UNIVERSITY OF BIRMINGHAM

Analysing Food Business Managers' attitudes to a hypothetical change in food allergy law: "Owen's Law"

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Abstract

Introduction

Food allergy law in the UK is driven by EC 1169/2011, and enforced by the Food Information Regulations 2014. However these laws have multiple points of failure which have led to deaths of Shahida Shahid and Owen Carey, with similarities in the cases showing that lessons were not learned in the years in between, and that customers with allergies are still at risk.

Literature Review

With no known cause or cure of food allergies, no preventative treatment and adrenaline auto-injectors as the only reactive cure, the transfer of accurate information is key to ensuring the safety of customers with allergies. However, this provides the opportunity for businesses, servers, or customers themselves to make mistakes that put their safety at risk. The family of Owen Carey propose a law change, Owen's Law, which would improve the safety of customers if it were to be implemented.

Aims

This study aims to investigate how this change would affect managers of food business' confidence in serving customers with allergies safely, and what benefits and problems they foresee. Therefore, tweaks could be suggested to the proposed law change to allay these problems.

Research Methods

This study used a questionnaire to ask open and closed questions, and statistical and thematic analysis of the responses was conducted.

Results

Managers confidence of serving customers safely was significantly reduced under Owen's Law, but with benefits and problems clearly identified and categorised.

Discussion

While it is clear that this law change would benefit allergy customers, slight tweaks could be made to it to increase their safety while increasing the ease at which businesses could comply with Owen's Law.

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Chapter 1

1.0 Introduction

In January 2015, Shahida Shahid ordered a chicken burger after informing the staff at Almost Famous Burgers that she had a milk allergy (BBC, 2015). Shahida was however served chicken that had been marinated in buttermilk containing cow's milk. Shahida began to feel ill shortly afterwards and collapsed, with her friend administering an EpiPen that was ineffective due to it being out of date. Shahida was taken to hospital, but ultimately died three days later due to brain injuries following a cardiac arrest (BBC 2018a).

Two years later in April 2017, Owen Carey ordered a chicken burger after telling the staff at Byron Burgers that he had a milk allergy (BBC, 2019). Owen was also served chicken that had been marinated in buttermilk containing cow's milk. Owen only ate a mouthful, as he immediately knew something was wrong as his lips started to tingle and his breathing quickened. An hour later, Owen collapsed, dying due to anaphylactic shock (BBC 2023a).

The similarities in both cases show that the mistakes made causing Shahid's death in 2015 had not been learned from. Both Shahid and Carey told the staff that they had milk allergies, both ordered chicken burgers due to the word "grilled" being used on the menus and no mention of any marinade, and both died due to errors made by the staff at the restaurants. Despite these cases, the law relating to ordering in restaurants has not changed. There must be written notices on the menus that customers with allergies should make their server aware, and the restaurant must be able to account for all items on the menu that contain any of the 14 allergens outlined in Annex II of EU Regulation 1169/2011 (Regulation (EU) Number 1169/20111; The Food Information Regulations 2014). This however provides opportunities for human error from customers with food allergies themselves or by restaurant staff to put the lives of customers at risk. If customers with food allergies fail to mention their allergy either due to forgetting or being too shy to mention, they are at an increased risk. If front of house staff either misread or misunderstand the allergy guide or fail to communicate to back of house staff, it will again put allergic individuals at an increased risk. The family of Owen Carey have proposed a change in food allergy law, Owen's Law, which they say could help reduce the risk posed to allergic individuals. They have proposed that the 14 Allergens outlined in Annex II of EC 1169/2011 must be outlined in writing without the customer needing to ask (BBC 2023b). Several examples of how this could be done are provided, for example either writing the allergens in full or using numbers of symbols with a corresponding key (Owen's Law, 2023).

This chapter will review literature surrounding the lack of knowledge of the causes of allergies, the rising prevalence of food allergies, the differences in prevalence in adults and children and their potential implications, and the rising rates of hospitalisation due to food allergy.

2.0 Literature Review

2.1 The Unknown Cause, and Unknown Cure of Food Allergies

Although many risk factors that increase the likelihood of developing food allergies have been identified, and the mechanism of the development is understood, it is not known what causes the body to begin this process and why. This mechanism is outlined in Table 1. Once an individual is allergic to food, there is a range of severity of symptoms. The most extreme is food anaphylaxis, a rapid onset reaction caused by an allergy to otherwise harmless proteins in specific foods (Turner et al, 2019). The effects can be life-threatening, with symptoms affecting the respiratory, cardiovascular, gastrointestinal, and neurological symptoms (Anagnostou, 2018).

Sensitisation Phase
Initial Exposure: The person is first exposed to a food allergen
Antigen Presentation: Dendritic cells in the gut present the food protein to T-helper cells
IgE production: The T-helper cells stimulate the production and release of IgE antibodies specific to the food allergen
Reaction Phase
Subsequent Exposure: Once the food is eaten again, the allergen binds to the IgE antibodies
Release of Mediators: IgE antibodies release inflammatory mediators including histamines
Symptom Phase
Immediate Symptoms - Release of histamine causes dilation of blood vessels, increased vascular permeability, and contraction of muscles. This results in hives, swelling, itching, breathing problems and gastrointestinal distress
Anaphylactic Symptoms - Release of histamine causes Food Anaphylaxis: drop in blood pressure, airway constriction, loss of consciousness

Table 1 - The mechanism by which food allergies develop in humans (Valenta et al, 2015).

Many risk factors for increased occurrence of food allergies have been identified. Vitamin D plays a regulatory role in the immune system, reducing the risk of T-helper cells over-reacting to stimuli, and children with lower natural Vitamin D levels have been found to have higher rates of food allergies (Bozzetto et al, 2012).

The increase in hygiene levels in recent years have led to lower levels of exposure to infectious agents, including parasitic infections (Cruz et al, 2017). Cruz outlines that parasitic infections, particularly helminths, stimulate a T-helper immune response. Exposure helps balance T-helper response, therefore a reduction in exposure can lead to T-helper over-reaction which therefore increases the risk of food allergy development.

Co-exposure of allergens in the atmosphere with particulate matter (PM) air pollution has also been identified as a risk factor. PM induces inflammation which can lead to changes in immune responses (Zhang et al, 2023). Zhang shows that PM exposure in rats can stimulate higher levels of production of T-helper cells, therefore increasing the chance of the

production of IgE antibodies if exposure to food proteins co-exists. This effect has only been shown in rats however, therefore it is unclear if the effect would even occur in humans, and if it would how high the levels of exposure would need to be to produce a similar effect.

There is no known cure for food allergies. The only approach to reducing the instances of anaphylaxis is for individuals with allergies to avoid eating the food they are allergic to. If they do suffer Food Anaphylaxis, all that can be done to help save lives is to inject adrenaline, or epinephrine as it is called in American literature (Macias-Weimann et al, 2021). Adrenaline causes the constriction of blood vessels, raises blood pressure, relaxes airways, reduces swelling, inhibits the production of further histamine, and increases heart rate, all of which counteract the anaphylactic symptoms caused by food allergies very quickly (Shaker et al, 2020).

2.1.1 The Problems with Adrenaline Injections

Adrenaline Injectors, commonly referred to as a famous brand name EpiPens, can be ineffective for a number of reasons. In the case of Shahida Shahid's death, her injection was ineffective due to it being out of date (BBC, 2018a). This therefore shows the responsibility for tracking the use by dates and replacing the injectors falls on the allergic individuals, providing an opportunity for individual mistakes to risk lives. In the case of Owen Carey's death, Carey had forgotten his injector (BBC, 2023a). This again shows the responsibility for having their injector on them at all times, and provides opportunities for mistakes to risk lives.

