## Food Handler Awareness of Allergen Management Systems in Welsh Food Manufacturing Businesses Leanne Ellis\*, Ginnie Winter, Helen Taylor and Ellen W. Evans **ZERO2FIVE Food Industry Centre Food and Drink Research Unit** Food Protection for AFP 2019 Cardiff Metropolitan University ZERO2FRUE Canolfan Diwwdiant Rwyd Canolfan Diwwdiant Rwyd Cardiff Metropolitan University, Wales, United Kingdom.



Introduction

In order to address the skills shortage in the sector it has been acknowledged by the ZERO2FIVE Food Industry Centre that first line managers, engineers and non-food science graduates in the businesses require personal development in areas of third party compliance in order to improve knowledge and skills to enable growth in the sector.

Food and drink manufacturing businesses are legally required to train food handlers and manage allergens onsite; Regulation (EC) No. 852/2004 on the hygiene of foodstuffs requires businesses that handle food to ensure food handlers are supervised and instructed and/or trained in food hygiene matters commensurate with their work activity (Hygiene of Food stuffs, 2004). Similarly, the British Retail Consortium (BRC) Global Food Safety Standard requires businesses to ensure all staff are trained effectively and requires management of allergens too. Although research regarding allergen awareness of food handlers in restaurants is available, data detailing food handler awareness of allergen management systems in foodmanufacturing environments is lacking.

BRC Global Food Safety standard requires business to ensure all staff are trained effectively. This 'Fundamental' requirement is detailed in section 7.1 (fundamental) of the standard. The company shall ensure that all personnel performing work that affects product safety, legality and quality are demonstrably competent to carry out their activities, through training, work experience or qualification (BRC Global Standards, 2015).

Although the prevalence of training has increased and the level of hygiene qualifications improved, there is still a need to develop proven training to change workplace knowledge and behaviour (Mortlock, 2014).

### Purpose

To understand food handler awareness of the management of allergens. To significantly improve food handler awareness, confidence and understanding allergens and the severity of poor management,

# Methods

**Recruitment:** An inclusion/exclusion method of selection was used. A list of criteria was developed to include geographical area, small to medium enterprises (SME) status and certification was constructed and companies who met the criteria were contacted via the Wales Food and Drink Producers Directory (Food Innovation Wales, 2019). The participants were food-handlers (n=51) from food-manufacturing businesses in Wales (n=10) who participated a short course covering the five themes of the BRC guidelines for allergen management in food manufacturing: significance of process, suppliers, separation, scheduling and sanitation.

**Intervention**: A bespoke allergen management intervention was developed inline with legal requirements and BRC certification.

**Data Collection:** Food handler knowledge was measured pre- and post-intervention, and technical managers (*n*=4) were interviewed regarding intervention impact and effectiveness (four to eight weeks post-intervention).

**Ethical Approval:** Approval was obtained from the Health Care and Food, Ethics Panel at Cardiff Metropolitan University.

A bespoke training intervention was delivered to 51 first line managers. The training was delivered over a period of two hours, and included bespoke and practical activities which involved reviewing each food and drink manufacturing businesses' allergen management procedure. The training was delivered by food technologists who specialise in BRC, either onsite (if available) or nearby, reducing the time impact on the business.

Technical and operational managers across 10 food and drink manufacturing businesses that oversee 6-38 people each (194 in total), selected first line management intervention training. Participating companies were certified with a mixture of accreditations (9 of the 10 companies hold BRC certification).

An assessment tool to measure the knowledge of trainees who attended the intervention training was completed; the results are collated in table 1. Statistically significant data are shown as p<0.05 and highly significant as p<0.001, alternatively, p>0.05 shows an insignificant change. The 1-10 scale refers to 1 = strongly disagree and 10 = strongly agree. The results are shown in table 1. Data in bold shows statistically significant data.

Table 1: Trainees agreement with the knowledge and behaviour statements pre and post intervention (n = 54)

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Paperwork and documentation A Wilcoxon signed rank test revealed a statistically significant increase in food handlers familiarity with the company's allergen management procedures following the training intervention (p<0.05), the results are shown in table 1. If food handlers are more familiar with procedures they could have a better understanding of the process of allergen management, lowering the risk of errors.

Table 1 shows that confidence in awareness of allergen management paperwork increased post intervention (p<0.001) and using allergen management paperwork significantly increased (p<0.001). The pre intervention results highlight a concern in paperwork completion, if food handlers are not confident, can they be sure they are completing it correctly? The intervention significantly increased confidence in food handlers, however, extra training maybe require to ensure that 100% of food handlers are confident in paperwork, as paperwork is used as evidence in case of due diligence.

