

# Risk modelling of food fraud motivation - 'NSF fraud protection model' intelligent risk model scoping project

Area of research interest: [Food crime](#)

Study duration: 2013-06-01

Project code: FS102067

Conducted by: NSF International

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## Background

The rising trend in globalised food trade is creating both complexity in the supply network and an increased opportunity for food fraud. As a consequence, the food industry is under pressure from food fraudsters. It was reported in 2011 (see the 'External sites' link on this page) that organised crime is switching to food fraud from other illegal activities, because detection methods are less developed. Intelligence gathering to fight food fraud is being addressed internationally through a number of government-led initiatives but industry intelligence goes currently largely untapped. Furthermore, supermarket retailers and large food companies/manufacturers are finding the scale of food fraud detection and the range of products potentially affected challenging. The principal objective of this project was to enhance and develop a working version of a pre-existing model 'NSF fraud protection model' which has been developed to help reputable large scale food retailers and regulators anticipate the relative likelihood of fraudulent attack on the many and varied product lines offered to consumers.

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## Research Approach

With the aim of feeding into the development of the NSF fraud protection model, two major tasks were undertaken. The first was a detailed identification and review of other available tools and models being used for food fraud detection and prevention. The second was a survey and set of interviews of industry representatives to test the key assumptions underpinning the NSF fraud protection model, with subsequent validation by industry and regulators.

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## Results

The outcome of this project is a working prototype of the NSF fraud protection model that has been developed through interactive sessions between project team members and tested by presentation for feedback from industry and regulatory representatives.

The model being enhanced is conceptual. It arose from a request for help to assess and manage the scale of food fraud being encountered in 2013 by a global supermarket retailer to one of the project team, David Edwards, the then head of consulting at NSF International, a US based, not for profit, public health and safety organisation.

A key aspect of the NSF fraud protection model is that it approaches the issue of fraud from the perspective of what is advantageous to the fraudster. In other words, to help organisations ‘think like a criminal’. The assumption being that fraudsters involved in organised deception are more likely to target high value, easy to implement and difficult to detect adulterations/substitutions, in essence to target situations where they perceive the greatest return financially for the least effort and lowest likelihood of detection. (Opportunistic fraudsters could be predicted to not to conform to this model.)

These three main factors were considered in the original model:

- the potential profit a fraudster can make
- the potential difficulty/cost for the fraudster of making a viable substitution (opportunistically and technically)
- the likelihood of detection by a reputable food business customer or regulators

This project examined whether these initially proposed factors were appropriate. The aim was to create simple indicative criteria of scale (measurement indices) or modifications to the conceptual model such that food groups/categories can be mapped onto a four quadrant Boston Consulting Group (BCG) matrix-style framework. The intention is that the framework will provide a clear visual representation of relative product risk. This would enable easier and more consistent and prioritised targeting of surveillance measures, supply network controls and preventative interventions.

The project team designed a BCG-style matrix which places product groups in quadrants (see image below), with the top right quadrant containing products that are most attractive to a fraudster and bottom left being the least attractive. The size of each circle represents perceived difficulty to the perpetrator of undertaking the particular fraud.

In addition to prioritisation, the NSF fraud protection model also aims to provide a proactive approach to anticipating the potential for fraud since it helps identify relative vulnerability.

Research report

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PDF

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WORD

[View Appendix 1 Framework elaboration as Word\(Open in a new window\)](#) (525.91 KB)

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EXCEL

[View Appendix 2 industry interview responses NSF as Excel\(Open in a new window\)](#) (17.26 KB)

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[View Appendix 3 survey questions as PDF\(Open in a new window\)](#) (254.72 KB)

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[View Appendix 4 survey circulation list as Excel\(Open in a new window\)](#) (15.19 KB)

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[View Appendix 6 fraud database review as Excel\(Open in a new window\)](#) (197.13 KB)

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[View Appendix 7 literature internet survey as Word\(Open in a new window\)](#) (777.52 KB)