Another famous allergy death is that of Natasha Ednan-Laperouse, who died following an anaphylactic reaction to sesame present in a baguette purchased from an airport branch of Pret a Manger (BBC, 2018b). In this case, Ednan-Laperouse's father administered her EpiPen, but the needle was too short and the dose too small due to the fact that the EpiPen was suitable for Natasha when she was younger, and as she was now 15 the needle wasn't long enough and the dose not large enough (BBC, 2018b). This again puts responsibility on individuals and their families to regularly update their EpiPens, and allows mistakes to put lives at risk.

The regular updates that are required come at a cost to the individuals and their families. To purchase EpiPens, a pack of 1 costs £53.80, and a pack of 2 costs £107.60 (NHSBSA, 2023). This is an expense not experienced by individuals without allergies, and if those with

allergies cannot afford to purchase updated EpiPens when they go out of date or their child grows and ages, the life of the individual will be put at risk.

As there is no known cause of food allergies, no known cure, and multiple problems with the reactive treatment of EpiPens, it is vital that allergic individuals must avoid eating food that they are allergic to. This therefore relies on the reliable transfer of accurate information when food is being purchased.

2.2 Food Allergies and Anaphylaxis Prevalence

2.2.1 Estimates by hospital data

In the UK, it is estimated that approximately 10% of adults have at least one food allergy, and prevalence is higher in children (Turner et al, 2020). These rates have been increasing in recent decades, and the rate of increase has been higher in highly industrialised countries such as the UK than less industrialised parts of the world (Leung et al, 2018).
The fact that prevalence of food allergies is higher in children than adults has two implications. Firstly, some food hypersensitivities that are present in children are capable of disappearing as children age (Mahdavinia, 2020). This has been shown to be the case with hypersensitivities to egg, milk and soya (Iweala et al, 2018). Iweala did however show that fish, tree nut and peanut allergies were likely to be permanent.
However it could also be implied that as the current generation of children, with their higher rates of allergies than the current generation of adults, become adults they will have a higher prevalence of food allergies than the current generation of adults. Rates of hospitalisation due to food induced anaphylaxis would suggest this is the case, as they have been increasing significantly among under 60s in recent years, particularly among those aged under 14 (Conrado et al, 2021). This is shown in Figure 1. Some of this data is explained by the National Institute for Health and Care Excellence (NICE) issuing guidance in 2011 that all children under 16 that suffer suspected anaphylaxis should be admitted to hospital (NICE, 2011). However, the fact that the rates of hospitalisation in under 16s has continued to increase shows that this guidance has not impacted the years that have followed 2011. Conrado did show that the rate of death following a hospital admission is falling, with 152 deaths identified in the 20 year study as being due to food induced anaphylaxis.

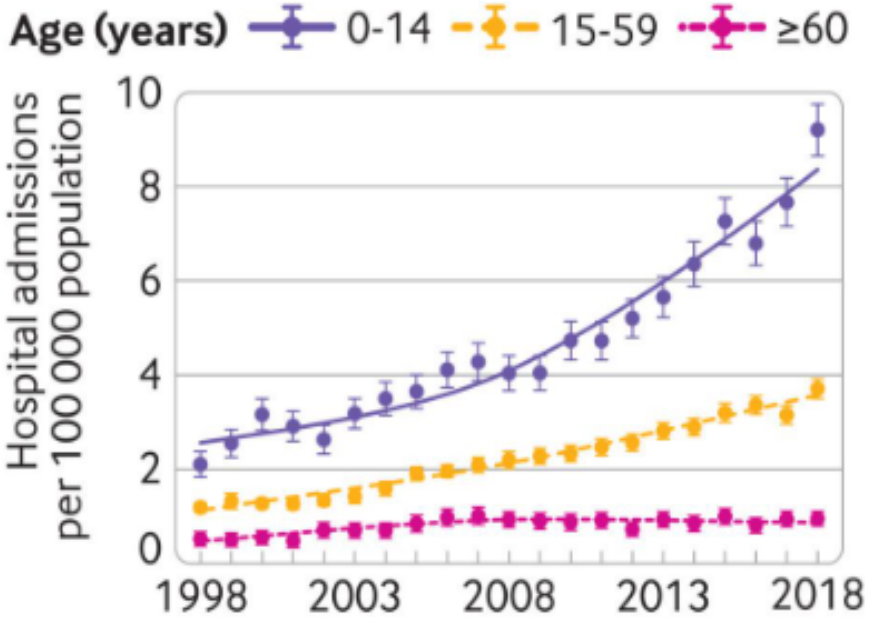

Figure 1 - Time trends in hospital admissions due to food induced anaphylaxis per 100,000 population from 1998 to 2018 by age (Conrado et al, 2021).

2.2.2 Estimates by Quota Sampling

In May 2024, the Manchester Asthma and Allergy Study used a quota sample to create a sample representative of the UK population in terms of age, gender, index of deprivation, and ethnicity (FSA, 2024). Their data found that 5.73% of the population have a confirmed IgE-mediated food allergy, with a further 7.44% having a possible but unconfirmed IgE-mediated food allergy.

2.3 Food anaphylaxis in restaurant settings

Of the 152 deaths identified by Conrado, 20% of these deaths occurred when the food was eaten in a restaurant (Soon, 2020), with 59% of the total food anaphylaxis incidents (fatal and non-fatal) incidents in the UK occurring where the food was eaten in a restaurant (Baker, 2018). Restaurant eating provides a higher risk for food allergy exposure and therefore food anaphylaxis for a number of reasons. The most obvious reason is that the food is not prepared by the allergic individual or their family. In a home setting, families buy most of their food from supermarkets where the products are labelled with allergens listed in bold type, so the risk of buying a product containing an allergen is lower (Boyd, 2018). Therefore when somebody else prepares food, the allergic individual is less informed on what the dish

contains.Restaurant staff often have knowledge gaps on which dishes contain which allergens, and although almost all receive training it is often only short and rarely refreshed (Soon, 2020). Soon also identified that high levels of staff turnover, a young average age of employees, and a lack of time dedicated to training also lead to knowledge gaps among staff. Teenagers with food allergies are particularly at risk in restaurant settings for a number of reasons. As teenagers transition from childhood into young adulthood, they begin to rely on their parents less and less and therefore begin to take the management of their food allergy into their own hands, which increases the risk of exposure as they have less experience in managing a food allergy (Stankovich et al, 2023). Teenage years are the years in which people show the highest rates of risk taking behaviour, and this is also seen with attitudes to food allergies (Vazquez-Ortiz et al, 2020). Teenagers also eat a larger proportion of their food in restaurants than adults and are less likely to carry adrenaline injectors (Herbert et al, 2021).

2.4 Current UK law regarding allergen information in restaurants

The current UK law regarding allergen information in restaurants is driven by EC 1169/2011, and enforced through The Food Information Regulations 2014. These two pieces of legislation outline that restaurants must display notices on the menus that any individual who suffers from a food allergy should inform a member of staff, and that the restaurant must have a method of communicating any presence in any menu item of the 14 allergens that are outlined in Annex II of EC 1169/2011. These 14 allergens are outlined in Table 2. The 14 allergens are focussed on due to their increased risk to a larger proportion of the population due to the incidence and severity of allergies to these foods.

Allergens outlines in Annex II of EC 1169/2011
Cereals containing gluten, and products thereof
Crustaceans, and products thereof
Eggs, and products thereof
Fish, and products thereof
Peanuts, and products thereof
Soybeans, and products thereof
Milk, and products thereof
Nuts, and products thereof
Celery, and products thereof
Mustard, and products thereof
Sesame, and products thereof
Sulphur Dioxide, and products thereof
Lupin, and products thereof
Molluscs, and products thereof

Table 2 - The 14 allergens outlined in Annex II of EC 1169/2011 (Regulation (EU) Number 1169/20111).