Confidence in the ability to list allergen documentation increased (p<0.001) as did food handlers confidence in knowing allergen management responsibilities (p<0.001) with a medium effect, showing an improved knowledge of the types of documentation and importantly, their own specific responsibility.

Understanding the risk Food handlers were asked to name consequences of poor allergen management. Pre intervention n=46 food handlers attempted the question giving 79 of a possible 102 correct answers. Post intervention, more food handlers attempted the questions (n=49) giving 95 correct answers, a significant increase (p<0.05) with a small effect. This increase is important because the food handlers are more aware of the potential risk to the consumer and the company.

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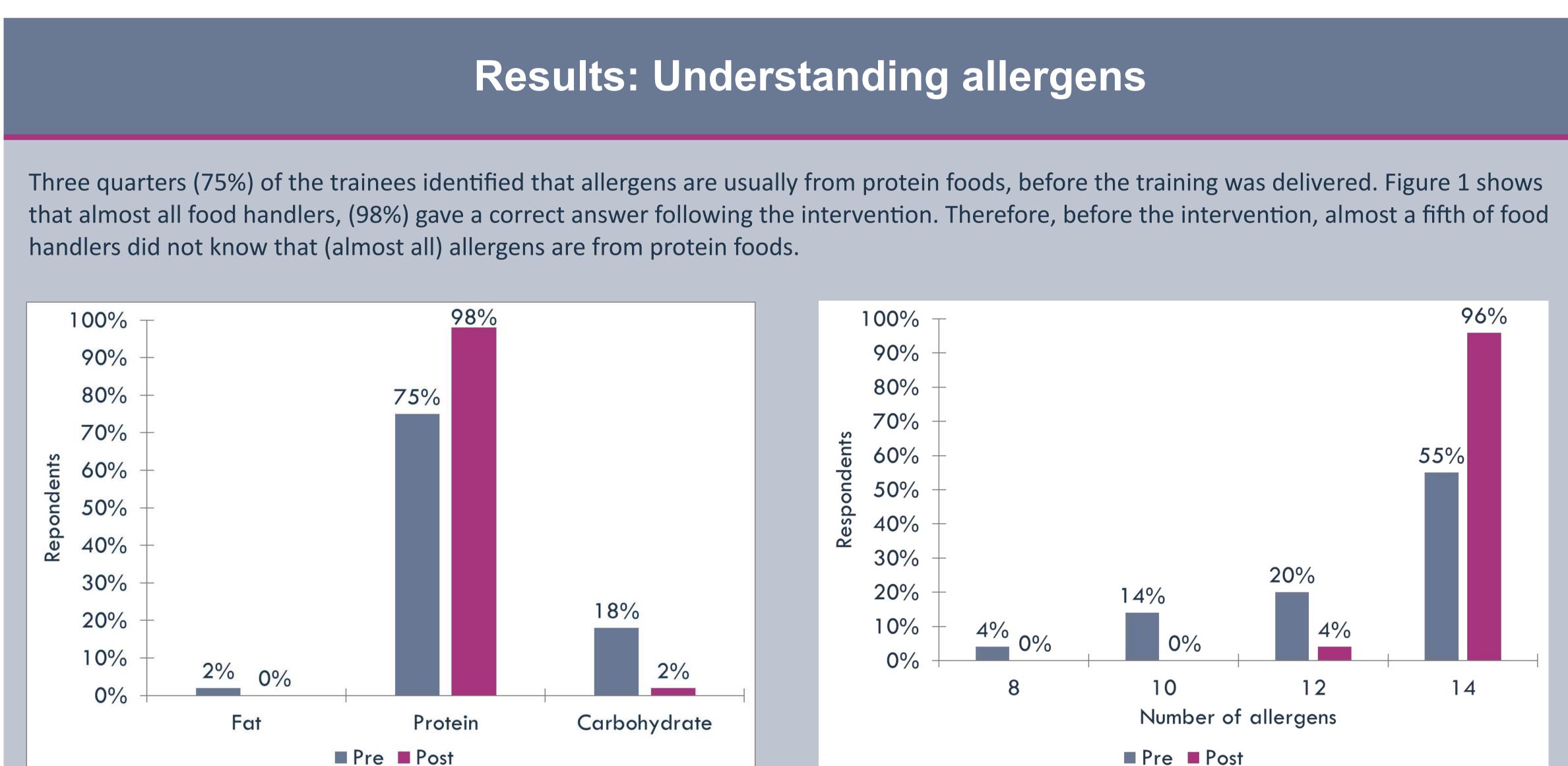
# Approach

