Evaluating the Food Allergen Management in 5 Star Hotels in Malta

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Abstract

Since the 1950s, the incidence of allergies in developed countries has seen a steady rise. This is particularly noticeable where food allergies are concerned. According to the European Academy of Allergy, food allergies affect more than 17 million people across Europe, including Malta. This study will provide information on how 5-star hotels in Malta and Gozo manage safe food handling related to food allergies.

This study is based on quantitative analysis collected from staff working in local 5-star hotels. Several aspects are discussed and compared to foreign studies on the subject, including EU legislation, communication, training, safety procedures and emergencies.

Following the discussion, a set of recommendations are put forward to address certain challenges and difficulties that food industries are experiencing.

Dedication

To my beloved wife Joanna

and

my adorable daughter Leah

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Chapter 1. Introduction

1.1 Introduction to the Study

Food consumption is one of the main delights of human existence, besides being essential for survival. However, different bacteria, viruses and chemical hazards can be transmitted to humans through contaminated food, which may result in illness and even death. Such hazards may occur through several types of exposure, from primary production in the food chain to domestic handling and food consumption (WHO, 2017). Whether eating for pleasure or for the sake of survival, consumption of contaminated food can be hazardous for consumers' health.

Around 17 million Europeans suffer from food allergies, of which 3.5 million are under 25 years of age (MRS, 2018). In 2014, up to 6% of the Europeans self-reported at least one common food allergy (Nwaru, et al., 2014). The growth of such allergies is generally increased in industrialised regions, especially in developing and rapid economic growing countries (Leung, 2017). Scientists believe that the number of people with food allergies is rising, as is the number of foods to which they are allergic (Hadley, 2006). In view of the dramatic rise of food allergies globally, (Heine, 2018), a preventative and educative food handlers' training strategy has become of the utmost importance, in order for staff to be well informed and trained to prevent food allergies. Correctly managing a request from a food allergy sufferer is imperative and the staff of any food-handling businesses must be adequately and continuously trained to handle such demands (Heine, 2018).

The number of severe, potentially life-threatening allergic reactions known as anaphylaxis occurring in children is also increasing (European Academy of Allergy, 2018). This translates to 2.29% of Europe's population. Moreover, when this statistic is applied to the Maltese population, it results that 10,085 persons could potentially be suffering from one form or another of food allergy. With the influx of tourists, the population could potentially go up to around 20,000 during the summer season (European Academy of Allergy, 2018).

Being highly dependent on tourism, Malta's economy is also impacted by food allergies. The matter is also increasingly being recognised as a public health burden (Wenyin, 2018). This is because it impacts not only the individual's quality of life, but

also comes at a cost to society (Harari, Toren, Tal, & Ben-Porat, 2021), including the food industry and the public health sector in Malta. Restaurants and any food production business success and profit-making depends on patrons making use of their service. Though a small country of 493,559 (NSO, 2019), Malta has the third highest household expenditure on eating out in the EU, 12.6% in 2018 (Eurostat, 2020). Its population almost doubles in the summer season, with the peak influx of tourists between July and September (Malta Tourist Arrivals, 2019).

Anaphylaxis involves hypotension, hives, swelling of the face and throat and in some instances shock, is severe and can potentially cause death (Anaphylaxis, 2022). According to Umasunthar et al (2013), the rate of death from fatal anaphylaxis attacks related to food allergy is 1.81 per million per year. Studies on this aspect are few; also, the cause of this increase is not yet clear. For such rise, Strachan (2018) came up with 'the Hygiene Hypothesis' amongst others. This hypothesis was presented in the British Medical Journal in 1980, suggesting that we had now been 'too clean' in our living conditions (Cahill, 2018). This theory was replaced by the 'old friends' theory, developed by Rook, which emphasises the ancient microbes present during human evolution instead of childhood infections (Smith Y. , 2019).However, this is unlikely to be the only reason for this increase.

1.2 Objectives of this study

Catering for food-allergic customers has become a must. Several years of experience in high-end restaurants and hotels led me to approach this research. From my experience working in 5-star hotels both locally and abroad, it is clear that allergy requests have increased over the years. I have noticed that during the last 10 years customers have displayed an increased awareness, pointing to an increase in requests related to food allergies.

This study shall delve deeper into the general principles of food allergen management. In order to understand better the situation in Malta and Gozo, for this study, staff in 5 stars hotels have been anonymously and randomly chosen to answer questions in order to evaluate their knowledge on food allergies, with an insight into allergen education and safety, training and communication.

The aim of this research is to evaluate the preparedness and knowledge of the employee who is directly in touch with food allergy clients. It will highlight the existing gap between the application of the existing local and EU laws and the application of such laws in the food industry.

Living with a food allergy is neither comfortable nor easy. It has a huge impact on the quality of the individual's life. This research study will also evaluate and tackle the issue of how food production personnel are equipped and trained to guarantee a safe dining experience for persons suffering from food allergies. It will investigate the business's perspective regarding the training and education of their staff as well as the legislative aspect of the responsibilities they carry in serving food. It also proposes an action plan in terms of how to manage and educate the concerned parties in food establishments to reduce incidents involving food allergies.

This study will focus on how the 5-star hotels around the Maltese islands are handling food allergies. The purpose of this study is to examine the knowledge related to allergies of the staff working in 5-star hotels in Malta and Gozo. Attitudes, norms and behaviours are analysed through the questionnaire answers on the basis of knowledge and handling allergies. This research shall evaluate the food allergen procedures that are maintained within the operation, how a food allergen-friendly environment is maintained and the handling of food production during standard working operational hours. Through these questionnaires, the research shall evaluate to what extent local food professionals working in 5-stars hotels operate in relation to food allergens.

The following chapters will discuss in detail how this study is being held and reviewed, compared to others. Finally, it will present the results concluded through this study together with the relevant recommendations.

1.3 Research Methods, Material and Structure

Following this introduction, the next chapters are to take the following structure:

In Chapter 2, the Literature Review will provide an in-depth exploration of previously submitted studies, published articles, journals and books related to allergens and their management in a food business operation, hence demonstrating knowledge and understanding of this subject. The distinction between food allergy and food

intolerance, which are commonly confused, will also be explained (Gargano, et al., 2021).

The Research Methodology in Chapter 3 discusses how quantitative methods have been adopted for this study to collect the data, giving a general overview of the sample population, size and method for data analysis. This research is mainly based on survey questionnaires distributed to staff working in 5-star hotels in Malta and Gozo. Data gathered through the questionnaires is analysed using inductive reasoning without assumptions.

Chapter 4: Research Analysis and Discussion

This section delves into the responses and results from the research carried out, including the questionnaires. Analysis of findings is done throughout this chapter and supported with secondary data.

Chapter 5: Conclusion and Recommendations

This study is concluded by pinpointing the results of the research carried out. Moreover, opinions and recommendations are presented to conclude this research.

Chapter 2. Literature Review

Training about food allergens is an important food safety measure as part of effective allergen management control (Schembri, 2017). Schembri witnessed resistance to training in staff within the Maltese food production businesses and stressed the need for a general behavioural change to emphasise the importance of this subject. Furthermore, in his working groups with food allergy sufferers, he experienced limited or low trust in the food production industry as regards safe, allergen-free food being served. Schembri (2017, as cited in Carabott 2017), urges that the EU regulations demanding that ingredients should be clearly listed and should be included on restaurant and take-away menus need to be observed (Carabott, 2017).

In their study, Tarro et al (2017) concluded that customers' satisfaction is closely related to the availability of allergy-free food and knowledgeable staff. Similarly, Begen et al (2016) found that customer satisfaction of restaurant customers with food allergies increased when the staff were trained to give knowledgeable information about food allergies, both verbally and in writing (Begen, et al., 2016).

2.1 Food Allergy

Food allergies are the abnormal reaction of the body's immune system triggered by a specific protein in foods. The immune system functions as the human body's defence mechanism against invasive organisms and proteins that lead to reaction. The defensive mechanism consists of tissues, cells and organs such as spleen and bone marrow which produce and supply white blood cells know as Leukocytes. These Leukocytes are kept in the human body in tissues known as lymphoid. The leukocytes are circulated through the body passing through the blood vessels and the blood system, to attack and kill any unwanted external items (Waserman & Watson, 2011).

The immune system in the human body is intended to recognise foreign protein antigens, such as a proteins and infectious organisms and in return emit antibodies to attack foreign objects and hence prevent infections. When a human body is allergic to a particular food item, the immune system abnormally reacts back as if the protein found in the food is a threat to the body. The body's immune system responds to this

food protein by releasing another type of protein known as Immunoglobulin (IgE) to attack the ‘invasive’ protein. A reaction can occur also when the protein is found in trace amounts. Harmful symptoms to the human body can occur because of this, better known as ‘over-reaction’. This can also lead to a serious reactions known as anaphylaxis. Anaphylaxis is a severe and in cases deadly allergic reaction, with symptoms against others include of tightening of the airways, loss of consciousness, pulse increase, drop in blood pressure and swollen throat. Untreated anaphylaxis may induce coma and result to death (Cahill, 2018).

There is no cure for food allergy (Newswire, 2006). The only way to avoid food allergy reactions is to strictly avoid the specific food or ingredient. Over-the-counter antihistamines mitigate the symptoms of a mild reaction and only an injection of epinephrine can reverse anaphylaxis (Food Allergy, 2019).

2.2 Food Intolerance or Food Allergy?

There is a major difference between food intolerance and food allergy (Li, 2019). Li (2019) stated that the immune system is not involved when a reaction is triggered by food intolerance, however the digestive system is. Food intolerance is the lack of enzyme needed to digest and breakdown a particular food. A human body may also be intolerant to natural chemicals found in food items and can display sensitivity to food substances. For instance, lactase is an enzyme responsible for breaking down lactose. Lactose intolerance in the digestive system will results in symptoms such as gas, stomach pains and bloating. According to Li (2019), when a person is intolerant to a food item, a small amount of such item can be consumed without resulting in any symptoms, however this is highly dependent on the intolerance to a particular food. Furthermore, medicines in the form of pills and drops are available and can be consumed before a meal. These medications work by replacing the enzyme deficiency, thereby allowing the person to eat consume any food without symptoms or side effects. On the contrary, an allergic reaction can manifest itself as a severe reaction to the allergen inhaled or consumed, with severe and occasionally fatal results (Justiz Vaillant, Vashisht, & Zito, 2021). Allergy is, today, defined as an immunologically mediated and allergen-specific hypersensitivity (Akdis & Agache, 2014).

2.3 History of Allergies

Allergic diseases are not new. In fact, allergies go back several epochs in history, as indicated in various early medical literature in different cultures around the world, including Egypt, China, indigenous America and Greco-Roman tradition (Bergmann & Ring, 2014). Although allergies were described in ancient manuscripts, the term allergy was coined in 1906 by Clemens von Pirquet as 'specifically altered reactivity of the organism'.

As a consequence of the rise in food allergies, research and studies are always ongoing worldwide.

2.4 Factors related to allergies

Age

Age, knowledge, self-awareness and the severity of allergy reactions all affect the risk behaviour of allergy patients. Age is one of the major factors that bears an impact on allergy patients. It is noticeable that the number of children under 3 years of age allergic to one or more ingredients is higher than in adults and often occurs directly (Radlović, et al., 2016). In the USA, it is estimated that 8% of the child population suffer from food allergies, translating to 1 in 13 children (Gupta, et al., 2018). In the UK it is estimated that the corresponding percentage of toddler sufferers is 5%-8%, the percentage resulting as greater than that in adults (1%-2%) (Prescott, et al., 2013).

Genetics

Ethnic difference is another factor that affects allergic patients. In fact, when comparing European food allergic patients, it should be noted that Mediterranean countries show a reaction to profilin, which has been recognised as the allergenic protein in pollen and latex. The protein family for plant food allergies is mostly common in Mediterranean countries, including Malta (Akdis & Agache, 2014). Food allergies related to pollen are the most common for food hypersensitivity (Salcedo, 2004). These proteins are found in native, cooked or processed foods which cause allergic

reactions to plant-derived foods, including vegetables, fruits, grains, seeds, nuts and legumes. No animal source foods or artificial ingredients are included (Salcedo, 2004).

2.5 Incidence of Food Allergies

In recent decades, allergies have increased both in terms of their volume and the number of sufferers. According to the European Academy of Allergy and Clinical Immunology (EAACI), in 2015 more than 150 million Europeans suffer from one or more type of allergy in general, out of which 7 million Europeans live with a food allergy. It is predicted that by the year 2025 more than 50% of the European population will be affected by at least one type of allergy (EAACI, 2015).