This law provides the opportunity for human error to put the lives of allergic individuals at risk. Firstly, as occurred in the incidents leading to the deaths of Shahida Shahid and Owen Carey, the staff can make errors which leads to an individual being served an item of food they are allergic to, even though the staff are made aware of the allergy. Secondly, the individual themselves can make a mistake. They may forget or be too shy to mention their allergy, and have been shown to withhold information for fear of social embarrassment, reduced choice of restaurants and menu items, and being refused service, all of which would not give the restaurant the opportunity to make their meal safe for them to eat (Barnett et al, 2018). The uncertainties around how safe it is for allergic individuals to eat out in

restaurants and the high levels of media attention that incidents leading to death receive have led to allergic individuals having lower confidence in eating at restaurants, and eating at restaurants less frequently than non-allergic individuals of a similar age and socio-economic status (Šálková and Tichá, 2020). This is therefore a gap in the market that restaurants cannot afford to be missing out on. With the prevalence of food allergies ever increasing, and restaurants generally still not performing at pre-pandemic levels (Gomes et al, 2022), a change in allergy information law to increase allergic individual's confidence to be able to eat at restaurants safely would increase their safety, and could have long-term impact on the profitability of the restaurant sector. Restaurants are not only missing out on selling their service to the allergic individual, but their friends and family may choose to eat and celebrate events in other settings. This therefore leads to a large number of people that restaurants are missing out on, due to a lack of confidence that they will be able to eat safely.

2.5 "Owen's Law"

The family of Owen Carey have started a campaign to change the law surrounding allergen information in restaurants, "Owen's Law" (Owen's Law, 2023). The family have proposed that the 14 allergens should be outlined in writing on the customer facing menu, whether that be using the full words, or numbers or symbols with a key. The restaurants would also need to have a matrix breaking down each menu item into its individual ingredients. This is already the case for pre-packaged foods, following the introduction of Natasha's law which was passed into legislation following the death of Natasha Ednan-Laperouse (GOV.UK, 2021). The family states that this law change would increase customer safety and confidence, as the customer would have full visibility on what they are ordering and the potential for human error to cause somebody to be served something they are allergic to is significantly reduced.

In December 2023, the Food Standards Agency (FSA) backed calls for Owen's Law to be introduced (FSA, 2023). The backing was due to their own research, engagement with allergic individuals and with food business operators. No confirmation on whether or not this law will be implemented in the UK has been received yet though.

Although it isn't called Owen's Law, this set of legislation would be identical to the current law regarding allergen information in restaurants in the Republic of Ireland. The Food Safety Authority of Ireland provides free access to a piece of software called MenuCal, which allows businesses to input their menu items and it calculates their calorific information and allergen information that they must then display (FSAI, 2024). The campaign website for Owen's Law

contains some research conducted by Owen's father Paul, and University of Birmingham lecturer Iain Ferris, in which they visited a variety of food businesses to assess compliance with this law (Ferris & Carey, 2023). The vast majority of businesses visited were independently owned, who in theory should find compliance with these laws more difficult as there is less budget and less in-house expertise available to them to ensure they comply. However, a high level of compliance was found with a significant improvement found compared to a similar 2017 study. The businesses reported that although an initial investment of time and money was required to access and assemble the necessary information, the laws were not difficult to comply with and having consistent suppliers and ingredients made them easier to comply with.

The high levels of compliance found in Ireland would suggest that an implementation of Owen's Law is possible and feasible. The success of a similar law in Ireland, and the outlined increase in safety and confidence of customers, and therefore long-term profitability of restaurants would suggest that an introduction of this law would help all parties.

Although it is clear how this change would benefit allergic individuals, it is unclear how receptive to this change managers of food businesses in the UK would be, how easy they think this change would be to comply with, and what problems they foresee were this law to change.

Chapter 2

This chapter will outline the aims and objectives of this research, and the hypotheses that will be tested to address these aims and objectives. The methodology will be outlined, with the research method, sampling method, and planned statistical analysis outlined. The expected benefits of this research will also be outlined.

3.0 Aims & Objectives

This research project will outline the following aims.

1. To analyse managers of food businesses' attitudes to a hypothetical introduction of Owen's Law.

2. To identify any recurring trends in the expected benefits and expected problems provided by managers of food businesses in the UK.

3. To provide suggestions for improvements that would ease concerns held by managers of food businesses.

In order to address aim 1, the following objective will be targeted.

1. To analyse how confident managers of food businesses in the UK are in serving allergic individuals safely under the current regulations, and whether or not that confidence increases or decreases following the introduction of Owen's Law.

In order to address aim 2, the following objective will be targeted.

2. To use open questions to provide an opportunity for managers of food businesses in the UK to provide their thoughts regarding any potential problems and benefits that the introduction of Owen's Law would provide.

In order to address aim 3, the following objective will be targeted.

3. Following analysis of the trends of responses provided as expected problems, suggestions of changes to the law will be provided, so as to reduce the concerns

held by food business managers but without reducing the safety of allergic individuals.

3.1 Hypotheses

Regarding Aim 1, the hypotheses are as follows

Null Hypothesis - Managers of food businesses' confidence of serving customers with allergies would not be changed by an introduction of Owen's law.
Alternative Hypothesis - Managers of food businesses' confidence of serving customers with allergies would be increased by an introduction of Owen's law.

4.0 Methodology

4.1 Research Method

The most appropriate research method to answer these aims is to use a questionnaire using both Likert scales and open questions. Questionnaires are suitable to be used when the research aims to profile a sample of a population according to the frequency of occurrence of opinions or attitudes (Rowley, 2014). This is the case with this research, as it is intended that a sample will be taken of managers of food businesses, and find their current opinions and attitudes to the safety of allergic individuals eating in restaurants. The hypothetical introduction of Owen's Law will then be introduced, and opinions and attitudes to this law and any changes to their opinions and attitudes to the safety of allergic individuals eating in restaurants could be assessed. Likert scale questions would be suitable to gather data to achieve aim 1. Likert scale questions are most frequently used to assess psychological questions, often ranging from one extreme to the other (Nemoto & Beglar, 2013). This therefore would be appropriate for this research as opinions and attitudes towards customer safety are a psychological issue as the concerns can only be accessed by imagining scenarios in which either extreme is realised, suffering of food allergy exposure or safety.

In order to access data to achieve aim 2, open questions will need to be asked. Open questions will allow for participants to expand or explain any answers given to the Likert scale questions, and to outline any concerns that they have. Open questions provide rich and meaningful data, which will allow participants to explore their thoughts and beliefs that are driving their opinions and attitudes (Krosnick, 2018). This is suitable to gather data to

address aim 2, as in order to find trends in concerns, the participants will need to be allowed to deeply explore their beliefs.

A questionnaire will be produced for managers of food businesses. The questionnaires will explain the purpose of the study to acquire informed consent, as no deception of participants is needed. Participants will be reminded at the end of their right to withdraw their data from the study, and the importance of anonymising the data will be reaffirmed as allergic individuals will be describing an aspect of their medical history.

4.2 Questionnaire Design

4.2.1 General Questions

At the beginning of the questionnaire, there will be some general questions. Participants will be asked how familiar they are with the case of the death of Owen Carey, and the associated campaign to change the law. Participants will also be asked if any of the steps that would be required under Owen's Law are currently in place in their business, so as to assess how feasible an introduction of Owen's Law would be in the UK. Participants will also be asked if they accept or buy substitutes products, and how often they check whether or not these substituted products introduce any new allergens to their products.

4.2.2 Confidence in Serving Allergic Individuals Safely

The questionnaire will ask the participants how confident they are in the ability of them and their teams to serve allergic individuals consistently safely under the current law as a baseline score. The participants will then be introduced to the hypothetical change, Owen's Law, and asked if Owen's Law were to be introduced how confident they would be in the ability of them and their teams to serve allergic individuals consistently safely. This will then allow for comparison of the two scores, to see if they differ and whether confidence will increase or decrease.

