatory environments [3.4, 3.5], have also been pivotal to driving a major shift in UK-government attitude and policies associated with food fraud and reduction of consumer risk [3.6].</p>		

The leading expertise of Professor Elliott led to him being commissioned in 2013, by the UK government, to conduct an independent review of the UK food supply system following the European Horsemeat Scandal [5.1]. Subsequently, he and his team of experts investigated interdisciplinary approaches to tackle the food fraud problem by organising and participating in over 150 meetings with stakeholders across the UK food supply system, including government agencies, law enforcement agencies, lawyers, the food industry, supply chain management, consumer groups and faith groups. Consultations with experts in financial fraud, organised crime, academics with expertise in behavioural sciences, human rights and other social science disciplines were also completed. A call for further evidence was published, which resulted in the accumulation of a large body of relevant evidence and opinions. These data provided a unique insight into the UK food system, its strengths, weaknesses and vulnerabilities to fraud and led to the publication of the interim Elliott report. The interim report was then taken forward through a series of participatory workshops, held across the UK, with the outcomes discussed in detail with the Secretary of State for the Environment. The vast amount of evidence collected was thematically analysed, critically considered and incorporated into the final Elliott Report [5.1], resulting in eight key recommendations: 1. Consumer first, 2. Zero tolerance, 3. Intelligence gathering, 4. Laboratory services, 5. Audit, 6. Government Support, 7. Leadership, 8. Crisis management. Professor Elliott worked closely with government and industry to help guide the implementation of his recommendations, embarking upon a comprehensive round of conferences, seminars, workshops, and one to one meetings with key shareholders [3.6].

References to the research

- 3.1.** Nielen, M.W.F., Elliott, C.T., Boyd, S.A., Courtheyn, D., Essers, M.L., Hooijerink, H.H., Van Bennekom, E.O., Fuchs, R.E.M. 2003. Identification of an unknown β -agonist in feed by liquid chromatography/bioassay/quadrupole time-of-flight tandem mass spectrometry with accurate mass measurement. *Rapid communications in mass spectrometry*, 17 (14), 1633-1641. <https://doi.org/10.1002/rcm.1099>
- 3.2.** Graham, S.F., Haughey, S.A., Ervin, R.M., Cancouët, E., Bell, S., Elliott, C.T. 2012. The application of near-infrared (NIR) and Raman spectroscopy to detect adulteration of oil used in animal feed production. *Food Chemistry*, 132 (3), pp. 1614-1619. 10.1016/j.foodchem.2011.11.136
- 3.3.** Chatterjee, N.S., Chevallier, O.P., Wielogorska, E., Black, C., Elliott, C.T. 2019. Simultaneous authentication of species identity and geographical origin of shrimps: Untargeted metabolomics to recurrent biomarker ions. *Journal of Chromatography A*, 1599, pp. 75-84.
- 3.4.** McGrath, T.F., Haughey, S.A., Patterson, J., Fauhl-Hassek, C., Donarski, J., Alewijn, M., van Ruth, S., Elliott, C.T. 2018. What are the scientific challenges in moving from targeted to non-

targeted methods for food fraud testing and how can they be addressed? – Spectroscopy case study. Trends in Food Science and Technology, 76, pp. 38-55.

3.5. Cavanna, D., Righetti, L., Elliott, C., Suman, M. 2018. The scientific challenges in moving from targeted to non-targeted mass spectrometric methods for food fraud analysis: A proposed validation workflow to bring about a harmonized approach. Trends in Food Science and Technology, 80, pp. 223-24.

3.6. Brooks, S., Elliott, C.T., Spence, M. et al. (2017) Four years post-horsegate: an update of measures and actions put in place following the horsemeat incident of 2013. NPJ Science of Food 1, 5 (2017).

4. Details of the impact

Industrial Impact: The Elliott Review **[5.1]**, commissioned following the European horsemeat scandal **[5.2; 5.3; 5.4]**, activated a nationwide adoption of a highly innovative approach to tackling food fraud, involving partnership between Government, regulators and industry. In a written statement to Parliament (2014) the Secretary of State for Environment, Food and Rural Affairs (Elizabeth Truss) confirmed:

'I welcome Professor Elliott's report and would like to thank him for his important work in this area. I accept all of his recommendations, many of which we are already implementing, we intend to act immediately with the Food Standards Agency to establish a food crime unit' [5.5].

The National Food Crime Unit (NFCU) was established in 2015 **[5.6, 5.7]**. It is a dedicated law enforcement function of the Food Standards Agency (FSA) and provides leadership on food crime across England, Wales and Northern Ireland. In parallel, the Scottish Food Crime and Incidents Unit (SFCIU), within Food Standards Scotland, was founded **[5.8]**.

