

Development of a Food Recall Prevention Platform

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

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Background

The majority of UK food recalls are due to allergen mislabelling, misleading allergen claims and/or the unintentional presence of allergens – representing a significant food safety risk and cost to industry. Labelling legislation must be followed to ensure food is safe and what it says it is, and this requires good allergen management and accurate allergen information communication down the supply chain. Distilling this information accurately, to inform labelling and/or communication of allergen information, can be particularly challenging for small to medium food businesses due to the low adoption of advanced labelling technology.

In November 2018, a joint FSA/EIT (European Institute of Innovation & Technology) workshop discussed potential solutions to tackling the increase in food allergen mislabelling incidents. It was concluded that the situation could be improved by developing accessible and affordable tools for food businesses, to aid in the automation of food data collection, validation and management.

As a result, the FSA are funding this initial development project that aims to develop an online system targeted at small and medium-sized food businesses, to help reduce the number of product recalls due to allergen mislabelling. The tool is also predicted to support more reliable knowledge transfer and incident tracking when things do go wrong.

Objectives and Approach

The project's main objective is to:

- develop an online software to help Food Business Operators (FBO) collect ingredient and food allergen data from their suppliers, provide tools to validate ingredient data, and enable consistent and accurate transfer of food allergen labelling data along the supply chain

This will aim to:

- reduce the number of mislabelling errors
- improve the accuracy and efficiency of food data collection and food traceability

The foundation of this project is based on analysis of [food allergy alerts published on food.gov.uk](#) between 2016-2019. This analysis will provide insights into the pattern and causes of food allergen related product recall alerts in the UK, to inform priority areas.

Once major causes of mislabelling are identified, advanced business value mapping tools will be used to develop a strategic framework to eliminate food recalls, cost-effectively. The framework will map out value exchanges among various food safety stakeholders (e.g. food labelling software developers, food companies and nutritional data scientists) in reducing food allergen recalls and identify their incentives to help food companies improve food allergen management.

Next, a food allergen labelling database will be designed to help food businesses collect food information and ensure the correct declaration of food allergens. This work will focus on improving the accuracy and completeness of food allergen data for food labelling. The proposed approach will enable better food allergen communication along the supply chain through reinforcing business-to-business communications. This will be achieved via the use of an aggregated database which will provide transparent food allergen information for food products along the supply chain.

The project approach is designed for applying to the wider food industry to improve the accuracy of allergen information across FBOs but in particular for Small and Medium Enterprises (SMEs), where advanced labelling techniques may not be so widely adopted or accessible. The focus of this work is to address food mislabelling, packaging errors, and reduce accidental human and software errors in the process.

Results

Overall, the project found that 92% of food allergy alerts are caused by operational errors internal to food businesses meaning we can prevent food allergy alerts by improving food allergen management.

Scoping review

The first part of the project was to conduct a scoping literature review on the causes of food allergy alerts. This review found that mislabelling was the biggest cause of food allergy alerts (accounted for 54% of total allergy alerts), followed by wrong packaging and food allergen contamination accounting for 19% and 14% respectively. Overall, the food allergy alerts caused by internal factors (91.5%) amount to more than ten times of those caused by external factors (8.5%).

Behavioural incentives

The study found that food businesses can be motivated to improve food allergen management by increasing behavioural benefits and decreasing behavioural costs of food allergen managements. This means that unlocking behavioural incentives of food businesses has a great potential for reducing food allergy alerts. The project identified various behavioural incentives of food allergen management that may benefit internal and external stakeholders such as economic, social and environmental. Furthermore, a good understanding and knowledge of food allergen management can prevent potential risks from the design phase. The study identified environmental incentives such as cutting food waste and CO2 emissions as a key behavioural intensive.

Prototype of a digital platform

The study developed a pilot digital platform for automating data exchange between different FBOs to improve efficiency and accuracy of food data verifications, thereby preventing food allergy alerts.

The platform uses an incentive-based approach to preventing food allergy alerts. It contains (a) an incentive-based food traceability system which provides a coherent framework for embedding behavioural incentive into the design of food traceability technology; (b) a standardised food product information form; and (c) a prototype of digital platform.

Publications

Jia, L. and Evans, S., 2021. [Improving food allergen management in food manufacturing: An incentive-based approach. Food Control, 129, p.108246.](#)

Research report

PDF

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