### Results: Risk and the importance of paperwork

Pre	Post	Significant differences
<b>49%</b>	82%	<pre>p &lt; 0.005, z = -2.943, r = 0.291 (small effect)</pre>
41%	78%	<i>p</i> < 0.001, <i>z</i> = -3.63, <i>r</i> = 0.359 (medium effect)
37%	78%	<i>p</i> < 0.001, <i>z</i> = -3.92, <i>r</i> = 0.38 (medium effect)
43%	67%	<i>p</i> > 0.05
57%	88%	<pre>p &lt; 0.05, z = -1.901, r = 0.188 (small effect)</pre>
25%	75%	<i>p</i> < 0.001, <i>z</i> = -4.42, <i>r</i> =0.438 (medium effect)
51%	90%	<i>p</i> < 0.05, <i>z</i> = -3.093, <i>r</i> = 0.306 (medium effect)
	49% 41% 37% 57% 25%	49%       82%         41%       78%         37%       78%         43%       67%         57%       88%         25%       75%

\*please note that these questions were reversed to reduce the likelihood of the respondent misreading question.

<sup>1</sup>Significant data are shown as *p*<0.05 and highly significant as *p*<0.001, alternatively, *p*.0.05 shows an insignificant change.



### Figure 1: Awareness of the macronutrient associated with allergens



Figure 2 shows that more than half (55%) food handlers could identify how many allergens are defined under EU legislation indicating poor knowledge of the variety of potential hazards. Following the intervention, almost all food handlers were able to correctly identify that there are 14 allergens (96%) improving the knowledge of the cohort and therefore increasing knowledge.

Food handlers were asked to name three allergens, identified under EU legislation, handled on their site. Before the intervention collectively they identified 111 of 153 possible correct answers. Post intervention, this increased to 149 of 153 correct answers. Knowledge of onsite allergens was improved, following the intervention, demonstrating that a short two hour training intervention can have a critical effect on food handler knowledge.

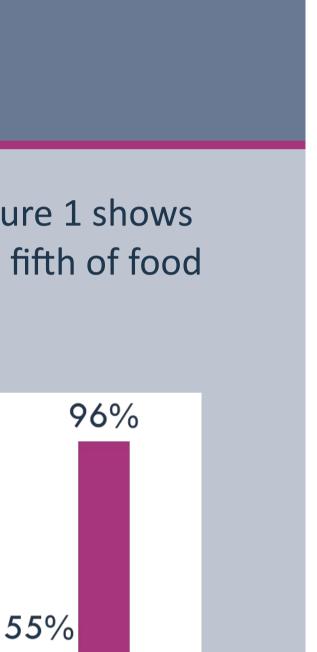
Food handlers were asked to name three symptoms of allergenic reactions. Food handlers identified 132 of 153 possible correct answers. Following the intervention food handlers identified 150 of 153 correct answers, making them more informed of the risks. However, few were able to identify anaphylactic reactions regardless of the intervention.

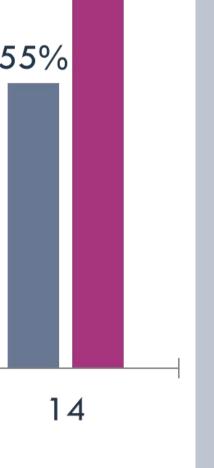
Following the intervention (4-6 weeks later) technical managers were asked to comment on whether they could see the benefits of this intervention. All technical managers had seen an improvement in food handlers and even though the training was short it covered relevant issues and the format. Technical managers commented on the importance of the intervention being flexible and set at an appropriate level for the food handlers to understand. Figure 3 shows quotes from some of the technical managers following the intervention.











# Significance of study

This study designed and developed, implemented and evaluated a bespoke training

The assessment of knowledge before the intervention highlighted concerns in the lack of understanding of what can be detrimental to those who suffer with severe allergies. It also emphasised unfamiliarity with vital documentation and food handlers lack of recognition of their own responsibilities.

In just two hours this bespoke intervention significantly improved the knowledge and practices of first line managers in a number of different allergen management areas.

It significantly enhanced familiarity and understanding of allergen management. Improving knowledge of allergens and the risk to those with allergies. It also highlighted the consequences of poor management and how detrimental this could be to the consumer and the business, if it is not conducted precisely.

Finally, trainees understand their responsibility more clearly enabling them to be more effective and increasing confidence. The intervention was perceived to be effective and technical managers were satisfied with the improved knowledge of their food handlers.

# Acknowledgements

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## References

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