The incurrence of food allergies in children has “skyrocketed” over the last few years (Knight, 2006). In 2013, Cezmi Akdiz, the EAACI declared the “Current European statistics are worrying, especially given that there has been a seven-fold increase in hospital admissions for anaphylaxis in the past 10 years”. To this declaration the EAACI acknowledge the fact that only through education and prevention can lead to effective management of food allergies (European Academy of Allergy and Clinical Immunology, 2013).

Also in 2013, the Centres for Disease Control & Prevention stated that between 1997 and 2011 food allergies in children expanded by 50% (Jackson KD, 2013). Moreover, it continued describing that between 1997 and 2008 the frequency of peanut and nut allergy tripled (Keet, et al., 2014). In this respect, between 2006 and 2016, the US insurance saw an increase in claims linked to food allergies by 377% (Wu, 2017).

Tang (2017) stated that in western countries, such food allergies and anaphylaxis are seemingly a public burden. What causes this is still unknown (Tang, 2017). Congruently, Santos (2019) said “the frequency of food allergy has increased over the past 30 years, particularly in industrialized societies. Exactly how great the increase is, it depends on the food and where the patient lives. For example, there was a five-fold increase in peanut allergies in the UK between 1995 and 2016”.

On the global spike of food allergies there is still lack of official statistics and information. Some countries, in particular Central and South America, Eastern Europe, Africa and the Middle East lack any prevalence data related to food allergies (Prescott, et al., 2013).

2.6 Overview of Food allergies – Type, Causes and Symptoms

According to a report published by the University of Manchester, there are more than 80 different foods that have been reported as causing food allergies [Appendix 2] (Manchester Academic Health Science Center, n.d.). Around 7 million Europeans reported reactions to food, of which 3.5 million were under the age of 25 (EFA, 2019). However, medical treatments show discrepancies between those who were truly diagnosed with a food allergy and reports of food allergy symptoms by care seekers, with incomplete reports present, as no distinction is made between immunologic reactions and other kinds of food reactions (Teufel, et al., 2007).

The most common allergens in Europe and the US are reported to be peanut and nuts, causing life-threatening reactions (INFOSAN, 2006). Eight different foods and ingredients are listed by the Codex Alimentarius Commission Committee, described in terms of the most severe reactions and the highest incidence of cases regarding food hypersensitivity on a global scale. These are:

- Cereals containing gluten, i.e., wheat, rye, barley, oats, spelt or their hybridised strains and products made from these;
- Crustacea and products made from these
- Eggs and egg products
- Fish and fish products
- Peanuts, soybeans and products made from the latter
- Milk and milk products (lactose included);
- Tree nuts and nut products; and
- Sulphite in concentrations of 10 mg/kg or more (CACC, 2019).

How and when reaction occurs differs from one individual to another. Allergic reactions vary from slight to severe. Unfortunately, an allergic reaction can be fatal at times. This all depends on the individual, dose, food type and other possible co-factors (Teufel, et

al., 2007). Symptoms are caused to protect the organism from allergens and are hence considered as defence mechanisms. However, if one is not aware they can become harmful. Symptoms can be noticeable within minutes or several hours after digesting the allergy food item (EAACI, 2014). Symptoms may also vary depending on the level of sensitivity, food type and dose amongst other possible food factors (Teufel, et al., 2007).

Generally, allergic reactions are related to the skin, stomach and intestines (digestive tract) and the mouth and airways (respiratory system). Hence, symptoms can be divided into four groups:

- Skin Symptoms
- Digestive Symptoms
- Respiratory Symptoms
- Life Threatening Reactions (Anaphylaxis) (Institute for Quality and Efficiency in Health Care, 2020))

2.7 Laws and Regulations

The Food Safety Act (CAP449) of 2002 which includes the Hygiene of Food Regulations (CAP449.31) is the principal form of legislation related to food in Malta, which aims to prevent food safety risks. These food laws and regulations set the requirements, procedures and general principles concerning food safety, including all phases of the food chain, from food production to distribution and sale of food (Food Safety Act, 2002). Besides the local legislations, Malta must also observe any EU legislation and regulation.

EU regulations are also mandatory not only in Malta but across all European countries. Regulation (EC) 1169 of 2011 on the provision of food information to consumers is the latest regulation which entered into force in all member states, including Malta. This regulation has replaced two EU Directives: Regulations 2000/13/EC and 90/496/EEC and other legislative acts for specific categories of foods. 2000/13/EC referred to the labelling, presentation and advertising of foodstuffs, while 90/496/EEC referred to the nutritional labelling of such food items. Several changes also came into force that stipulated the provision of clear information to consumers.

Reg EC 1169 of 2011 specifies the supplying of details relating to ingredient items that contain any of the EU 14 allergen [Appendix 1]. by each member state. Hence, in order to determine improved legibility of information, allergen ingredients must be emphasised by *colour*, *font* or *style* for prepacked food. For non-prepacked food items, food allergen information must be made readily available to customers through notices, allergen matrix and online information in case a customer asks for specific information due to dietary requirement (European Commission, 2011). The same labelling requirements are mandatory for online, distance selling or buying in a shop. Through Reg (EC) 1169 of 2011, catering and food businesses must provide customers with information on the EU's 14 major food allergens if included in any food production they produce, serve or sell.

Such legislation was set after several discussions and debates with different people coming from various sectors of the food industry. However, most importantly, diplomats rely on expert advice from allergy experts (Vapnek & Spreij, 2005). Although such legislation is in place, there are still some gaps in this area. For instance, when a peanut-allergic patient buys a *figolla*, this is traditionally made with an almond paste filling, but is sometimes bulked up with peanut paste without proper labelling. Such a possibility highlights the importance of declaring allergens.

2.8 The Food Industry and Allergies

The catering industry is the sector that tends to have the most direct contact with food allergy sufferers, being that it deals with food preparation. Although studies are always ongoing, there is still lack of research about the way that the food industry manages food-related allergies (Pacholek, et al., 2018). One particular study conducted locally focusing on food allergy management in small food service business (Schembri, 2017) identifies a lack of understanding of food allergens by the staff of small businesses in Malta.

Reg (EC) 1169 of 2011 aims to protect consumers and avoid allergic reactions, including those due to possible contamination with traces of allergenic material during the process of food preparation. In fact, article 36 of the same regulations stipulates that "information on the possible and unintentional presence in food of substances or products causing allergies or intolerances". This information should be based on a risk

assessment. This also resulted in food business operators starting to include a precaution allergen labelling on the packaging such as ‘may contain’ (Soon & Manning, 2017).

In cases where food is not prepacked, such as in hotels, restaurants or cafeteria, information is to be provided orally or through a dish name tag that is displayed on counters. Nevertheless, the food business operator must indicate that customers can obtain details on the product by asking a member of staff. This could be achieved via a notice, statement on the menu or label that is clearly visible to customers (Carbonelle, 2019).

In recent years there has been an increase in concern and misconceptions amongst Maltese citizens about food allergies. Many have started to question whether health issues, especially those related to skin diseases, are the results of an allergenic reaction and whether dietary alterations and restrictions are needed. For instance, are eczema and acne caused or worsened by certain foods? Having limited evidence of the links between eczema and acne to particular food allergens, a healthy balanced diet is recommended rather than restrictive ones (Mercieca & Scerri, 2016). Questions are also asked concerning the possibility of food allergies causing other medical conditions.

Although the subject is increasing in terms of interest amongst the Maltese, it is mainly seen from a medical point of view. However, the necessity for food allergies to be considered by different sectors in society, one of the most significant being the catering industry in Malta, is great. The latter is particularly crucial since employers and employees deal with potential allergens on a daily basis during their work routines (Spiteri, 2015). .

According to a local study conducted by Sammut (2005), out of 469 answers amongst random participants, 28.4% suffer from a food allergy (Sammut, 2005). This study emphasises the awareness of food allergens around the Maltese islands. Although our local hospital does not have an allergy clinic as many professionals suggest, allergy services are currently provided according to symptoms, such as allergic asthma, which is seen to by respiratory specialists, with gastrointestinal conditions dealt with by gastroenterologists (Gouder , Sammut, & Montefort, 2019). Otherwise, many opt for professional advice from their family doctor.

According to Carabott (2019), not enough awareness is present in Malta concerning this subject. Porter (2019) carried out a study in local schools whereby she found that children with allergies are being bullied because of their health condition. An example of the latter occurs when milk is provided to children in schools, including the option of lactose-free milk. However, children who are allergic to milk protein are not being offered an alternative (Carabott, More Guidance Required on Food Allergies - Nutritionist, 2019). This raises the importance of education on the subject, which must be implemented from a young age. This is of the utmost importance where there is even a single student with a food allergy in a particular school.

2.9 Knowledge and Training on Allergens in the Food Industry

Food industry employees' knowledge and clear information is a must for customers with food allergies. Tarro et al. (2017) identify four components that are essential when catering for customers with a food allergy:

1. Providing the nutritional and allergen analyses of each dish
2. Increasing the number of healthy food choices
3. Identifying menu items associated with allergies and intolerance
4. Training staff about healthy eating and allergens

Applying these four components to food industries has expanded the number of choices of healthy and free allergy foods options (Tarro et al, 2017). Clearly, restaurants with clearer menus and well-trained employees will most likely inspire greater trust in customers and reduce the risk of an allergic reaction from food.

Although during their education most chefs have come across some lectures related to allergies, this may only cover the basics about major food allergens. Training courses should not only cover minimal information, but also involve other topics, including causes of food allergy reactions, food allergy risk communication, menu items containing food allergens, preventing cross contamination with allergens and preparing for an allergic reaction. (Kwon & Wen, 2016). Furthermore, since medicine and technology are always evolving, it is essential to keep up to date with the ever-evolving situation, which is why training must be provided not only to new employees but also existing staff from time to time (Anderson, 2019).

Although the importance of training is emphasised, many establishments find several barriers to planning training sessions. These include:

- the cost of engaging a trainer
- allocation of premises to carry out the training
- high labour turnover rate
- lack of interest in implementation of the training during work and time constraints, amongst others (Kwon & Wen, 2016).

Training and knowledge about allergy necessitate improvement and planning in such a way that is cheap, easily accessible and relevant to avoid and reduce such barriers (Kwon & Wen, 2016).

Training should be held regularly for all employees within the catering industry. Such training should include the understanding of the effect of food allergens and food tolerance, knowing how to apply changes to European and local legislation, providing a responsible service to clients, knowing what to do in case of an allergic reaction and attaining familiarity with the 14 major allergens (Popov-Raljic, et al., 2017) [Appendix 1]. A sample training presentation was provided by human resources department of a particular 5 star-hotel in Malta, which covers substantial information on food allergies, as can be seen in Appendix 4.

Several studies were conducted in relation to different training programmes' outcomes. Bailey et al (2014) designed and evaluated a food allergy educational intervention focusing on food allergy basics, food labelling, accidents, emergencies and communication with customers (Baily, et al., 2014). Dittmar et al. (2014) conducted an online programme on the best practices in relation to food safety (Dittmar, et al., 2014). Padua et al (2018) refer to online training which includes both lectures and the optimum practices at the workplace. All training and courses were reviewed, with positive feedback including the effectiveness of the training and its contribution to the improvement of both knowledge and practice, amongst others (Padua, et al., 2018).

2.10 Food Allergy Communication

According to the European Legislation Regulation 1169 of 2011, verbal communication related allergic to food and/or ingredients must be declared but under certain conditions:

- staff must be able to provide information at the consumer's request without extra expense and delay; also, prior to purchase
- written procedures must be applied by the establishments to make sure that correct and consistent information is provided
- internal procedures must be well known by the staff (Youmeal, 2018)

Customers with food allergies have highlighted the fact that miscommunication between and amongst food servers and customers about food allergy ingredients and cross-contact during food preparation is a major cause leading to allergic reactions in restaurants (Kwon & Wen, 2016). This has been seen in a study conducted by Wen and Lee in which out of 291 valid responses, around 70% of the participants experienced food allergic reactions in restaurants. However, only 15% of them could communicate with employees before placing an order (Wen & Lee, 2020).

Food allergy communication can be seen as a process happening within a broader work context characterised as a socio-technical system made of technical and social elements within a working environment (Wingate et al, 2021). Good food hygiene and food safety practices in the food industry require clear policy and procedures related to allergy management and communication. This directly affects the information needed about food preparation, food-handling and customers' needs (Wingate, et al, 2021). Allergy communication is also affected by social elements such as attitudes and beliefs. Nonetheless, the working environment is also another component that affects allergy communication (Wingate et al, 2021). These three elements need to be taken in combination in order to address allergy communication.

Allergic reactions often occur as a result of misinformation to/from the consumer or due to bad hygiene practices in the restaurant, such as cross-contamination or hidden ingredients (Stallings & Oria, 2017). Hence the importance of training and communication between and amongst customers and food servers is a crucial step towards preventing food allergy reactions in establishments (Kwon & Wen, 2016).