In 2015, industry leaders established **the Food Industry Intelligence Network (FiiN)** (<https://www.fiin.co.uk/>) **[5.9]**. The network addresses the recommendations of the 'Elliott report' by providing a 'safe haven' for industry to collect, collate, analyse and disseminate information and intelligence, to protect the interests of the consumer. Professor Elliott was invited to join the FiiN Board as an independent scientific expert. Initially nineteen businesses across the UK joined FiiN, which was based on a fee paying membership model. A unique system was developed whereby all food authenticity testing data and intelligence was collected from member companies, sent to a law firm where it was anonymised then sent to the FiiN Board for analysis. The data was reviewed and converted into an intelligence package and supplied to all FiiN members.

Economic Impact: Food crime costs the UK economy around GBP1,200,000,000 each year. To help tackle this the Elliott Review recommended setting up the NFCU. In Phase 1 a budget of GBP2,000,000 per year was used to recruit a senior former police officer and an intelligence officer

from the National Crime Agency who then established a small team (~12 FTEs) to collect information on food crime and convert it into intelligence that informed 43 UK police forces [5.6]. The NFCU was the first new law enforcement agency introduced in the UK for over 25 years. Following an independent review of the business case in 2018, Phase 2 was implemented and GBP2,000,000 of additional funding was approved by government. The NFCU now has a workforce in excess of 80 officers located across the UK and works closely with police forces and intelligence agencies, playing a 'key leadership role' and an 'influential role in EU counter-fraud initiatives' [5.7]. In 2019, the Unit recorded 77 disruptions, each of which represents a tangible impact upon those involved in the commission of food crime [5.7]. The SFCIU also has 17 industry partners and a current workforce of 16 officers.

FiiN now has over 45 members and includes the UK's largest food companies with a combined turnover in excess of GBP115,000,000,000 [5.9]. FiiN members now base their entire food authenticity testing programmes on the data provided and recommendations made in quarterly reports. FiiN intelligence has resulted in more than 10 major investigations with several of these involving government agencies and police forces (further details cannot be provided due to legal reasons). Another important development was a Memorandum of Understandings with Government agencies in the UK (Food Standards Agency, Food Standards Scotland) and Ireland (Food Safety Authority), to facilitate the exchange of confidential intelligence around food fraud incidents. FiiN is the only such scheme that exists globally and a number of countries are attempting to replicate the model.

Societal Health Impact: The horsemeat scandal in January 2013 highlighted the vulnerability of the food industry, resulting in major impact on consumer confidence in meat products and a fall in confidence in supermarket products. The face value of the horsemeat scandal was GBP178,000 but police estimated that the true cost ran into millions of pounds [5.10]. A survey highlighted that 60% of consumers changed shopping habits, and their trust in the industry fell by 24%, with 30% buying less processed meat and 24% buying fewer ready meals containing meat. The Elliott Review underpinned a range of concerted, including first and foremost recommendation 1. 'Consumer first' encompassed ensuring that committing food crime is made as difficult as possible and putting consumer interests at the forefront. This resulted in the campaign 'Stop Food Fraud' calling on government, food standards agency and local authorities to help stop food fraud. Following the campaign and resultant government interventions, an improvement in consumer confidence in meat products was reported, with trust levels returning close to pre-horsegate levels [3.6; 5.11]

5. Sources to corroborate the impact

5.1 Final Elliott Report

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/264997/pb14089-elliott-review-interim-20131212.pdf

Document also attached.

5.2 Two men jailed in UK for horsemeat conspiracy

<https://www.theguardian.com/uk-news/2017/jul/31/two-men-jailed-in-uk-for-horsemeat-conspiracy>

5.3 Horsemeat scandal: four on trial in Paris accused of fraud

<https://www.theguardian.com/uk-news/2019/jan/21/horsemeat-scandal-paris-fraud-trial>

5.4 Horsemeat scandal: food safety expert warns issues have not been addressed

<https://www.theguardian.com/uk-news/2014/sep/04/horsemeat-food-safety-expert-chris-elliott>

5.5 Ministerial Statement - The Secretary of State for Environment, Food and Rural Affairs (Elizabeth Truss)

<https://publications.parliament.uk/pa/cm201415/cmhansrd/cm140904/wmstext/140904m0001.htm>

5.6 Establishment of NFCU phase 1

<https://www.food.gov.uk/about-us/national-food-crime-unit>

5.7 National Food Crime Unit – Update on Progress 21 Jan 2020 (PDF)

5.8 Establishment of Scottish Food Crime and Incidents Unit

https://www.foodstandards.gov.scot/downloads/Board_meeting_-_Update_on_the_creation_of_the_Scottish_Food_Crime_and_Incident_Unit.pdf

Document also attached.

5.9 The Food Industry Intelligence website: <https://www.fiin.co.uk/>

5.10 Evidence of the cost of the horsemeat scandal

<https://www.bbc.co.uk/news/uk-england-london-40775328>

5.11 Evidence of increased consumer confidence in meat post-Elliott review recommendations

<https://www.thegrocer.co.uk/buying-and-supplying/consumer-trust-meat-in-supermarkets-more-than-restaurants-claims-survey/517134.article>