4.2.3 Expected Benefits and Problems

An open question will be asked as to what benefits the participants could foresee if Owen's Law were to be introduced.

4.3 Sampling

A Raosoft sample size calculator was used to estimate a recommended sample size. 2023 estimates show that there are 101,000 takeaways and restaurants in the UK (Statista, 2023). Accepting the 95% confidence level, Raosoft suggests a sample size of 383 managers of food businesses.

A mix of convenience and snowball sampling will be used. Convenience sampling will be used at first, using social media, online forums and previous connections to access managers of food businesses. This will allow for larger sample sizes to be created, as no managers of food businesses will be excluded, but it does introduce bias. The individuals identified from previous connections are all likely to be of a similar age, socio economic status and from similar parts of the country as myself which could lead to an overlap in attitudes and opinions, and an overlap in blind spots. The food business managers in my previous connections mostly work for large chains, which means they will likely have had a higher level of allergen related training than any individuals that operate independently owned food businesses, and the costs of training and menu printing are likely to be less of an issue.

Further convenience sampling will be conducted to try and counter this bias. A variety of food businesses in the town centres of Birmingham, Stratford-Upon-Avon, Solihull, Leamington and Warwick will be asked to complete the surveys, with a view to getting more survey completion from smaller companies which will reduce the bias towards larger companies.

4.4 Data analysis

Aim 1 will be answered by looking to find a statistical difference within members of a paired sample, as the same participants provide scores before and after exposure to a hypothetical law change. The data will be ordinal, as the scores will be in categories but with no knowledge of whether the difference intervals on the scale are the same between each other (Manfei et al, 2017). As the data will be ordinal, a Related Samples T Test would not be suitable, so a Wilcoxon Signed Rank Test would be required (Rosner et al, 2006).

In order to answer aim 2, and therefore provide suggestions to answer aim 3, thematic analysis will be conducted to discover recurring themes in responses, and would therefore allow suggestions to be made to change the hypothetical law change to improve compliance

from food businesses (Braun & Clarke, 2006). The study will use reflexive codes and themes that will be generated after the data has been collected and initially read. This will reduce bias, as there will be flexibility to ensure a larger proportion of the data is captured, instead of either missing themes in advance without knowing what the results will show or by forcing responses into codes and themes that may not be suitable. Following familiarisation of the data, the responses will be coded manually in Excel, and the codes will then be organised into themes.

5.0 Expected Benefits of Research

This research will help identify the ease at which managers of food businesses believe that they will be able to adapt to this hypothetical law change. This will be used to help increase buy in from the managers of food businesses, to reduce the feeling of enforcement officers instilling this new law, which may increase buy in from all parties if consultation is carried out. This research will also identify concerns that managers of food businesses have regarding the implementation of this law. This therefore will allow changes to be made as necessary to reduce the resistance to this change, and get the law implemented quicker. The implementation of the law itself has benefits beyond just the safety of allergic individuals. If confidence is increased in this ever growing group of at-risk customers, they are more likely to increase their use of restaurants to a similar level to non allergic individuals with similar backgrounds. This therefore allows the restaurant industry to access a wider range of customers, as not only will the allergic individual themselves eat there more often, they will bring friends and family that may otherwise eat at home instead of restaurants for example for birthday meals. This would therefore increase the profitability potential of restaurants. While the cost of living crisis is slowing their recovery post-pandemic, access to as large a portion of the population as possible is key to help the restaurant industry's recovery.

CHAPTER 3

6.0 Results

Although Raosoft recommended a sample size of 383 to achieve a 5% margin of error, this sample size was not achieved as 89 participants were generated. Following a day being spent in each of Solihull and Stratford-Upon-Avon town centres gathering email addresses for either the managers of food businesses or the site emails to send a link to the survey, only 15 surveys had been completed a week later despite emails being sent to over 200 email addresses. The emails were sent individually to each potential recipient so that no email addresses were exposed to any different people or businesses.

The remaining participants were collected in Birmingham, Warwick and Leamington Spa town centres in an interview style, where the participants were asked the questions and their answers were recorded by myself on the questionnaire form.

With a sample of 89 participants, Raosoft gives a 10.38% margin of error (Raosoft, 2024).

Business Size	Definition of Size	Frequency
Large	Approx. 250 or more employees, >£50m annual turnover	54
Medium	Approx. 50-249 total employees, £10m - £50m annual turnover	3
Small	Approx. 10-49 total employees, £2m - £10m annual turnover	25
Micro	Approx. 0-9 total employees, <£2m annual turnover	7

Table 3 - The definitions of business sizes used, and the frequency of responses from each size

6.1 Wilcoxon Signed Rank Test to show change in confidence in serving allergic individuals

Confidence in serving allergic individuals under the current law was measured using a Likert Scale of the scale shown in Table 4. This question was asked before any mention of the hypothetical change or Owen's Law were introduced to assess baseline confidence.

1	Extremely Confident
2	Somewhat Confident
3	Neutral
4	Somewhat Not Confident
5	Extremely Not Confident

Table 4 - The Likert Scale used to assess confidence in serving allergic individuals safely under the current and hypothetical laws.

The case of Owen Carey was then explained, with a question asking if the participants were aware of the campaign by Carey's family to change the law. The same Likert Scale shown in Figure 2 was then used to assess confidence in serving customers safely if the law were to be introduced.

The mean score for each level of confidence was calculated, with a mean of 1.30 (Range of 1-2, Standard Deviation of 0.46) under the current law, and a mean of 1.93 (Range of 1-5, Standard Deviation of 1.15) following the hypothetical law change.

This therefore means that the food business managers would be less confident of serving customers safely following the hypothetical law change. Whether or not this effect was significant was assessed using the Wilcoxon Signed Rank Test.

Wilcoxon Signed Ranks Test

Ranks

		N	Mean Rank	Sum of Ranks
Hypothetical - Current	Negative Ranks	13[a]	18.50	240.50
	Positive Ranks	41[b]	30.35	1244.50
	Ties	35[c]		
	Total	89		

a. Hypothetical < Current

b. Hypothetical > Current

c. Hypothetical = Current

Table 5 - The Ranks of the Wilcoxon Signed Ranks Test

Test Statistics[a]

	Hypothetical - Current
Z	-4.491[b]
Asymp. Sig. (2-tailed)	<.001

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Table 6 - The Test Statistic of the Wilcoxon Signed Ranks Test

The difference between the two levels of confidence was significant at the 99.999% level (Z = -4.491, p <.001). This therefore shows that there is a significant reduction in confidence of managers of food businesses in their ability to safely serve customers with food allergies were Owen's Law to be introduced.

6.2 Thematic Analysis of expected benefits

6.2.1 Initial Codes

Following analysis of the responses, the following initial codes were identified:

- Safety
- Less risk of reactions
- Transfer of information
- Speed of service
- Level of training

Safety

Any comments making reference to the safety of the customer but without referring specifically to allergic reactions were classed under this code. For example, participant 28 stated "*Customers would be more safe as more information is given without the need for information to be interpreted".*

From 89 responses, there were 48 comments classed under the code "Safety".

Less risk of reactions

Comments specifically referencing a reduced risk of an allergic reaction were classed under this code. For example, participant 50 stated *"Less likely to have a reaction, could see what is safe and what isn't easier".*

From 89 responses, there were 20 comments classed under the code "Less risk of reactions".

Transfer of information

Comments referencing an increase in ease of communication of information were classed under this code. For example, participant 36 stated *"People can easily see what they can and can't order"*.

From 89 responses, there were 23 comments classed under the code “Transfer of information”.

Speed of service

Any comments that were made which referenced an increase at the speed at which the food business could serve people with allergens were classed under the code “Speed of Service”. For example, participant 65 stated *“Quicker to serve and safer”,* which was classed as an occurrence of both this, and “Safety” codes.