2.11 Allergen Management Plan

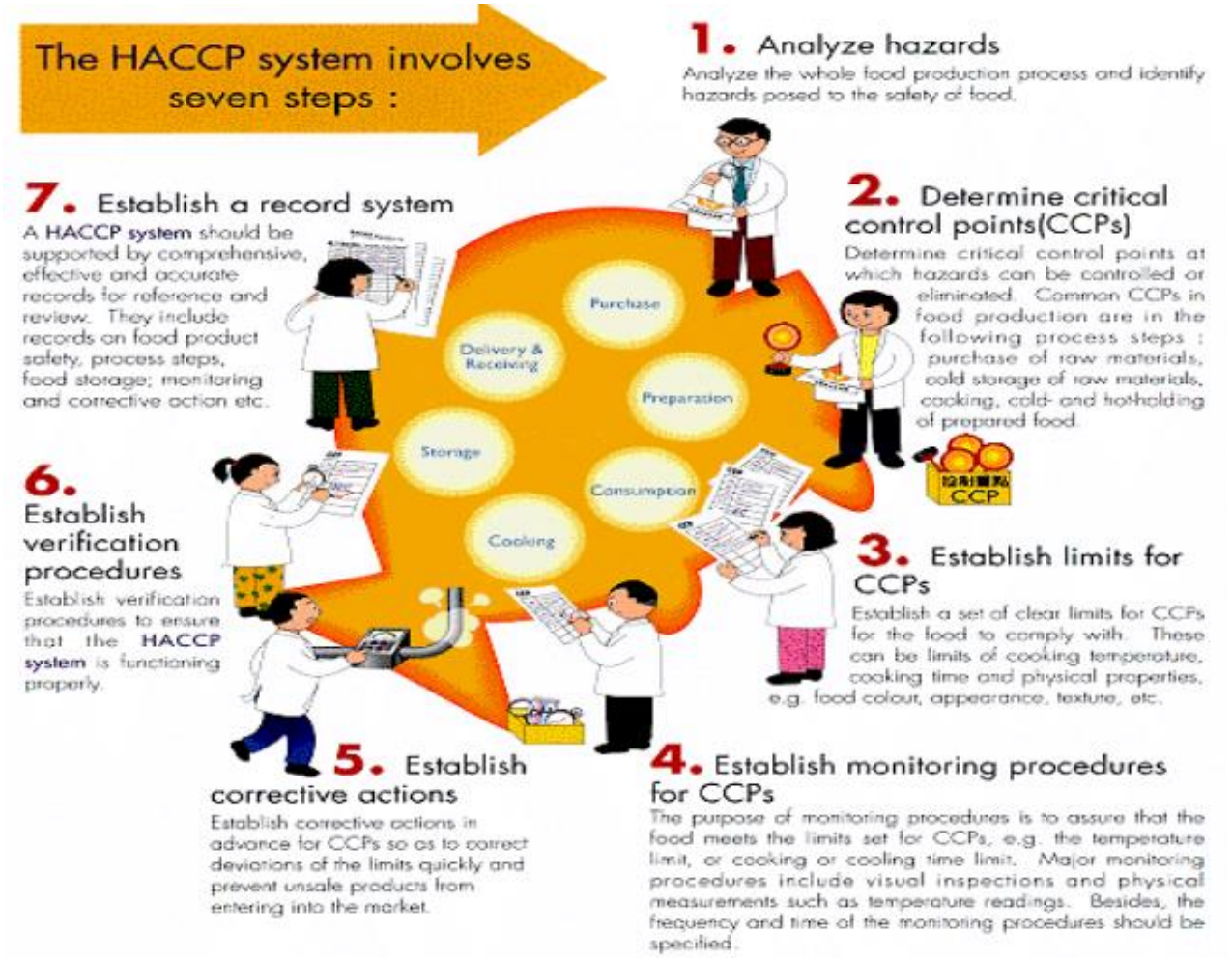
All catering establishments are required to have food safety procedures based on the Hazard Analysis and Critical Control Point [HACCP] principles as per EU legislation 852 of 2004. European legislation on food safety is required to be followed by the members of each enterprise to ensure that food products do not constitute a risk to human health. HACCP principles ensure the safety of food by identifying specific hazards and how to control them. HACCP rules create a control system focussing on prevention rather than reactive solutions (European Commission, 2015). In simple terms, HACCP identifies, evaluates and controls hazards significant to food safety.

It was first developed by NASA in the 1960s for the production of safe food for space flights (Hulebak & Schlosser, 2002). In 1995 the European Economic Community issued the first directives (Directive 93/43) which required producers to implement a control system built on the principles of HACCP, in which full responsibility was placed on them. Directives and regulations have, since then, been changed and adapted to everyday life standards.

The Codex Alimentarius HACCP was issued internationally by the Codex Alimentarius Committee. It includes hygiene principle based on four aspects:

- the analysis and trace of hazards
- the evaluation of their importance
- the determination of critical control points
- the documented control and verification of the preventive measures (Commission J. F., 2003)

Figure 1 shows a flow chart outlining the abovementioned seven principles of HACCP (Deshmane, n.d.).



Under HACCP, allergens are identified as chemical hazards. Like other food safety hazards, allergens must be controlled by following a systematic risk-based approach. A HACCP allergen control programme is required to maintain food safety for customers (FDA, 2022). There are different ways in terms of how to develop a HACCP Allergen control program; however, all carry the same aim; that is, that of ensuring food safety.

A HACCP allergen control programme is developed:

- to identify potential allergens
- to prevent cross-contamination
- to ensure correct labelling
- to enable correct documentation

- in order for an expert allergen control team to be created
- for allergy policies to be followed (Njunina, 2021).

Once the HACCP allergen control program is in place, it is important to ensure that correct control measures are followed according to the programme developed. This is done through an allergen control checklist; for instance, specifications and a certificate of analyses for the raw materials are to be provided by suppliers. Production schedule is also required in case of the workspace being limited that can result in cross-contamination. Between each schedule a complete cleaning programme must be followed (Njunina, 2021). Nonetheless, regular reviews and updates are essential in case of developments and changes.

As the number of allergy sufferers seems to be on the increase, it is becoming more important for establishments in the catering industry to know how to serve guests suffering from such allergies (van Dam & Wiersma, 2012). It is also important for establishments to follow clear written guidelines and procedures. These must be explained during staff training. Management must make sure that such procedures are accurate and up to date (van Dam & Wiersma, 2012).

Allergy management plans must be established in each catering business based on the HACCP principles. The allergy management plant is tailormade for each food business, such as restaurants and hotels, in order to control food allergens, train employees on handling food allergens and to communicate the risk and presence of food allergens to guests (Merckaert, n.d.). A written plan helps minimise the risk for both establishment and guests.

Such a plan should be specific to the particular establishment's setup. When serving guests with food allergies, the 4Rs should be adopted by the staff constituting both front and back of house:

Step 1: Refer the food allergy concerned to the chef, manager or person in charge

Step 2: Review the food allergy with the guest and check ingredients' label

Step 3: Remember to check the preparation procedure for potential cross-contact

Step 4: Respond to the guests and inform them of your findings (Schaefer, 2019).

It is important for management plans to be based on regulations and laws. Restaurants should keep track of the 14 common food allergies identified in regulations, used in recipes and found on menus. A management plan must include a list or matrix with menu items including all ingredients and any allergy food, hence staff can easily respond to customer questions about allergies by referring to this list (Merckaert, n.d.).

Knowledge, co-operation between departments and teamwork are the main factors in serving guests with food allergies safely. Figure 2 shows the basic important elements in the management of allergenic risks (Popov-Raljic, et al).

2.12 Food Allergy Emergency

Prevention is better than cure, however customers with food allergies are always at risk of accidental exposure as a result of human error. Potential errors can occur during the process of ordering, preparing or delivering food. Such errors can include miscommunication or failure to disclose the allergy, incomplete food labelling, cross-

contamination, hidden or undeclared allergens in the menu and others (Carter, Pistiner, Wang, & Sharma, 2020).

Such accidents may result in an allergic reaction which can be fatal (Carter, et al 2020). In case of accidents, food-handling establishments must always be prepared and have an emergency plan in place. Staff must be trained to give immediate response and ensure that their customers are safe and get the help they need.

In the event of such an unfortunate occurrence, the first step is to call the 112 emergency service number and describe the individual having an allergic reaction, as well as the nature of the reaction. If the restaurant owns an EpiPen auto injector, it is of paramount importance to ensure that everyone knows where it is located and how it is used. Such an aid is normally injected in the thigh through clothes (Holroyd, 2021). This may also be owned by the individual too. It should be administered immediately. Once the person is out of the premises the restaurant must debrief and identify the course of events to try to improve its procedures and avoid other such occurrences (Holroyd, 2021).

Chapter 3. Methodology

This chapter discusses the research methodology of the dissertation. In this portion of the dissertation, the research strategy, method, approach, strategies of data collection, selection of the sample, research process and the type of data analysis have been outlined and explained in detail.

The aim of this study is to evaluate how kitchen staff working in local 5-star hotels deal with food allergies. This was done by means of a questionnaire. Data was gathered from members of staff occupying different positions working in the kitchen, from the kitchen help to the executive chef. This kind of survey was found to be the best option to gather data from kitchen staff due to the latter's busy environment.

3.1 Research Strategy

The research strategy utilised for this study is an applied one. Applied research is a strategy that is based on the answers provided. To this end, a solution is provided affecting individuals, a group or society. This study provides in-depth conclusions to the research, as well as several recommendations for local 5-star hotels.

Given the access to several academic research studies which were carried out on food allergies, this study is based on a currently existing research subject. However, only a small number of the works available focus entirely on the Maltese islands, in particular 5-star hotels, which constitutes the emphasis of this study. The results of this research have been also compared to similar studies held in foreign countries.

3.2 Research Method

The research method used for this study is a quantitative one. The quantitative method for this research is being used because of the statistics and numerical study of facts gathered through a standardised quantitative questionnaire. The main purpose of a quantitative research method is to simplify the study by gathering information from a small number of individuals out of a large population. Quantitative research results are based on the data collected from the chosen sample (Jain & Chetty, 2020). The

quantitative method allows the measurement of facts before and after the questionnaire since it is based on numerical data and uses a deductive form of reasoning. According to Dr Set et al., quantitative research is a scientific method, as it is objective and uses statistical method for data collection (Seth, Chadha, & Bhatia, 2022).

For this study the quantitative method is used because data is collected in the form of statistics, thus donating a more objective slant to answers. The qualitative method is used when data being collected is not in numeric form. Its aim is to evaluate and understand the experience of individual's lives and social worlds (Fossey, Harvey, Mcdermott, & Davidson, 2002). For my study, facts are collected from the chosen population, hence the reason for eschewing this method.

3.3 Data Collection tool

Data sources for the purpose of this study were collected in a form of questionnaire, in which questions were created to collect information in order to explore the research subject. A set of questions were drafted and the participants asked to answer these by either checking one or more choices from among the possible answers listed, or writing out a short answer. The questionnaires were used to collect two types of information: facts and opinions (Thomas, 2003). For this study, facts were requested as the main type of information, to assess the knowledge of food allergens by kitchen staff in local 5-star hotels.

Furthermore, questionnaires were used to acquire detailed material and evidence related to food allergy management in 5-star hotels around the Maltese islands. A structured questionnaire includes a mixture of multiple-choice questions and dichotomous ones. The questionnaires were distributed at the workplace by the human resources department. Being a busy environment, for the kitchen staff such types of questions were found to be the easiest and most efficient way to answer, at the same time being effective for data collection. Moreover, the staff were allowed enough time required to answer the questionnaire and were asked to return it on concluding it.

Questionnaires were given to the human resources personnel to distribute to their kitchen staff randomly and were therefore anonymous. They were completed by the staff themselves either at the workplace or at another location and sent back through the self-addressed envelope including postage. All 5-star hotels and respondents were given the guarantee of anonymity.

3.4 Sample Selection

A probability sampling method was used for this study. This involves a random selection of participants from the population, in which each individual had an equal chance of selection (Nikolopoulou, 2022).

A sample selection was garnered from the 5-star hotels around the Maltese islands, with a total of 14 hotels in Malta and another 2 hotels in Gozo. In this regard, 6 questionnaires were distributed to each 5-star hotel in Malta and Gozo in a self-addressed envelope. A total of 96 self-addressed questionnaires were distributed, however, 66 (68.75%) questionnaires were received. No other kind of communication was made with the participants in order to ensure complete anonymity.

The questions were specifically designed for a particular target group, being the kitchen staff, and were related to food allergy management and the overall experience of working in 5-star hotels in Malta and Gozo. Since the study is related to allergies in 5-star hotels, this population offered the best means for the accumulation of data to answer the research questions.