From 89 responses, there were 26 comments classed under the code “Speed of Service”.

Level of training

Any comment that made reference to a reduction in the level of training required by the staff in the food businesses was classed under this code. For example, participant 4 stated *“Less staff training needed as long as the information is accurate”*.

From 89 responses, there were 3 comments classed under the code “Level of training”.

Uncoded responses

Of the 89 responses, there were 4 comments that were uncoded. This is due to the comments either stating “*none*” as was found with participants 20, 47 and 48, and participant 33 who stated *“We will get used to it I’m sure, but it seems more complicated”* who did not provide any detail as to what it was about the hypothetical change that would be more complicated.

6.2.2 Themes

These codes were then organised into the following themes:

- Customer Safety
- Business Efficiency
- Accessibility of Information

Customer Safety

Comments coded as “Safety” or “Less risk of reactions” were classed into the theme “Customer Safety”. This is due to both codes referring to the hypothetical change increasing the overall safety of allergic individuals, and reducing the risk at which they are exposed to any danger caused by their allergy.

Therefore from 89 responses, there were 68 comments that were classed into the theme “Customer Safety”.

Business Efficiency

Comments coded as “Speed of Service” and “Levels of Training” were classed into the theme “Business Efficiency”. This is due to the fact that both codes refer to the hypothetical change making it easier for the business to serve allergic individuals quickly and with a reduced level of training needed for their staff. This would therefore reduce costs to the business, increasing their efficiency and profitability.

Therefore from 89 responses, there were 29 comments that were classed into the theme “Business Efficiency”.

Accessibility of Information

Comments coded as “Transfer of Information” were classed into the theme “Accessibility of Information”.

Therefore from 89 responses, there were 23 comments that were classed into the theme “Accessibility of Information”.

6.3 Thematic Analysis of Expected Problems

6.3.1 Initial Codes

Following analysis of the responses, the following initial codes were identified:

- Expense of switching
- Expense of maintaining
- Risk of inaccurate Information
- Reduced communication
- Levels of training
- Cross contamination risks
- Menu clarity

Expense of Switching

Comments that specifically referred to a cost or expense that would be incurred by the business in the process of switching from the current system to the hypothetical new system were coded as “Expense of Switching”. For example, participant 39 stated “*Menu Printing for the whole brand is expensive and takes time”.*

From 89 responses, there were 11 comments coded as “Expense of Switching”.

Expense of Maintaining

Comments that specifically referred to a cost or expense that would be incurred by the business in the maintenance of the hypothetical system were coded as “Expense of Maintaining”. For example, participant 52 stated *“It would be a waste of resources to throw away menus containing out of date information each time something changed”.*

From 89 responses, there were 17 comments coded as “Expense of Maintaining”.

Risk of Inaccurate Information

Comments that referred to the risk of inaccurate information or suggested ways in which information could become inaccurate were coded as “Risk of Inaccurate Information”. For

example, participant 3 stated *“Substitutions could make the menu inaccurate at very short notice”.*

From 89 responses, there were 20 comments coded as “Risk of Inaccurate Information”.

Reduced Communication

Comments that referred to an expected level of reduction of communication either from the business or from the allergic individuals were coded as “Reduced communication”. For example, participant 4 stated *“People would be less likely to tell us that they are allergic”.*

From 89 responses, there were 6 comments coded as “Reduced Communication”.

Levels of Training

Comments that referred to an increase in the level of training that would be required to switch to the new system, or to maintain the new system were coded as “Levels of Training”. For example, participant 72 stated “*Would make training of specs more important, as information would be wrong otherwise”.* This was also coded as “Risk of Inaccurate Information”, as the participant identified a potential route to which information could become inaccurate.

From 89 responses, there were 13 comments coded as “Levels of Training”.

Cross Contamination

Although Cross Contamination is a source of risk to information becoming inaccurate, any comments that specifically referred to cross contamination were coded as “Cross Contamination”. This is due to the number of comments that did refer to cross contamination being almost as large as all other specified sources of risk combined, with clear concern held by the businesses to this potential source of risk. For example, participant 56 stated “*If we don’t know that they are allergic, there might be cross contamination”.*

From 89 responses, 11 were coded as “Cross Contamination”.

Menu Clarity

Any comments that referred to menus or boards becoming complicated, cluttered, or confusing to the business or to the allergic individual were coded as “Menu Clarity”. For example, participant 69 stated “*Too many symbols and numbers on the menu might be confusing”.*

From 89 responses, there were 11 comments coded as “Menu Clarity”.

Uncoded responses

Of the 89 responses, 27 comments were not coded. 25 of the 27 uncoded responses stated *“None”,* with participants 2 stating *“Already do it”,* and participant 47 stating *“I think this is worse than the current system”,* but providing no detail as to any reasons why they think it is worse.

6.3.2 Themes

These codes were then organised into the following themes:

- Cost and Resources
- Threats to Accuracy of Information
- Accessibility of Information

Cost and Resources

Comments coded as “Expense of Switching”, “Expense of Maintaining”, or “Levels of Training” were classed into the theme “Cost and Resources”. This is due to each of the codes making reference to an increase in costs incurred by the business, whether that be in place of buying physical items such as new menus or training staff. This would therefore reduce business efficiency, and reduce the business’ profitability.

Therefore, from 89 responses, there were 41 comments classed in the theme “Cost and Resources”.

Threats to Accuracy of Information

Comments coded as “Risks of Inaccurate Information” and “Cross Contamination” were classed into the theme “Threats to Accuracy of Information”. This is due to the codes containing either general reference to a potential for inaccurate information or specific sources of risks of inaccurate information putting allergic individuals at risk due to wrongly assuming a food item to be safe.

Therefore from 89 responses, there were 31 comments classed in the theme “Threats to Accuracy of Information”.

Accessibility of Information

Comments coded as “Reduced Communication” and “Menu Clarity” were classed into the theme “Accessibility of Information”. This is due to the codes not containing any reference to information being inaccurate, but being inaccessible due to reduced communication, or menu information being inaccessible.

Therefore from 89 responses, there were 17 comments classed in the theme “Accessibility of Information”.

6.4 Familiarity With The Campaign, Owen’s Law

Participants were asked how familiar they were with the case of Owen Carey’s death, and the associated campaign to change food allergy law.

Response	Frequency
Extremely Familiar	3
Somewhat Familiar	5
Neutral	0
Somewhat Unfamiliar	1
Extremely Unfamiliar	80

Table 7 - The frequency of each response when asked how familiar participants were with the Owen’s Law campaign

6.5 Current Process

Participants were asked which of the processes that would be required under Owen's Law are currently in place in their business.

Process	Frequency
The 14 allergens present are listed in writing alongside each menu item without the customer having to ask	2
All servers positively ask each customer if they suffer from any allergies	62
Duty Managers to be obliged to directly supervise the process when allergies are present	8
All servers read out the food order and any dietary requirements with the customer before submitting it to the kitchen	31
None of the above	8

Table 8 - The frequency of each response when asked which processes that would be requirements under Owen's Law are currently in place

6.6 Use of Substituted Products

Participants were asked whether or not they accept substituted products. If they answered yes, they were asked how frequently they check whether or not new allergens are being introduced.

How often are substituted products checked for allergens?	Frequency
Always	63
Most the time	21
Sometimes	2
Rarely	0
Never	0
No substitutions accepted	3

Table 9 - The frequency of each responses when asked how often substituted products are checked the ensure no new allergens are being introduced

CHAPTER 4

7.0 Discussion

7.1 Change in confidence

As shown in Section 6.1, there was a statistically significant reduction in the confidence of food business managers to serve customers with allergy safely following a hypothetical introduction of Owen's Law. This answers aim 1 outlined in section 3.0, as it analyses managers of food business' attitudes towards a hypothetical introduction of Owen's Law.