3.5 Data Analysis

The questionnaire's data analysis was completed and followed by the automatically generated report through Microsoft Excel.

Data gathered through the questionnaires was processed using an inductive reasoning without assumptions. As described by Bougie and Sekeran, induction approach is established upon the analysis of the data and information based on primarily collected data and theoretical conclusion (Bougie & Sekeran, 2019).

An intensive analysis based on the answers from the questionnaires is carried out in the next chapters and discussed throughout, duly sustained by the literature utilised. The analysis is presented in different ways with graphs, tables and timelines, amongst others.

3.6 Limitations

Throughout the study, several limitations were encountered which narrows the scope of the findings and limits the reliability of the research. As Roberts (2018) stated, limitations are weaknesses of the study. The main limitations for this study include the following:

- The sample was limited to 5-star hotels. With only 14 in Malta and another 2 in Gozo available, research depended solely on these establishments. The sample included 96 employees, with only 68% respondents.
- The target audience, that is, the kitchen staff tended to be busy during their shift and consequently completed the questionnaire in a hurry.
- Others may have opted to give the questionnaires to relative or friends to fill it in for them.
- Questionnaires were mainly distributed in the self-address envelope, with some employees refusing to complete the questionnaire and/or sending it back.

Another limitation was the language. Questionnaires were distributed in the English language, with the assumption that the majority of the employees were fluent in the language, being one of the two official languages in Malta. The risk was that since many foreigners are typically employed in the catering industry, some may not have been familiar with certain keywords. This also applies to locals who are not conversant with English.

The study only included 5-star hotels located in Malta and Gozo. Therefore, the results collected through this study cannot be generalised to all the service and kitchen staff of different types of catering establishments.

3.7 Ethical Consideration

The risk for any of the employees in conducting the questionnaire for the purpose of this study in an uncomfortable situation was avoided at all costs. No pressure or obligation was placed on the respondents and participation was voluntary. No consent form was required in this respect, hence participants participated in the study out of their own free will and without being subject to any form of coercion or deception. The questionnaire started with a brief introduction about the researcher, the course programme being followed as well as the study and included an anonymity and confidentiality clause [Appendix 5].

The questions were constructed in such a manner to enable respondents to introduce themselves in terms of their job, age, experience etc. The next set of questions was related to their knowledge about food allergens, followed by another set of questions related to the management of the relevant establishment.

Chapter 4. Results and Discussion

4.1 Introduction

The aim of the research was to explore the knowledge and handling of allergies in 5-star hotels in the Maltese islands with the use of quantitative research, as elaborated in Chapter 3. The results of this research will be enlarged upon and discussed throughout this chapter. Through Microsoft Excel, the questionnaire was statistically analysed. The results obtained are presented and discussed in this chapter. The questionnaire can be found in Appendix 5. A total of 66 kitchen staff working in local 5-star hotels participated in the research.

4.2 Demographics

The questionnaire contained four demographic questions: gender, age, role in the kitchen and years of experience. Graph 1 shows the gender summary of the participants. The male gender supersedes the female one, with 78.5% being males and 18.5% being females. Another 3% of the sample opted not to answer. As per figure 1 below, the most common age of the participants was that of between 30 and 35 years of age while the least common fell in the 19-24 years bracket, amounting to 9.2%.

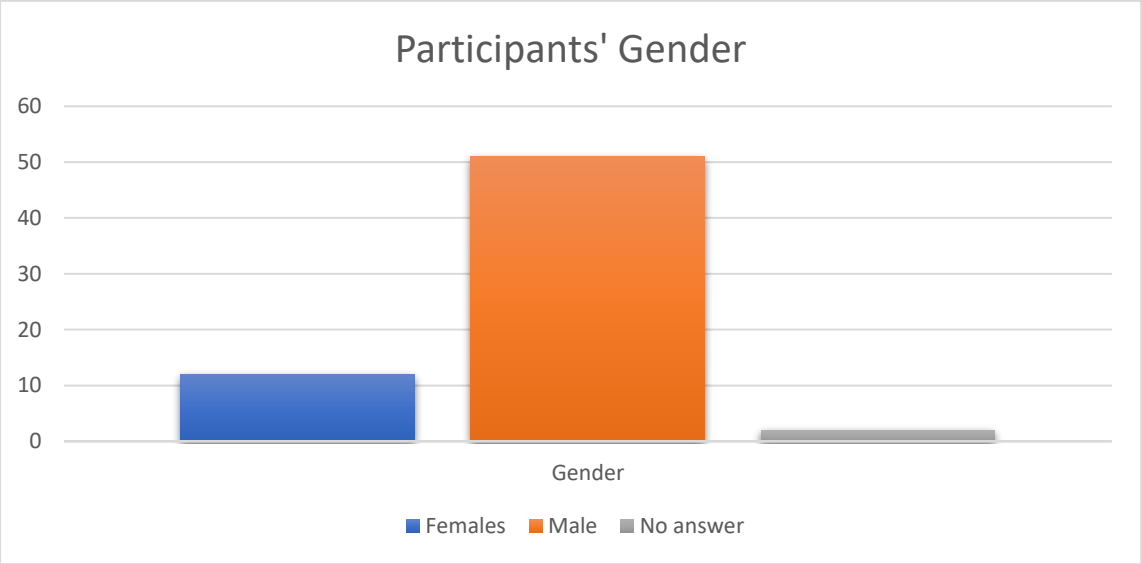


Figure 1: Participants' Gender

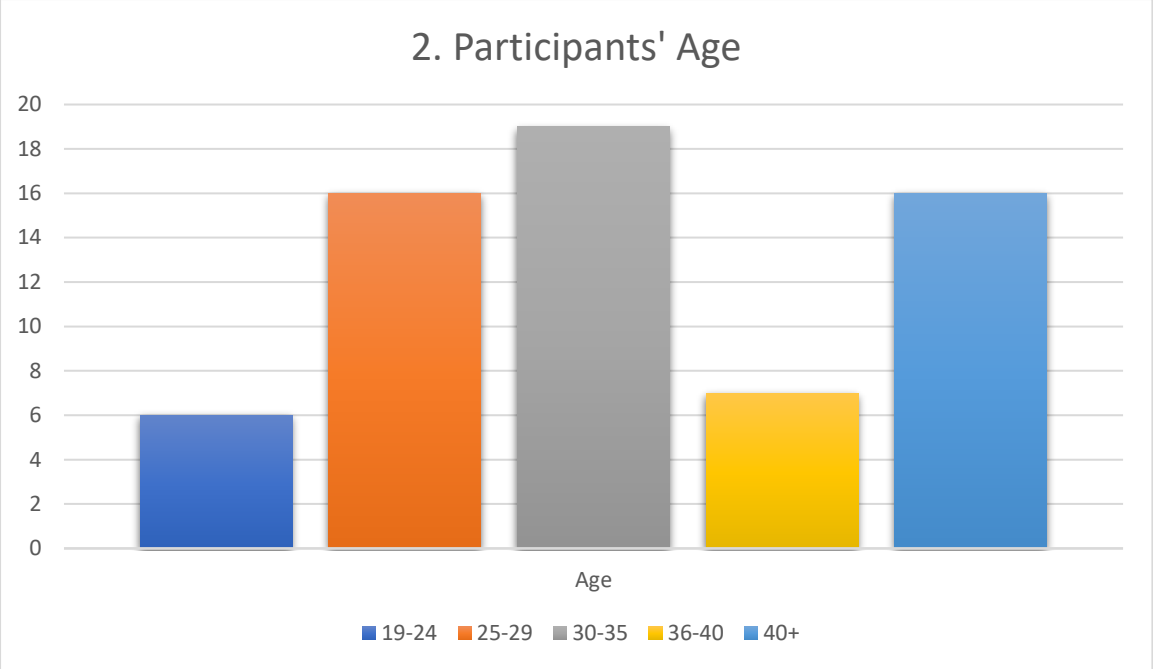


Figure 2: Participants' Age

Participants for this study occupied different positions within food management operations. Most food industries adopt the *brigade de cuisine* system to employ extensive staff. This is adopted to delegate different responsibilities to several individuals. For this research, the chef de partie role was the most common position held by the participants who took part in this research, also including executive chefs, head chefs, sous chefs and commis chefs as per figure 3.

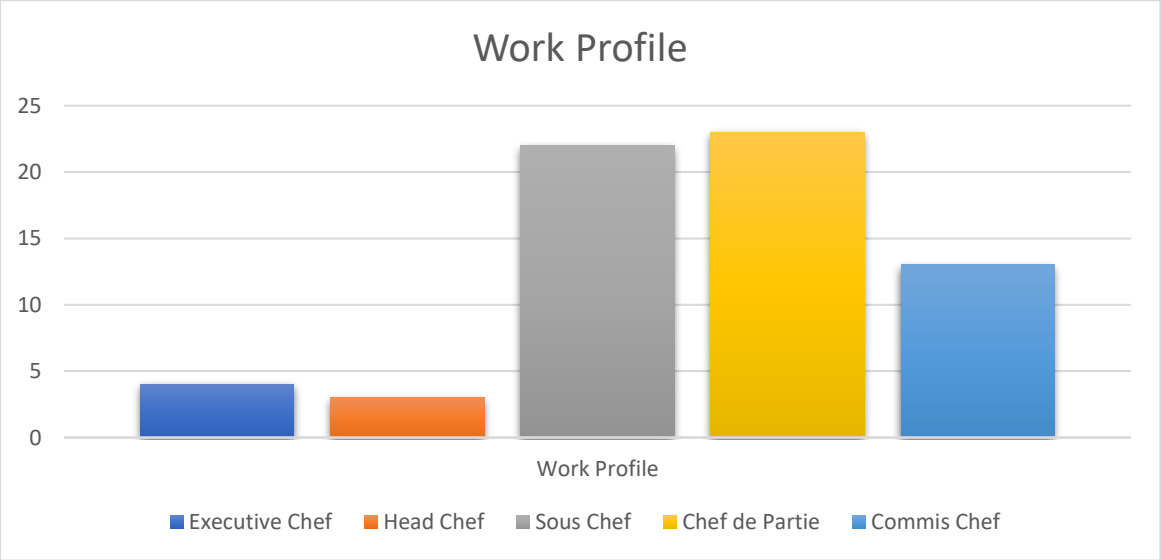


Figure 3: Work Profile

The years of experience working in 5-star hotels were demanded for this study for further data related to the respondents' profile. From the sample, the majority of the respondents had been working in 5-star hotels for more than 5 years (60%), with one respondent indicating 29 years of experience currently occupying the position of head chef. Figure 4 gives a summary of the participants' years of experience working in 5-star hotels.

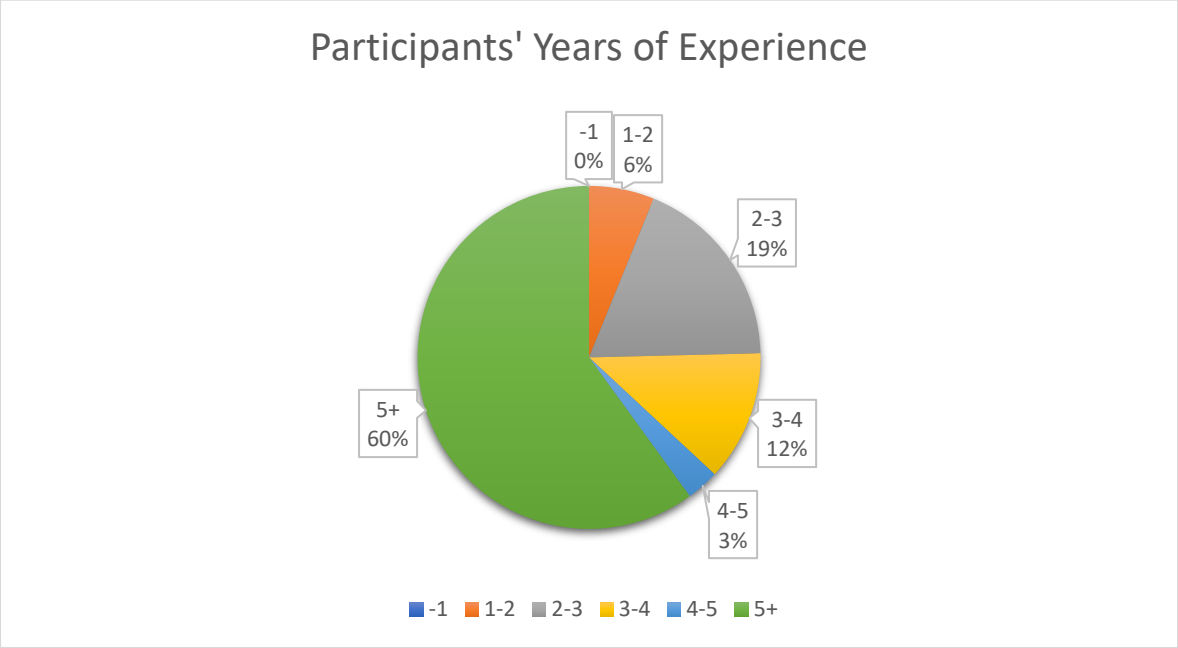


Figure 4: Participants' Years of Experience

4.3 Discussion

4.3.1 Laws and Regulations

5-star hotels in Malta, like other food establishments, must ensure that they abide by all local and EU requirements related to the safety of food-handling and other consumable items. In addition, food establishments are required to follow safe food-handling procedures to prevent food contamination in line with these regulations. Through these policies and proper enforcement, less occurrences are likely and a better quality of life can be forged for food allergy consumers.

Participants were asked two questions in relation to the legal aspect of food allergy management. When questioned about the requirement to provide allergy information

as stipulated by law, out of 66 responses, 5 of them were not aware that the law demands that allergy information be provided. These occupy the positions of head chef and chef de partie, with their ages being over thirty-six. This shows that although years of experience are involved, knowledge of the subject is still lacking, hence the reason for training to be regularly provided. The experienced chefs are expected to approach food allergies consciously. In the study conducted by Loerbroks et al. (2019) in Germany, it was concluded that food allergy knowledge among restaurant staff was 'suboptimal'. However, it was highlighted that managers and staff with the highest school qualifications were more aware of allergen labelling regulations (Loerbroks, Tolksdorf, Wagenmann, & Smith, 2019).

When asked about which law imposes the need for allergy information to be provided, the participants were given the choice between Labelling, Nutrition or Food Hygiene Requirements and Fortified Food. 51 (78%) participants marked Labelling as the correct answer, 8 (12%) participants marked Nutrition or Food Hygiene Requirements while 6 (9%) participants marked both. None marked Fortified Food. This shows that the majority are aware of such legislation, however this does not mean that this is always observed in a correct manner.

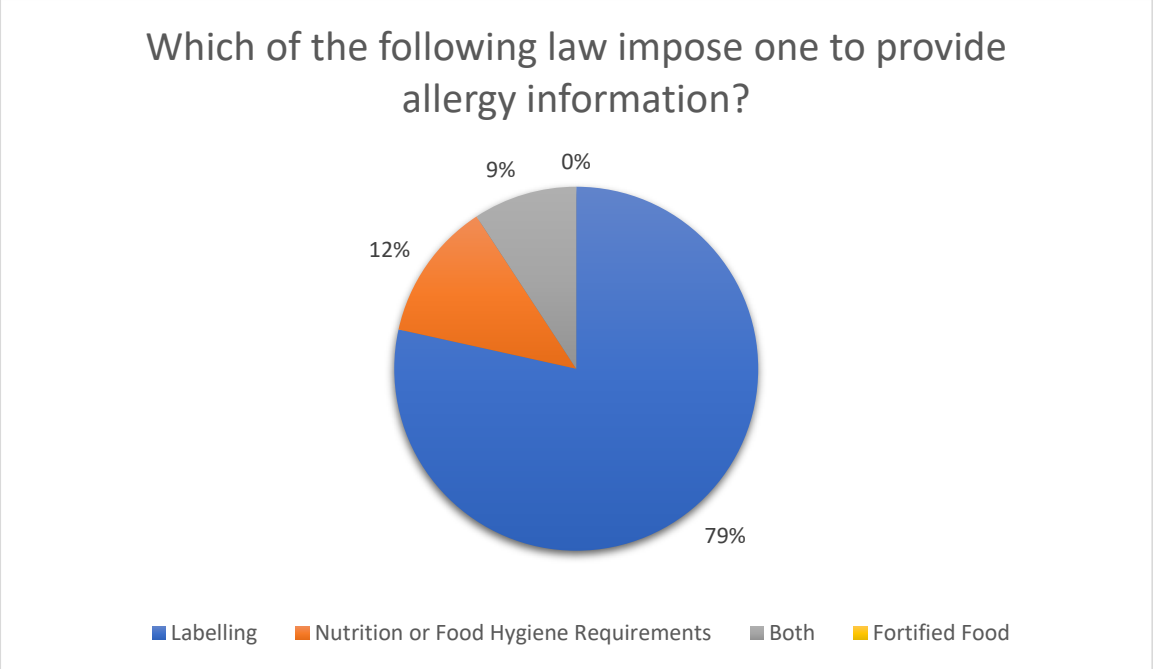


Figure 5: Laws and Regulation

A case study about food safety awareness was conducted in Turkey and Nigeria (Cavus, et al., 2019) among chefs and culinary art students. The results revealed that only 40% of the chefs read the information provided on the food packaging. Since chefs have a main role in food preparation, the study emphasised that it is required and expected for chefs to be concerned and interested about the information available on the packaging (Cavus, Ismail, & Ozkaya, 2019).

It is against the regulations for food industries to refuse to provide information specific to allergen ingredients. Also, catering companies cannot provide misleading or incorrect information. Allergy ingredient information must perennially be available and easily accessible. Chefs must check all labels on every ingredient in order to make that sure no allergens are listed. If the information is not provided, chefs are obliged to ask the suppliers to provide the allergenic information about the items bought. It is also mandatory for food labels containing allergen information to be saved. A recipe card can also be created for each recipe in which allergen ingredients are highlighted, including compound ones (Council, n.d.).

For the same study (Cavus, et al., 2019) another question was asked relating to whether allergen warnings were encountered in the purchase of packaged food. Results indicated that the majority of catering professionals in Turkey did not. The same was found to be the case in Nigeria, amounting to 34.8%. Another 32.6% in Nigeria were uncertain (Cavus, Ismail, & Ozkaya, 2019).

Nationality	**Yes**	**No**	**I do not know**
Turkish	13.3%	66.2%	16.4%
Nigerian	32.6%	34.8%	32.6%

Such legislation also garnered criticism from the chefs' side regarding catering for allergic customers. In fact, in 2015, over 100 top chefs in the UK had contacted a leading newspaper; namely, the Telegraph, criticising the compromise of creativity and spontaneity in dishes due to being obliged to inform customers about the presence of the 14 allergens (Smith L. , 2015). This shows that over 100 chefs in the UK do not have enough knowledge about the seriousness of an allergy. In 2007, the FSA in UK conducted a survey amongst consumers, in which only 15% of respondents declared that they are aware of specific rules about allergens (FSA, 2018).

In USA, the Food and Drug Administration (FDA) is the organisation responsible for assuring that foods in the United States are safe and properly labelled (FDA, n.d.). In the UK, the Food and Labelling Regulations were introduced in 1996 (Regulations, 1996). In Turkey, the Food Labelling Regulation was introduced in 2017 (FAO, Turkish Food Codex Regulation on Labelling, 2017), while no such regulation is enforced in Nigeria.

When comparing results from different countries, it can be seen that staff in 5-star hotels in Malta are further ahead than chefs and students in Turkey and Nigeria in terms of laws and regulations. The same can be said when compared to the survey carried out in the UK, which shows a relatively small percentage of respondents who are aware of rules concerning allergens.

For this study, the knowledge demonstrated by staff of local 5-star hotels was further tested when they were provided with seven foods or ingredients and asked to identify them according to their status as major allergen food as per Reg EC 1169 of 2011. The list included peanuts, tomatoes, milk or dairy products, strawberries, shellfish, eggs and chocolate. The correct ones are peanuts, milk or dairy, shellfish and eggs, as approved in the list of allergens as identified in the EU regulations, however, only 52% of the participants managed to list the four of them. Although none of the other foods or ingredients were selected – that is, - tomatoes, strawberries and chocolate - the other 48% of the participants failed to identify all four major allergens, with 28% choosing three ingredients, 9% two while 11% chose only one food or ingredient, the common being peanuts. Peanuts are one of the food ingredients with the highest incidence of acting as a trigger for food allergies. In Europe, 0.2% of the population is allergic to peanuts (Zuberbier, 2021). Peanut allergies are common in childhood. In the United States 2.5% of children may possess an allergy to peanuts (ACAAI, 2022). Since 2010, peanut allergies in children have increased by 21%. Research has shown that 20% of children will eventually outgrow this allergy (ACAAI, 2022).

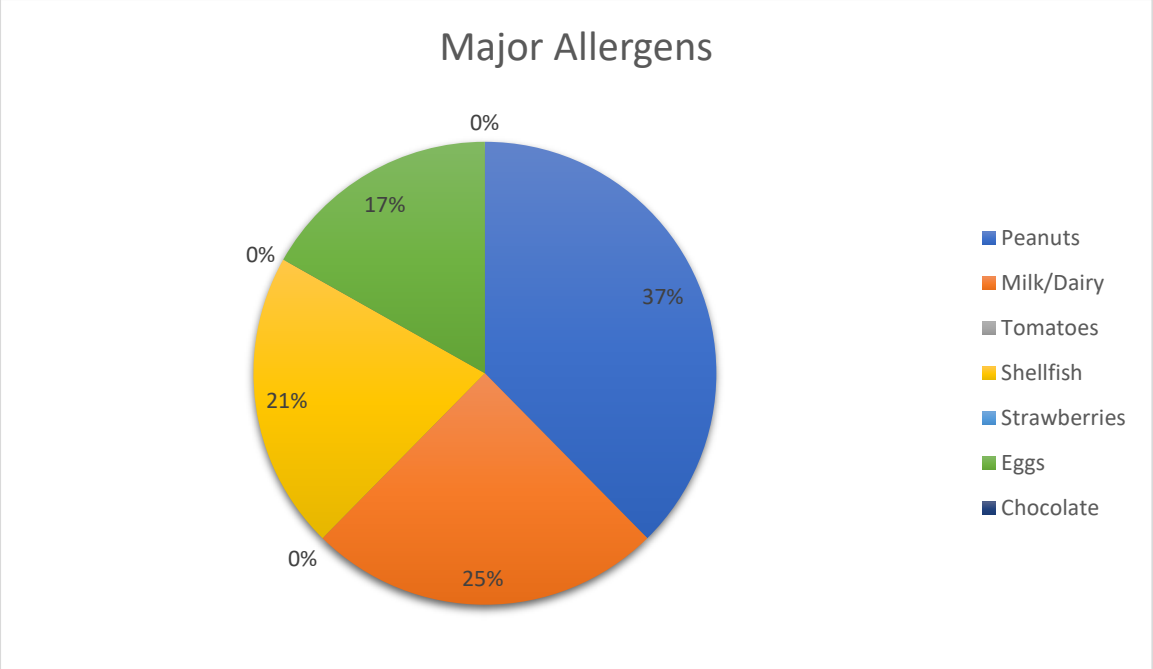


Figure 6: Major Allergens

A similar study by Loerbroks et al. (2019), was conducted amongst staff members in restaurants in Dusseldorf, Germany. Participants were requested to name three out of fourteen common food allergens amongst other questions, out of which only 30% (n=89/295) of the participants named three food allergens correctly. Fifty-four participants out of 295 (18.3%) failed to name one correct food allergen, while others listed one or two correct ones (Loerbroks, Tolksdorf, Wagenmann, & Smith, 2019).

In another study by Radke et al. (2016), conducted in Texas and Kansas in the United States, food workers, amongst others were asked to identify the major allergens. Peanuts (95.3%) were the most common, followed by shellfish (90.5%) and milk or dairy (88.2%). Other non-allergic ingredients were chosen as major allergens, such as tomatoes (22.3%), chocolate (28%) and strawberries (32.2%) (Radke T. , et al., 2016).

In the study conducted by Cavus et al, (2019) in Turkey and Nigeria, similar questions were asked to detect the food allergens from a list of food items. 16.7% of chefs declared that they were unaware of allergic foods, while 12% students submitted the same answer. 4.6% were Turkish while 28.1% were Nigerians. The survey continues to investigate the significance of allergenic foods from different points of view.1.5% of the Turkish and 13.5% of the Nigerians answered that this matter is not at all important.

Other respondents were concerned from about the health and food quality points of view, besides that of food safety. (Cavus, Ismail, & Ozkaya, 2019).

Keeping in mind that this research has been conducted amongst 5-star hotels in Malta and Gozo, it has been demonstrated that further knowledge and training is required about this subject. One critical factor to implement the HACCP procedures successfully is to provide effective training. According to Wallace (2001), awareness and motivation aside from technical and practical knowledge are essential aspects to be conducted during training. However, specialised training on food allergies is uncommon in food industries at all levels, including management (Pratten & Towers, 2004). Food allergy management training must be designed to add further elements to what needs to be regulated, hence trying to alter the behaviour towards food preparation restrictions.