As outlined in section 2.5, the reasoning behind the introduction of Owen's Law is to increase the safety of food allergic individuals when eating in food businesses as those businesses are a high risk environment for allergic individuals to eat. However, this decrease in confidence from food business managers could have an overall detrimental effect as it would both weaken the improvements made by the law change, and exacerbate problems with the current law.

If the manager of a food business loses confidence in the ability of them and their teams to consistently serve allergic individuals safely, there is an increased chance that they will take extra steps to ensure that no reactions happen in their business, so as to cover themselves legally and to ensure that they do not go through the experience of having a fatal reaction in their business. Steps such as placing warnings on menus that no guarantee can be made of the absence of any allergens in any food items due to a cross contamination risk, or outright refusing the serve any customers with allergies will have the opposite effect of what the law change is attempting to achieve, and will exacerbate problems with the current system.

These steps would likely lead to food allergic individuals eating in food businesses less often. If allergic individuals are either told that they will not be served, or feel that it would not be safe for them to eat, this will obviously reduce the amount of money spent by allergic individuals and their families in food businesses. However, it could also reduce the level of communication from allergic individuals. Eating in food businesses is a key social event, whether that be celebratory meals out for birthdays and events, or takeaways in a new university flat or house. Missing out on these events, or worrying that you may be excluded from these events would have a severe impact on the allergic individuals social wellbeing. This could therefore increase the rate at which allergic individuals decline to disclose their allergy. If the businesses are not informed, they will not know to carry out any allergy

process that they have in place to reduce the likelihood of cross contamination to cause the information listed on the menu to become inaccurate, therefore further putting the allergic individuals at risk.

However, there are several reasons that this statistically significant decrease in confidence could be otherwise explained that threaten the validity of this data. Were the confidence under the current law to be estimated or reported higher than the actual level, or the confidence under the new law to be estimated or reported lower than the actual level, this would exaggerate the effect, and could therefore affect the statistical significance of the data.

In first contact with potential participants, I introduced myself as a student studying Environmental Health. If any asked, I explained that it was an MSc course at the University of Birmingham, but many did not. It is reasonable to assume that some of the food business managers might have therefore assumed that I already worked for their area's local authority, or would be soon in the future. It is therefore highly unlikely that they would self report a low confidence even if they did have one. The managers would not speak of their business in a self-incriminating way, both because of pride and because of a fear of closer attention from individuals in an enforcement role in the future. Incidents of allergic individuals experiencing a reaction are also relatively rare, with very few managers having experienced an incident in their businesses. With this low level of exposure, it is therefore possible that managers overestimate how safely they serve customers due to never witnessing it go wrong themselves.

It is also likely that the participants underestimate and under-report their confidence of serving allergic individuals were Owen's Law to be introduced. Current law that underpins serving allergic individuals was introduced in 2014. Therefore, staff working in food businesses have either spent their entire career working under the current law, or have 10 years of experience doing so. As outlined in section 2.3, staff in the food industry tend to be younger with higher levels of turnover than other industry's workforces. Therefore the vast majority of staff in the food industry have only ever worked with the current system, with slight tweaks in company policy as policies change or people change jobs. Fear of change is a well documented psychological phenomenon, with individuals facing uncertainty due to comfort with the current system that they are used to, fear of the uncertainty and the lack of control with the unknown new system, and preference to avoid risks in changing systems all being normal reaction when approached with a change in system or routine (Weeks et al, 2004). This is supported by the fact that there were 25 participants who could not state a problem they anticipated of Owen's Law, compared to the 3 that stated that they could not

state a benefit. Despite a larger number of participants not being able to identify a problem, overall confidence was significantly reduced suggesting the effect could be largely explained by fear of change. The vast majority of food business managers are also reporting their confidence at the first exposure to this system, as shown in Table 7, with 89.89% of participants reporting that they are either Mostly or Extremely Unfamiliar with the campaign of Owen's Law. It is therefore potentially not a valid comparison, as the comparison is between a system with which participants have up to 10 years of experience working under, and a system that 89.89% of participants were unfamiliar with. With time to understand the new system, training, and experience working under the new system, it is likely that this confidence would increase quickly.

7.2 Expected Benefits

Participants answered an open question, outlining the benefits that they foresaw if Owen's Law were to be introduced. Codes were identified, and were categorised into themes. From 89 responses, 68 comments were categorised as "Customer Safety", 29 comments were categorised as "Business Efficiency", and 23 comments were categorised as "Accessibility of Information". These results in conjunction with the results outlined in Section 7.3 contribute toward answering aim 2, as they outline recurring themes in the expected benefits and problems outlined by managers of food businesses.

7.2.1 Customer Safety

The campaign of Owen's Law was started following the death of Owen Carey, with a view to reducing the number of avoidable deaths due to allergic reactions in the future. From an allergic individual's point of view, having more information about what allergies are present in food will increase the level of safety you experience when ordering food as the potential for human error to put you in danger is reduced. This is a view that is also shared with the majority of participants. Two codes were categorised as "Customer Safety", comments coded as referring to a general increase in safety and comments coded as referring to a specific reduction in likelihood of allergic individuals experiencing an allergic reaction.

These results show that participants agree that were Owen's Law to be introduced, there would be an increase in the safety of allergic individuals eating in their businesses. This increases the potential future profitability of businesses. If an increase in safety for allergic individuals is realised, this would increase the frequency of which allergic individuals would eat food purchased from food businesses. As outlined in Section 2.3, food allergic

individuals eat food from businesses less frequently than non-allergic individuals. If the level of safety were to increase, this would also increase, allowing businesses access to a larger portion of the population to increase their sales.

7.2.2 Business Efficiency

One recurring theme that was not predicted or outlined in the campaign of Owen's Law, but was outlined by 32.58% of participants is an improvement to business efficiency. Comments discussing an increase in speed of service of allergic individuals or a reduction in the level of training required for staff were categorised as "Business Efficiency". This is due to these comments discussing benefits that would reduce costs to the businesses.

Under the current laws, it is required that businesses are able to account for the presence or absence of the main 14 allergens. As it is not required that this is presented on the menu, it is often in a matrix that the staff have access to. As a result, allergic individuals are most often faced with a menu that does not contain information of what is and isn't safe for them to eat. The process of allergic individuals having to decide what they would like to order, check with the member of staff whether or not this is safe, and have to choose something else if it is not safe is a time consuming process. In a fast paced environment such as hospitality, business efficiency is reduced if servers are having to spend significantly longer to ensure allergic individuals are ordering something that is safe to eat, which could increase the likelihood of a server mistake if they are rushing or a allergic individual mistake of not telling the server if they don't want to keep them busy. If the allergens were proactively written, the process of ordering would be quicker as the allergic individuals would easily be able to see what items were and were not suitable, and would just need to inform the server so the kitchen staff were aware to carry out their allergy process in the kitchen. Spending less time ordering with each allergic individual would allow for servers to work more efficiently, as their time would not be delayed spending significantly longer with a customer with allergies. This could therefore make businesses more profitable, as it may reduce the number of servers that are required for any session which would reduce staffing costs.

Training for staff is another significant expense for businesses. As outlined in Section 2.3, allergy training is often refreshed, which costs money for businesses to run. It was outlined by 3 participants that were Owen's Law to be introduced, the level of training required for staff could be reduced. If the information on the menu listing the allergens is accurate, the servers could have a simpler process to safely serve allergic individuals, therefore would require less training. The current system often requires servers to read allergy matrices

accurately when a allergic individual wants to order a certain dish with a certain allergy to determine whether or not the dish is safe for the allergic individual. This is a point of potential failure in the current system. As also outlined in Section 2.3, while allergy training is often refreshed, there are many reasons that it is ineffective. A lack of understanding from the server, lack of communication from the allergic individual, and language barriers are all potential causes of a failure at this point of the current system which would all be removed by the introduction of Owen's Law. Therefore as under Owen's Law the process required from a server when serving a customer with allergies would be simpler, the level of training required would be reduced. This would therefore increase profitability of businesses, as it would reduce the business cost of training required.