When participants were requested to list the correct food allergens, staff working in restaurants in Dusseldorf and the United States fared better than local professionals. It should, however, also be borne in mind that the number of participants in the Maltese islands is by far limited when compared to that in Dusseldorf and the United States.

4.3.2 Allergic Reactions

Respondents were asked to mark the symptoms of an allergic reaction from the list provided: trouble breathing, hives or rash, headache, swelling of the tongue and throat and fever. 40% of them were able to indicate three symptoms – trouble breathing, hives or rash and swelling of the tongue and throat. 1.5% marked either headache or fever, which are not allergic reactions, and 6.2% selected the five symptoms listed, while the rest selected one or two of the three symptoms. In comparison with a study conducted by Kwon and Wen (2016) on full-service restaurants in the U.S. in which participants were aware of food allergy reactions and their symptoms (Kwon & Wen, 2016), more knowledge and training is needed particularly for staff working in 5-star hotels in Malta.

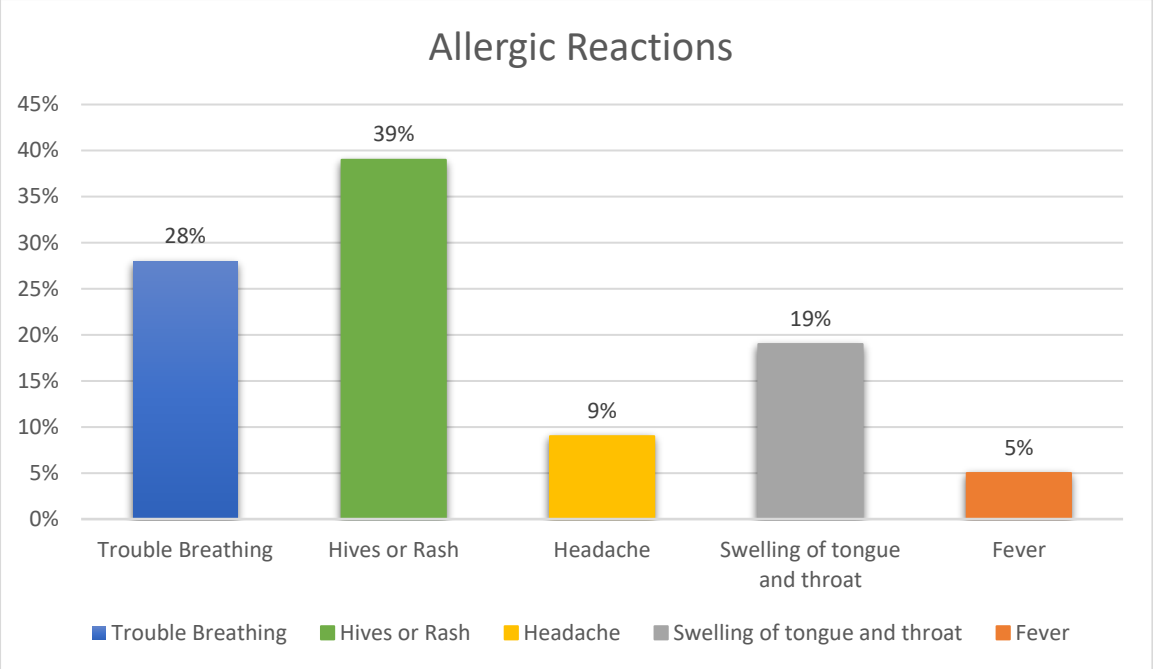


Figure 7: Symptoms of Allergic Reactions

4.3.3 Food Allergies Training

When questioned about whether kitchen staff should be educated and knowledgeable about food allergies, all respondents agreed. All kitchen staff confirmed that it is important for them to be knowledgeable and well informed on food allergies in order to meet requests from food-allergic customers.

The participants were asked to reply ‘yes’ or ‘no’ to questions related to food allergy training. 83.3% of the kitchen staff in 5-star hotels stated that they had received food allergy training. 80% of them declared that training had been provided by the 5-star hotel that they are currently employed with. It should be noted that staff members who attended food allergy training are more likely to answer correctly in the questionnaire than those with no food allergy training. For instance, those who answered correctly regarding the four major allergens have all undergone training, with the exception of two individuals (90%).

According to the study conducted in 2020 by Bucak and Yigit in Turkey, service and kitchen staff require comprehensive food allergy training. The authors emphasise the fact that graduate-level educated staff differ from those educated to high school level.

They conclude that staff should be grouped according to their level of education and that different level of food allergy training should be given to such groups (Bucak & Yigit, 2021). Hence, training material can be applied according to specific work carried out by a particular body of staff at a specific workplace (Schembri, 2017).

Although 84.6% (n=55) of the respondents had attended training on food allergies, not all successfully answered all the questions. In fact, out of 84.6% only 30 of them (54.5%) were able to identify all 4 major allergens in question 7. Furthermore, only 47% of those who attended training were able to identify the correct symptoms in question 8. According to Bucak and Yigit, five-star hotels providing training on food allergy should be obligatory (Bucak & Yigit, 2021). Through training, employees may understand the importance of customers' safety in relation to food allergies. Moreover, through training, employees will gain confidence and knowledge to be able to serve customers with food allergies, while making such customers feel at ease when dining out. In comparison with a study conducted in the United States, food workers strongly agree (64.9%) and agree (35.1%) that they should be well informed and knowledgeable when concerning food allergies. Furthermore, food staff have mistakenly identified strawberries or other food as allergy ingredients (Radke T. , et al., 2016). Although unable to tick the four ingredients, 5-star hotel staff in Malta did not select any other ingredient listed that does not constitute an allergen.

Having a below-average proportion of staff possessing excellent food allergy knowledge, practice and attitudes in Maltese 5-star hotels, training is essential. Food safety training necessitates being integrated into the work schedule to reduce food allergy risks and prevent fatal reactions amongst customers.

In a local study, Schembri (2017) emphasises the importance of training on food allergens in terms of food servers in Malta and Gozo, particularly given the lack of knowledge often displayed. The researcher observed that many food servers resisted training on the subject, hence a 'behavioural change' is needed on the Maltese islands to highlight the consequences of food allergies (Schembri, 2017). Furthermore, in the study conducted by Loerbroks et al. (2019), it was implied that educational opportunities were inadequate. Hence, training resources are to be improved and maintained up to date in order to contribute to food allergy knowledge amongst staff (Loerbroks, et al., 2019).

In a pilot training group in Brighton, the UK, conducted by Baily et al, training was developed in terms of an hour's lecture given to all the restaurants' staff. The response was, unfortunately, low, with eleven participants out of 189 dine-in restaurants attending, which immediately shows the lack of interest amongst employees. Nevertheless, three separate questionnaires were submitted: pre-training, post-training and a 4-week follow up. Answers were compared which demonstrated that both knowledge about food allergies and practice had improved (Baily, et al., 2014). This shows that training is crucial to educate people, for many resulting in a change in their behaviour, as well as more knowledge being displayed about the subject.

4.3.4 Communication

Miscommunication can be one major cause of allergy reactions in the food industry, demonstrating the need for communication procedure to be followed by all members of staff, also taking into consideration the level of knowledge displayed about food allergies by the staff (Kwon & Wen, 2016).

Different procedures are applied by varying establishments. During the research carried out in Kansas and Texas, participants all agreed that they wait for customers to inform them about food allergies. Once informed, the majority opt to inform the manager about special requests, which the manager would deal with directly, providing a contact point between the consumer and chef. Others stated that they communicate directly with the chef, while a minority emphasised that they usually specify the particular request on the ticket sent to the kitchen or into their point-of-sale system (Kwon & Wen, 2016). Procedures must be clear amongst all the staff as to how the team needs to operate in case of a special request related to allergy, together with clear communication amongst all.

A study carried out by Kwon and Wen (2016) also shows that a significant number of consumers do not inform staff about their food allergies to avoid possible social embarrassment. However, it was argued that managers depended solely on information from customers about allergies. Furthermore, customers must provide clear and correct information to the staff so that misinterpretation can be avoided. For example, a precise statement such as 'I am allergic to...' is given more attention than

‘I want to avoid...’ or ‘don’t include...’ (Kwon & Wen, 2016). Allergic reactions are highly likely to occur when customers ordering food believe they are eating safe food and thus refrain from informing staff about their allergy.

It was agreed amongst participants that communication is important to prevent food allergy reactions in establishments; however it was found that training is not provided to their staff. Others were trained to hand over requests related to food allergies to their managers. Certain managers themselves were not even trained in terms of strategies regarding how to deal with food allergy customers (Kwon & Wen, 2016). This shows the lack of importance given to risk communication in training.

The researcher asked a question relating to whether staff members feel that communication is well-handled between the servers and the kitchen staff. The majority amounting to 90.8% (n=59) answered yes while 9.2% (n=6) answered no. It is noted that the 6 individuals who answered no are of the same gender, being females, and within the same age group, being 25 – 35, however these occupy different positions in the kitchen: chef de partie and sous chef.

In UK, the Food Standard Agency conducted a survey in 2007, in which over 71% of the respondents declared that they feel confident about asking staff for more information about ingredients due to concerns about possible allergens and/or food intolerance (FSA, 2018).

Most research on this topic has shown several factors pointing to a need for better food allergy communication. Recommendations for ideal practices include prior training for the staff; also, for fewer members staff to be involved when special requests are made and double-checking to be done through the communication process, amongst other things (Wingate, Jones, Khakhar, & Bourdage, 2021). Nonetheless, managers should encourage staff to attend training that includes proper risk communication related to food allergy.

4.3.5 Allergen-related Food Safety Procedure

Food safety management relies greatly on the staff operating such procedures in order to be practical and effective. Therefore, it is essential that employees are provided with

the necessary tools to guarantee that the handling of allergies is carried out in line with the food safety plan (Schembri, 2017). The food safety manager is responsible for ensuring that the food prepared is safe to be consumed.

4.3.5.1 Menu planning

Targeted participants were asked whether the menu pertaining to the 5-star hotel where they are currently employed displays any information relating to allergens. 14% of the respondents answered in the negative. Local hotels, restaurants and catering owners are required by law to label products containing any of the 14 allergens food included in the EU 1169/2011 list (Commission E. , n.d.). Allergen information can be indicated at different stages, such as the points of presentation (menu), sale or that of supply.

In a study conducted in Leeuwarden, The Netherlands, by Van Dam and Wiersma, respondents were asked whether the establishment where they worked had any menu or other printed documents available suitable for people with food allergies and intolerances (van Dam & Wiersma, 2012) s. Only 11.9% reported that such a menu is in use. This was followed by another question targeted those who worked at a place eschewing such practices. These were questioned about their willingness or otherwise to develop a menu suitable for food-allergic people. 81% of respondents lacking a dedicated menu were unwilling to develop it (van Dam & Wiersma, 2012).

Kwon and Wen, in 2016, confirmed that out of 16 different full-service restaurants, only one offered an allergen-free menu. They found that training is essential for staff to manage food items that are or contain food allergens, hence being able to identify ingredients in menu items and notify guests (Kwon & Wen, 2016).

4.3.5.2 Plan Management in relation to Food Allergies

Kitchen staff in 5-star hotel in the Maltese islands were asked whether hotels have a plan for answering questions before ordering food from food-allergic customers. 96.9% confirmed that there is a plan while 2 respondents indicated that there is none.

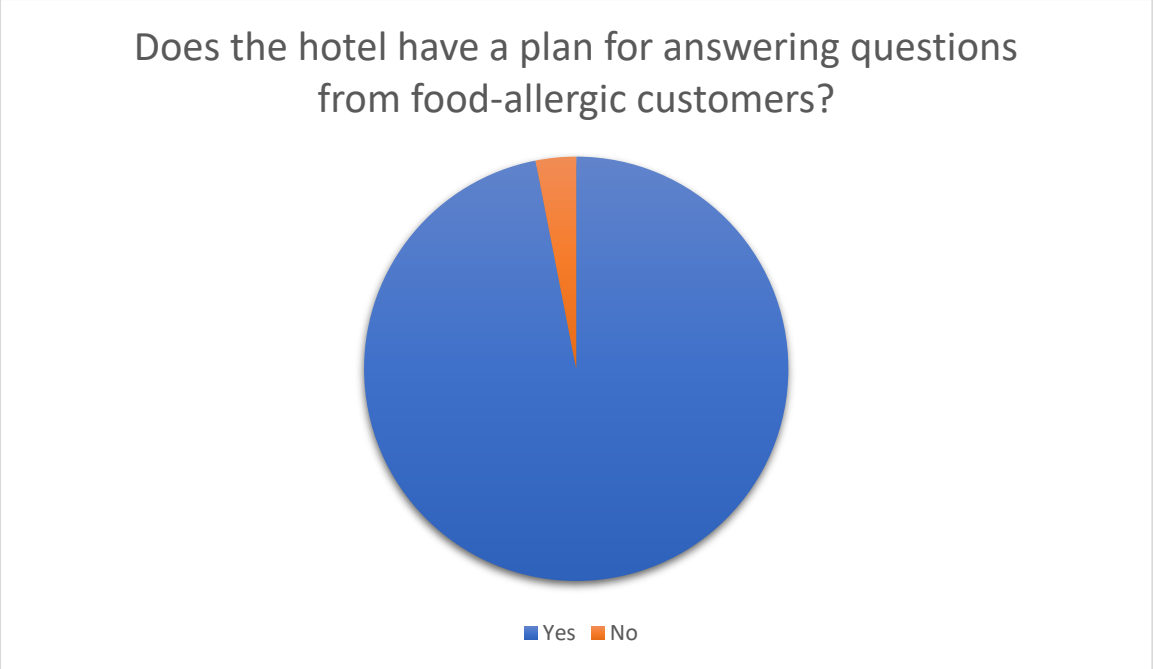


Figure 8: Plan to Answer Questions from Food-Allergic Customers

Another question was whether a specific employee is always on the job to handle customers' questions related to food allergy and related requests. 81.5% confirmed the presence of one such individual, while 18.5% answered that there is no specific person typically on duty to handle such questions and requests.

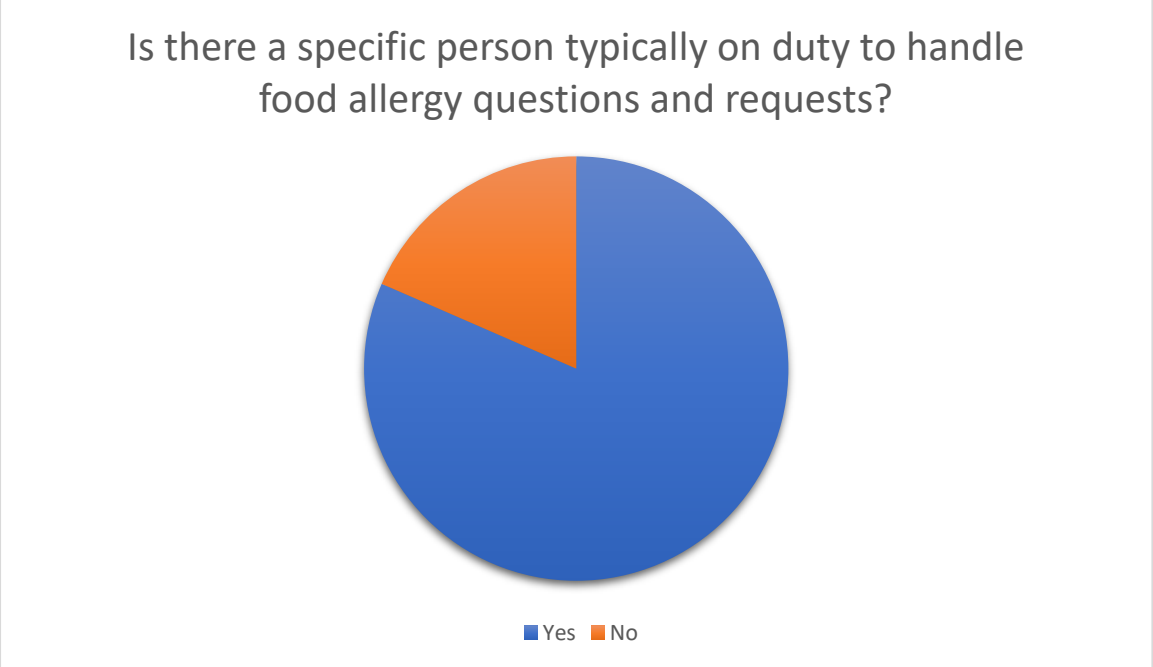


Figure 9: Specific Person to Handle Food Allergy Requests

When asked whether, in their opinion, the relevant hotel meets food-allergic customers' special requests, 90.8% replied in the positive. The other 9.2% who answered in the negative resulted as the same individuals who had declared that there was no plan for dealing with food-allergic customer. Furthermore, the same respondents, except for one, answered that there is no specific person on duty to handle food allergy questions and requests in their hotel at any given time. The same respondents also attested to the fact that they had not attended any training on food allergies, nor were provided with such forms of training by the hotel in question.

Figure 10: Food-Allergic Customer Special Requests

In a study conducted by the Health Specialists Network in USA, 70.8% (n=189) of the restaurants confirmed that a plan was in place to answer questions when asked by food-allergic customers. It was noted that those that had such plan had greater odds of having better food allergy knowledge (Radke T. , et al., 2016). The same study, however, shows that only 53.3% had a specific employee available to handle questions and requests related to food allergy. It was observed that the restaurants operating using this system had better chances of having a higher food allergy attitude score than did others who did not feature such an employee (Radke T. , et al., 2016).

Having both a plan and a specific employee to answer such requests are positively related to knowledge and attitudes concerning food allergen.

It may be concluded that where in local 5-star hotels a specific person is appointed to deal with allergy questions and requests, 35.8% successfully identified all major allergens and allergic reaction. Such practices are recommended to be part of the establishment's food allergy management plan (Radke T. , et al., 2016).

A Food Allergen Management Plan must be found in every food establishment. This explains the processes and policies for the control of food allergens within the establishment. A pertinent plan is subsequently developed, based on regulations and science in order to protect customers' health (Boye & Benrejeb Godefroy, 2011).

Kitchen staff knowledge about food allergies was further tested when members of staff were asked whether a person with a food allergy could safely consume small amounts of the food they are allergic to. 9.23% incorrectly believe this and answered yes. Here, a distinction is to be made between food allergies and food intolerance, as discussed earlier. Another question involved whether a meal where a food allergen is removed from a dish after it has been prepared is safe for a food-allergic customer. All respondents (100%) answered no.

An Environmental Health Specialists Network study shows that more than 11% of staff believed that allergic people can safely consume small amounts of the allergen. Another 10% marked their response as unsure or opted to skip the question (Radke T. , et al., 2016). The next question was answered accurately by all members of staff in 5-star hotels in Malta, in contrast to the respondents of the EHS study, who fared badly here. 5.2% of respondents in the latter study (n=35) incorrectly selected yes, meaning that it is safe for an allergic customer to eliminate the food allergen from a meal after it has been made. Another 2.4% were not sure or skipped the question.

Having such findings coming from local kitchen staff preparing food is worrisome. Communication between customers and staff is vital in order to prevent food allergies when dining out. Correct and accurate knowledge is critical for allergic customers (Radke T. , et al., 2016).

4.3.6 Food Allergy Emergency

Potential errors can occur during the process of food handling, from the ordering stage through to the preparation and delivery of food. For the purpose of this study, kitchen staff in a 5-star hotel were asked whether they had ever experienced a food allergy emergency while at work. 87.7% of the respondents answered no, while 12.3% (n=8) answered in the positive. This was followed by another question asking participants what action to take if a customer displays a severe food-allergic reaction. 3 options were given out to choose from: call 112; that is, the emergency number; ask the customer if they have medicine they could take or suggest that the customer regurgitate. The correct answer in this case is to dial the emergency number, which 46.1% answered correctly. 18.5% answered that they would ask the customer whether they had any medicine at hand. It should be noted that the majority of these respondents declared that they had not attended any related training. 35.4% of the respondents answered yes to the first two options. Rather encouragingly, no one stated that they would suggest that the customer regurgitate.

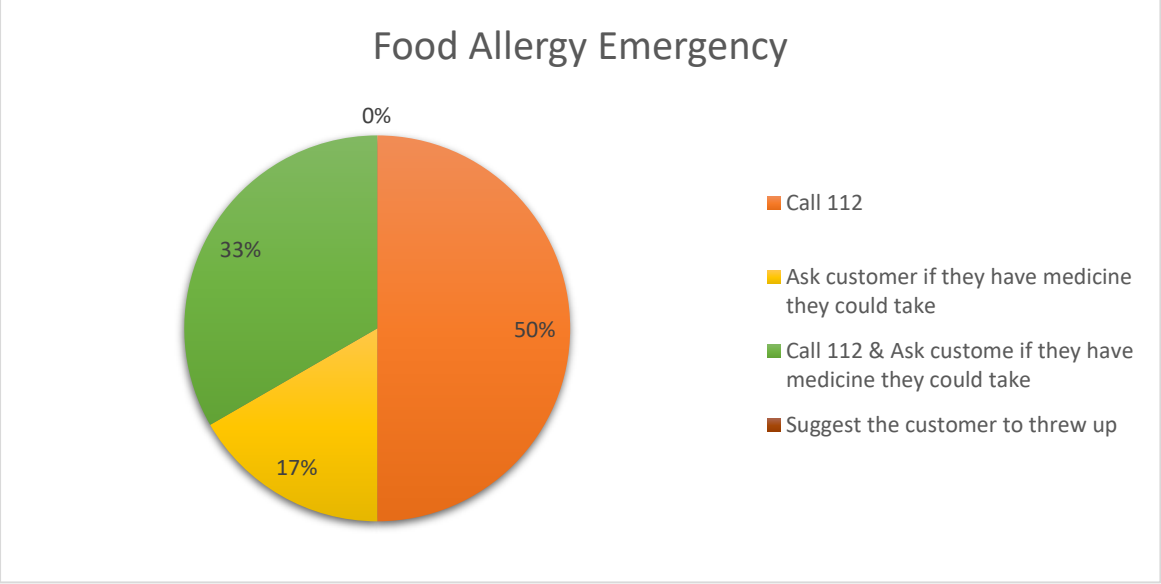


Figure 11: Food Allergy Emergency

In a study based in Turkey amongst five-star hotel kitchen staff, 67.8% strongly agreed and agreed that they believed they could manage a food allergy emergency situation

effectively at their workplace (Lokman & Akoglu, 2022). In an EHS-Net study conducted in restaurants in the USA, nearly all staff members knew that the emergency medical service number should be dialled in case of food allergy. In another study amongst 100 establishments in New York, 47% rated ‘very’ or ‘somewhat’ in reply to whether they would be able to manage a food allergy emergency (Ahuja & Sicherer, 2007).

4.4 Conclusion and Limitations

This study was based on the questionnaires distributed to 5-star hotels in Malta and Gozo. The majority have several years of experience compared to their role in the kitchen.

Also, it is to be noted that the majority of the respondents never experienced an allergy emergency while on duty, which demonstrates a lack of experience in this respect.

Chapter 5. Conclusion and Recommendations

5.1 Outcomes

Although allergies are of great health concern, it is to be noted that allergies are also important from a food safety point of view with respect to food handlers. This means that when food is prepared or consumed for its intended use, it will not cause any harm. Studies are continuously being carried out the world over on food safety and allergens in food (FAO & WHO, Codex Alimentarius, 2011). However, for the purpose of this study, the target participants were kitchen staff currently working in 5-star hotels in the Maltese islands. Through this study, food allergy knowledge, attitudes and practices of food handlers in 5-star hotels in Malta and Gozo were evaluated. The study only featured 5-star hotels in Malta and Gozo; hence, the results cannot be generalised to all local kitchen staff.

Compared to other studies conducted both locally and overseas, the outcomes based on this study are worrying. It is clear that many food-handling establishments, including 5-star hotels, are not prepared to fulfil the needs of food-allergic customers due to higher expenses related to specific ingredients, extra expenses to prepare food for allergic customers and labour turnover training, with many young employees seeking jobs as a temporary opportunity and other factors to consider. Hence, restaurants and hotels lack preparation for the serving of safe food to customers suffering from food allergies. According to Schembri, training provided by the employer shall be restricted to the work performed by that particular member of staff at the specific workplace (Schembri, 2017).

Another outcome of this study is that not all the staff members handling food ingredients possess sufficient knowledge to safely prepare food for customers with food allergies. Through this study it was found that staff working in 5-star hotels have average knowledge related to food allergies. Although many 5-star hotels in the Maltese islands offer training to their staff, there are still some staff members who handle food without any training. Hence, the findings show that the knowledge level of the kitchen staff in 5-star hotels in Malta and Gozo on food allergies is not up to standard as regulated by the legislation. This confirms the need for regular training

and interventions relating to food safety, as also highlighted in the studies already discussed.

Further to this, through this study it has been highlighted that not all 5-star hotels in Malta and Gozo are well equipped with adequate staff and resources to deal with guests' food allergies. Some hotels do not have specific employees at hand to deal with request and questions about allergies. Also, some 5-star hotels in Malta opt not to display any information related to allergies on the menu.

5.2 Limitations and Recommendations

Although the sampling method utilised reflected a variety of opinions amongst the kitchen staff in -star hotels, the sample itself was rather small.