7.2.3 Accessibility of Information

Another recurring theme outlined by participants was "Accessibility of Information". Comments that discussed allergic individuals having greater and easier access to information about which dishes contain which allergens were categorised as this theme, as they referred specifically to benefits realised by both the allergic individuals and the businesses of allergic individuals having greater access to this information.

As outlined in Section 2.1.1, the cause of allergies are unknown, and there is no known preventative treatment or cure, and multiple problems with the only known reactive treatment if a reaction occurs. Therefore the transfer of accurate information is key in keeping allergic individuals safe, as the only way to do so is for allergic individuals to not eat the food that they are allergic to. Therefore any changes that increase the accessibility of this information will increase the safety of allergic individuals. This change would also put this key information in the hands of the allergic individual, reducing the likelihood of any mis-communication causing the server to not know or understand what the allergic individual is allergic to.

7.3 Expected Problems

Participants answered an open question, outlining the problems that they foresaw if Owen's Law were to be introduced. Codes were identified, and were categorised into themes. From 89 responses, 41 comments were categorised as "Costs and Resources", 31 comments were categorised as "Threats to accuracy of information", and 17 comments were categorised as "Accessibility of Information". These results in conjunction with the results outlined in Section 7.2 contribute toward answering aim 2, as they outline recurring themes

in the expected benefits and problems outlined by managers of food businesses. These results also allow for aim 3 to be addressed, as the problems foreseen by businesses can be addressed by making tweaks to the suggested law change to increase the confidence businesses would have serving allergic individuals safely, without reducing the safety for allergic individuals.

7.3.1 Costs and Resources

A recurring theme outlined by participants was an increase to business costs, or use of more resources. Comments referencing the costs of switching to this system, maintaining this system, or increased levels of training were all categorised as “Costs and Resources”, as they all refer to a cost that would be incurred by the business as a result of Owen’s Law being implemented. These problems would therefore offer a contrasting point to the benefits raised in Section 7.2.2 which discuss benefits that would increase business profitability, whereas these problems identified would threaten business profitability.

Participants reported that menu prints are expensive and take time. In initially switching to working under Owen’s Law, there would therefore need to be a significant amount of time afforded to businesses to allow this to happen. However this problem is not unique to a change in law, with many businesses changing their menus regularly and therefore needing to carry out full reprints and discarding old menus regularly anyway. A potential expense that would be incurred by businesses that would be exclusive to working under Owen’s Law that was raised would be the need to carry out full menu reprints if any ingredient becomes unavailable or needs changing and the replacement product contains different allergens. Under the current system, if for example a burger contained mayonnaise, it would list mayonnaise in the description of the product. The businesses would then be required to know whether or not this product contained mustard, as mustard is one of the 14 main allergens outlined in Annex II of EC 1169/2011. Hellman’s are a large producer of mayonnaise, and produce versions that both do and do not contain mayonnaise (Unilever 2024, Tesco, 2024). It is therefore possible that a business usually purchases mayo that does not contain mustard but suddenly that version is no longer available with their supplier, and the supplier only stocks mayonnaise that does contain mustard. Under the current system, the business would update their system whether it be online or printed, and if printed would only need to print a small number of copies. The description of the product on the menu could stay the same, as long as the business was able to account for the presence of mustard, and would not need to carry out a full menu reprint. However if this were to occur under Owen’s Law, all previous menus that contain the burger stating that it does not contain

mayo would need to be discarded and replaced. This would therefore take time and cost money, and provides a new potential point of failure if any old versions of the menu are left in circulation.

Participants also raised potential issues regarding an increase in the level of training required. This is in direct opposition to the benefits raised in Section 7.2.2, where participants spoke of a reduction in the level of training required. It is clear that were Owen's Law to be introduced, there would be an immediate need for a significant level of training across the industry. The new system would require a complete overhaul of the current system. This would therefore require training of the trainers, and training of the workforce. Again, provided that plenty of time is given between confirmation of the law change, this initial increase in training load will be feasible for businesses to achieve. And then in theory, as outlined in Section 7.2.2 and shown in the study in the Republic of Ireland outlined in Section 2.5, there should be a reduced training load in maintaining the system.

7.3.2 Threats to Accuracy of Information

One significant recurring theme outlined by participants was "Threats to Accuracy of Information". These comments were sometimes vague, suggesting that if information is inaccurate it could put the whole system at risk, but many focussed on specifically cross contamination and substituted products as threats to the accuracy of information. As outlined in Section 7.2.3, the importance of transfer of accurate information is paramount to the safety of allergic individuals, and if information's accuracy is threatened this could lead to a reduction of safety as allergic individuals and servers may incorrectly assume an item is safe.

One weakness of Owen's Law is that cross contamination can occur in kitchens which could put allergic individuals at risk. If the menu states that a dish does not contain an allergen, allergic individuals will obviously assume that they are safe to order. However, if the same equipment is used to prepare that meal that has previously prepared meals that do contain the allergen, the product could become contaminated with the allergen. However, this is also a problem under the current law too. Although still a problem, this is not a new problem caused by the introduction of Owen's Law. The other steps outlined by Owen's Law will also provide extra cover to ensure that the risk of cross contamination is reduced. If servers positively ask all customers if they have allergies, and allergic individuals tell the servers, this will allow for the servers to inform kitchen staff. At this stage, businesses will already have a process that ensures safe allergen management as part of their HACCP, and this will include

steps such as using new or cleaned equipment, and not using any open products in fridges or saladettes. Were Owen's Law to be introduced with its additional processes such as servers positively asking customers whether or not they have allergies as a legal requirement, this would therefore reduce the risk that cross contamination poses to the accuracy of information, and therefore reduces the risk to the safety of food allergic individuals.

Substituted products are used in food businesses whenever the product that is usually used is unavailable. As outlined in Section 7.3.1, similar varieties of the same product can contain different allergens such as two Hellman's Mayonnaise, one of which contains mustard while the other doesn't. Were a substituted product to be delivered or purchased, it is essential that the business knows whether or not this substituted product contains any new allergens. As shown in Table 9, of the 87 businesses that accept product substitutions, only 63 of them reported that they "Always" check the products for any new allergens. This therefore shows that there is potential for substituted products to be accepted in 25 of the participant's businesses which do introduce new allergens with no knowledge of them. This would therefore provide a point of failure, where the accuracy of the allergens listed on the menu could be compromised putting the safety of the allergic individuals at risk. As with cross contamination, this is also a weakness of the current system. Allergy guides and matrices would need to be updated whenever substitute products are accepted with new allergens being introduced, and if those new allergens are not being checked the business will not know to do this. However unlike with cross contamination, there are no supplementary steps that would help reduce this risk and eliminate this point of failure. Section 7.5 will outline a suggested change to the supplementary steps of Owen's Law that should improve the safety of allergic individuals.

7.3.3 Accessibility of Information

A theme that arose in both the problems and the benefits is accessibility of information. While Section 7.2.3 outlines the benefit that information is more readily available for allergic individuals, the participants outlined that a reduction of communication from the allergic individual to the server, and an increased risk of misunderstanding information on the allergic individual's part could put allergic individuals at risk.

One recurring issue outlined by participants was that allergic individuals may tell servers of their allergies less frequently as they assume something is safe if their allergen is not listed on the menu. This therefore would not allow businesses to carry out their allergy process to

reduce the risk from cross contamination. While this is an issue under the current law, it is less likely that allergic individuals will not declare their allergy as they receive very little information about what allergens are present in each dish without doing so. This problem could be alleviated by building on a previous Food Standards Agency campaign and is outlined in Section 7.5.

Participants also raised the issue that menus containing many dishes with many allergens in, and therefore many numbers and symbols to indicate allergens may look confusing or cluttered. Figure 2 shows an example of a menu taken from a food business in Dublin, where an equivalent of Owen's Law is already in place. The numbers used in this menu are very clear, and there is a clear key. Businesses may want to make menus more subtle than this example, and any formal legislation stating how clear this must be will always be subjective as there is no way to word it, other than by saying that the information and associated key must be clear. This is a potential weakness of this law change, as if a menu contains more subtle information so as to fit in with the aesthetic of a menu or business, this information may be harder to see and could be missed, therefore putting allergic individuals at risk of eating something that they are allergic to.

Figure 2 - An example of a menu from a food business in the Republic of Ireland, where a law similar to Owen's Law is already in place

7.4 Feasibility of Introduction

As shown in Table 8, all but 8 businesses currently do at least one step that would become law were it to be introduced. However, not one business reported that they already do all of the steps, with "All servers positively ask each customer if they allergic individual from any allergies" and "All servers read out the food order and any dietary requirements with the customer before submitting it to the kitchen" being the two most common current steps with 62 and 31 participants respectively. However, the fact that each step is currently in place in

at least one business shows that all of the steps individually are achievable. It also shows that it is not a significant hindrance to the business to achieve, as they have chosen to instil these processes while they are not a current legal requirement. This fact, along with the evidence that businesses in the Republic of Ireland report that compliance with this law is not difficult outlined in Section 2.5, shows that it is therefore realistic and feasible to expect that businesses in the UK would be able to introduce the steps outlined in Owen's Law and maintain them.

7.5 Suggestions For Improvement

It is important that any changes suggested to improve Owen's Law increase allergic individuals safety but without increasing a practical or financial burden on businesses, or reduce the practical or financial burden on businesses but without compromising the increased safety of allergic individuals.

While the benefits of having the allergens listed in writing without the customer having to ask are clear, problems have been outlined by participants of having them printed on the menu. Therefore if they were printed on a separate allergy matrix that clearly stated which dishes contain which allergens that could be updated daily, this would maintain the benefits of reducing the number of transfers of information and therefore reducing the number of points of failure, but would also reduce the need to repairing an entire inventory of menus each time something changes. Businesses that leave menus in a menu stack on each table could ensure that a matrix is in each stack, businesses that hand menus to guests as they sit could ensure that they hand a matrix to each table, and businesses that use a static menu behind the counter could hand a copy of a matrix to each guest if they did not want to put symbols or numbers on the static menu behind the counter. In order to counter the problem of menus being confusing or being significantly different in each business, these matrices could have a standard formatting. This would ensure that each business was working in the same way, and it would increase familiarity with the system for both food businesses and allergic individuals.

Another potential point of failure in both the current and hypothetical systems that is not addressed by any supplementary steps is the potential introduction of substitute products which introduce new unknown allergens. Therefore, a legal confirmation of business responsibility to always check for the presence of new allergens when using substituted products would help reduce this problem. It is not unreasonable to expect a business to

know exactly what is included in their products, therefore enforcing this as a legal requirement is reasonable and feasible for businesses to comply with.

In order to reduce the likelihood of allergic individuals declining to disclose their allergy, and therefore exposing themselves to an increased risk of cross contamination, a campaign should be run to expand on the work completed by the Food Standards Agency (FSA) in their campaigns to raise awareness of the importance of allergic individuals informing food businesses of their allergy. In 2018, the FSA ran the “Easy to Ask” campaign, which was aimed at young allergic individuals aged 16-24 (FSA, 2020). This campaign aimed to raise young people’s awareness of their rights to allergen information in food businesses, give young people the confidence to ask for this information and decrease the stigma associated with young people declaring their allergens. This was then followed by the “Speak up for Allergens” campaign in 2022 (FSA, 2022). This focussed on young adults moving away from their parents for the first time, whether that be moving into university accommodation or their first homes. When growing up with a food allergy, parents will take the responsibility for ensuring allergic individuals are safe. This campaign specifically focussed on ensuring allergic individuals always tell businesses, even if it is a dish they have ordered that meal from that business before. Evaluation of these campaigns has either not been completed, or the FSA has not published these evaluations. As a result, it is unknown if these campaigns have been successful in increasing the rate at which allergic individuals declare their allergies. Evaluation of these campaigns would allow for future campaigns to be more cost effective, to have a greater impact with a smaller cost.

8.0 Conclusions

It is clear that there are weaknesses in the way that customers with allergies are served in food businesses in the UK. The similarities between the deaths of Shahida Shahid and Owen Carey show that these weaknesses have not been reacted to, and the fact that food allergy law remains the same is putting more customers with allergies at risk in the future. As has been seen very recently with the case of Hannah Jacobs’ fatal reaction to milk in a Costa in London (BBC, 2024), the current set of legislation allows multiple points of failure where mistakes from either the businesses, servers or the customers puts the lives of customers at risk.

The family of Owen Carey propose a change to the law where amongst other changes, the presence of any of the 14 main allergens outlined in Annex II of EC 1169/2011 must be declared in writing without the customer having to ask for that information. There are obvious benefits for customers with allergies. With greater information access, there is no need to

suffer the social issues of having to ask servers which meals are and aren't safe for you, no chance of you forgetting to mention, and no opportunity for a breakdown in communication between the customer with an allergy and the server to put the customer in danger.
A sample of managers of food businesses outlined benefits to this hypothetical change also. The majority of participants also indicated they believed that customers with allergies would be safer under this system, as well as benefits to the business such as increased speed of service and reduced training needs.
The participants also identified problems that they expected to experience were this hypothetical change to be introduced. Problems such as an increase in business costs due to an expected increase in the number of menus that would need to be discarded as information became out of date, an increase in staff training levels, a reduced level of communication expected from customers with allergies and multiple threats to the accuracy of information were identified.
However some tweaks could be made to the suggested change in law made by Carey's family, so as to reduce the impact of these negatives without compromising the safety of customers with allergies. In order to reduce the waste of resources in discarding menus with out of date information on, and to reduce the cost and time of full menu reprints, allergy matrices could be printed and made available to customers without asking. These matrices could have standard formatting, so as to reduce confusion and increase the familiarity with the system that customers with allergies and food businesses experience. The threats to accuracy of information could be countered too. If a legal requirement were introduced that businesses must ensure that any substitute products used are checked for the presence of new allergens, it would allow the business to update the matrix with accurate information.
Cross contamination is also a risk. The FSA has previously ran campaigns aiming to increase the rate at which customers with allergies inform food businesses of their allergy, however these campaigns have not been publicly evaluated. Evaluation of these campaigns would allow for future campaigns to be run more efficiently, to further increase the rate at which customers with allergies would make businesses aware of their allergy, which would allow for the businesses HACCP system of allergen management to minimise the risk of cross contamination to an acceptable level.

8.1 Further research suggestions

As outlined in Section 7.1, it is likely that participants underestimate or under-report their confidence at serving allergic individuals safely if Owen's Law were to be introduced. It is therefore vital that if Owen's Law is introduced, that follow up research is conducted. This will allow time for participants to receive training, and gain experience and understanding of

the new system and their role within it. Therefore it is likely that confidence of working under Owen's Law would increase, reducing the effect size of the decrease or removing it altogether.

As outlined in Section 7.5, it is unknown how successful previous FSA campaigns have been in increasing the rate at which allergen allergic individuals declare their allergy when ordering from food businesses. An evaluation of these campaigns would allow for further campaigns to be improved, to further increase the rate at which allergic individuals declare their allergies which would therefore help reduce the weakness of Owen's Law that a reduction of communication is expected by food business managers.

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