Despite the fact that not all 5-star hotels in Malta and Gozo can be considered in the same manner, training for staff is of paramount importance for both current staff and newcomers. Every section of the industry related to food handling must emphasise strategies concerning training and education about food allergies. Food industries must make sure that kitchen staff possess a Food Handler's card, which is obtained by following a course including information about food allergens. Furthermore, training should be offered regularly by the employer for staff to understand the importance of customers' safety in relation to food allergies. The ultimate aim is to raise awareness in staff about risks which can be caused by allergic food. Through appropriate training, food handlers will increase their knowledge and be more responsible when dealing with food allergic guests.

One particular recommendation applies to allergenic customers, who play a significant role when eating food prepared by others. Communication with staff is vital, with their contribution to provide vital information about their allergies to staff proving necessary. Communication is the first step via which the kitchen staff preparing food can be alerted. Through knowledge, unwanted accidents can be avoided.

Future research should focus on miscommunication and explore errors which are more likely to occur resulting in food allergy accidents and whether training and good communication might decrease the incidence of such accidents. This should be based

on a larger scale and include more participants to reflect better practices related to food handling.

5.3 Concluding Remark

Malta is estimated at having 2% of adults and 8% of children suffering from food allergies (Carabott, 2% of adults and 8% of children suffer from food allergies, 2017). Added to this are the thousands of tourists visiting this country every year, of whom a percentage may suffer from food allergies, perhaps including some who opt to dine in 5-star hotels. Emphasising the latter is a step in the right direction towards promoting the managing of food allergens in the local food industry.

This study has contributed the above observations for the purpose of preventing allergic reaction-related accidents in food establishments. The possession of greater knowledge, improved efforts related to communication regarding allergens and enhanced management of food allergens will result in an enjoyable dining experience for the guest, as well as engendering greater satisfaction on the part of both consumer and members of staff in the quality of the latter's work.

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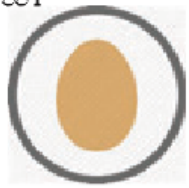
Appendices:

Appendix 1: Allergenic food ingredients and their distribution (Popov-Raljic, Aleksic, Jankovic, Blesic, & Ivkov, 2017)

Allergens and their reference doses (mg)	**Distribution and severity**	**Certain derivatives and food that contain allergens which can provoke allergic reactions**
Cereals that contain gluten *(wheat, rye, oats, barley, spelt, kamut and varieties obtained by crossing them, with the exception of: wheat based glucose syrup and dextrose,wheat maltodextrin, glucose syrups based on barley and cereal destilates or ethyl alcohol of agricultural origin for the production of strong alcoholic beverages obtained from cereals)*  **Reference dose = 1mg**	Celiac disease or gluten intolerance. Allergens from cereals can cross-react with pollen allergens.	✓ Flour ✓ Starch ✓ Bran ✓ Melba toast ✓ Bread, breadcrumbs ✓ Grits ✓ Cous-cous ✓ Hydrolysed vegetable protein protein povrća (if originates from wheat)
Eggs and egg products  **Reference dose = 0,03 mg**	Egg allergy is common with children, but more than a half of children outgrow this allergy by their third year of age. Some individuals may experience anaphylactic reactions	✓ Powdered eggs, dried eggs or pasteurized eggs ✓ Albumin ✓ Egg glaze ✓ Mayonnaise *Note: *Lysozyme (produced from eggs), which is used in wines, and albuminhave small chances of causing a reaction.However, when lysozyme is used for other purposes, it can cause unwanted reactions.*

Milk and dairy products including lactose *Except: whey used to produce destilates or ethyl alcohol of agricultural origin for strong alcoholic beverages, lactitol.*  **Reference dose = 0,1 mg**	Allergy to cow's milk is the most common allergy with younger children and it is present with 2-7% babies under one year of age. About 87% of children grow out of this allergy by their third year of age. There is a large degree of cross-reactivity between cow's milk and milk of other mammals, such as sheep, goats or buffalo.	✓ Whey ✓ Casein ✓ Milk powder ✓ Lactose ✓ Butter, cheese, creams, yoghurt
Crustaceans (crabs) and their products  **Reference dose = 1 mg**	Allergy to crabs is very common. People who are sensitive can react to different kinds of crustaceans. Crustaceans often cause severe reactions, and some people may react to vapour produced during cooking.	✓ Gastro-products made of crustaceans ✓ Salads ✓ Dippings ✓ Clear and thick soups
Shellfish and other mollusks and their products  **Reference dose is not determined**	Allergies to shellfish can cause reactions even in people who are sensitive to protein in fish products. Isolated protein which causes the stated reactions is called tropomyosin and it is contained in all shellfish, and/ or parvalbumin which is found in codfish. The research has shown that trpomyosin is a cross-reactive allergen both in crustaceans and mollusks	✓ Hot dishes made of shellfish and mollusks ✓ Salads ✓ Dippingd ✓ Clear and thick soups

Fishery products (codfish, shark, salmon, tuna) *With the exception of fish gelatin used as a carrier for vitamines, fish gelatin or isinglass for clarification of beer and wine*  **Reference dose = 0,1 mg**	Fish allergy is more common in adults than in children, but it can often be very severe and cause an anaphylactic shock. All major fish allergies can cross react in the sense of their allergenicity and no fish is safe for perople allergic to it.	✓ All kinds of fish ✓ Fish extracts ✓ Fish sauces ✓ Fish oils ✓ Worcester sauce ✓ Omega-3 oils *Note: *fish gelatin used for vitamins and flavours, and fish gelatine used in beer, wine and cider production have little chance of causing allergic reactions.*
Soy and soy products *With the exception of completely refined soybean oil and fat, natural mixtures with tocopherols (E306), natural D-alpha tocopherol acetate, D-alpha tocopherolsuccinate originated in soy, phytosterol and phytosterol esters isolated from soybean oil*  **Reference dose = 1 mg**	Allergy to soybeans is common in children, but they often grow out of it by the age of two. Adults are sometimes affected with this allergy. The symptoms are usually mild, and anaphylactic reactiona are very rare. An allergic cross-reactivity of soybeans and other legumes, including peanuts is possible, and there are reports on the cross-reactivity of soybeans and cow's milk.	✓ Soy flour ✓ Tofu from soybeans ✓ Soy protein isolates ✓ Soy protein concentrate ✓ Soybean formula for infants ✓ Soy sauce
Lupin and lupin products  **Reference dose = 4 mg**	Lupin, or lupine, is a genus in the legume family. Lupin flour is rich in protein, especially in lysine, an essential aminoacid.	✓ Bread ✓ Pastry ✓ Dippings ✓ Stews ✓ Pasta ✓ Meat products–sausages
Peanut and peanut products  **Reference dose = 0,2 mg**	A significant number of people allergic to peanutsare allergic to other nuts as well, and they also have an allergic cross-reaction with other legumes, such as soybeans and lupin. Thermal treatment, especially baking, increases the allergenicity of peanuts.	✓ Non-refined, cold-pressed peanut oil ✓ Peanut butter ✓ Peanut flour ✓ Different peanut protein products ✓ Refined peanut oil

Nuts: almonds, hazelnuts, walnuts, cashews, pecans, Brazilian nuts, pistachios, macadamia nuts and Queensland nuts and their products. *Except: nuts used in the production of destilates and ethyl alcohol of agricultural origin for strong alcoholic beverage*  **Reference dose = 0,1 mg**	Almonds, hazelnuts, walnuts, cashews, pecans, Brazilian nuts, pistachios, macadamia nuts and Queensland nuts and their products – are very common causes of allergies and they can cause anaphylactic reactions in people who are susceptible to allergies.	✓ Butter made of nuts ✓ Pralines (hazelnut) ✓ Marcipan ✓ Almonds paste ✓ Walnut oil ✓ Worcester sauce (some brands contain walnuts)
Celery and celery products  **Reference dose = not determined**	Celery is a common cause of allergies in Europe. The symptoms range from mild to severe (anaphylaxis). In Germany, 2.5% of population suffer from this form of food allergy, whereas it is not common in Great Britain.	✓ Celery powder ✓ Celery seeds *Note:*celery leaves and seed oil most commonly do not cause allergic reactions.*
Mustard and mustard products  **Reference dose = 0,05 mg**	Mustard allergy is not common in Great Britain, however, it is common in France, where severe reactions, incuding anaphylaxix, have been reported.	✓ Mustard paste ✓ Mustard seed ✓ Mustard leaves ✓ Mustard flour ✓ Mustard powder *Note: *mustard oil and mustard seed oil most commonly do not cause allergic reactions.*
Sesame seed and sesame products  **Reference dose = 0,2 mg**	Sesame allergy is most pronounced among inhabitants of Israel, and it is increasingly common in Great Britain as well and it can cause severe reactions including anaphylaxis. There is a cross-reactivity between nuts and sesame seeds.	✓ Sesame seed ✓ Sesame oil ✓ Sesame paste ✓ Tahini ✓ Hummus ✓ Halvah

Sulfur – dioxide and sulfites  ***over 10mg/kg or 10 mg/l expressed as SO2**	Supplements of sulfites in wines are associated with causing asthmatic reaction in sensitive individuals, most commonly people who suffer from asthma. Symptoms can be severe with a minority of people suffering from asthma.	✓ E220 sulfur dioxide ✓ E221 sodiumsulfite ✓ E222 sodium bisulfite ✓ E223 sodium metabisulfite ✓ E224 potassium metabisulfite ✓ E226 calcium sulfite ✓ E227 calcium bisulfite ✓ E228 potassium bisulfite *Sulfur dioxide and sulfites are used as preservatives – dried fruit and vegetables, non-alcoholic beverages, fruit juices, fermented beverages such as wine, beer, ciders, sausages and burgers.*

Appendix 2: Allergenic Food Database
http://research.bmh.manchester.ac.uk/informall/allergenic-foods/

1	Abalone, perlemoen
2	Acerola
3	Alaska Pollock
4	Almond
5	Aniseed
6	Apple
7	Apricot
8	Avocado
9	Banana
10	Barley
11	Bell pepper
12	Brazil nut
13	Buckwheat
14	Cabbage
15	Camomile
16	Carp
17	Carrot
18	Cashew
19	Castor bean
20	Celery, Celeriac
21	Cherry
22	Chestnut
23	Chickpea, garbanzo, bengal gram
24	Cocoa
25	Coconut
26	Cod
27	Cotton seed
28	Courgette, zucchini
29	Crab
30	Date
31	Egg (hen's egg)
32	Fig
33	Fish
34	Flax seed, linseed
35	Frog, edible
36	Garden plum
37	Garlic
38	Grape
39	Hazelnut
40	Kiwi fruit; chinese gooseberry
41	Lentil

42	Lettuce
43	Lobster
44	Lupin or Lupine
45	Lychee
46	Mackerel
47	Maize, corn
48	Mango
49	Melon
50	Milk, cow
51	Mustard
52	Oat
53	Oyster
54	Peach
55	Peanut; ground nuts; monkey nuts
56	Pear
57	Pecan
58	Persimmon
59	Pine nuts
60	Pineapple
61	Pomegranate
62	Poppy seed
63	Potato
64	Pumpkin
65	Rice
66	Rye
67	Salmon
68	Sesame
69	Shrimp, black tiger shrimp
70	Shrimp, brown shrimp
71	Shrimp, greasyback shrimp
72	Shrimp, Indian prawn
73	Shrimp, Neptune rose shrimp
74	Shrimp, white shrimp
75	Snail
76	Soybean, Soya
77	Squid
78	Strawberry
79	Sunflower seed
80	Tomato
81	Tuna
82	Turnip
83	Walnut
84	Wheat (breadmaking wheat, pasta wheat, Kamut, spelt)

Appendix 3: List of Allergens as per Annex II of EU Regulation 1169/2011

SUBSTANCES OR PRODUCTS CAUSING ALLERGIES OR INTOLERANCES

1. Cereals containing gluten, namely: wheat, rye, barley, oats, spelt, kamut or their hybridised strains, and products thereof, except:

(a) wheat based glucose syrups including dextrose [(1)];

(b) wheat based maltodextrins [(1)];

(c) glucose syrups based on barley;

(d) cereals used for making alcoholic distillates including ethyl alcohol of agricultural origin;

2. Crustaceans and products thereof;

3. Eggs and products thereof;

4. Fish and products thereof, except:

(a) fish gelatine used as carrier for vitamin or carotenoid preparations;

(b) fish gelatine or Isinglass used as fining agent in beer and wine;

5. Peanuts and products thereof;

6. Soybeans and products thereof, except:

(a) fully refined soybean oil and fat [(1)];

(b) natural mixed tocopherols (E306), natural D-alpha tocopherol, natural D-alpha tocopherol acetate, and natural D-alpha tocopherol succinate from soybean sources;

(c) vegetable oils derived phytosterols and phytosterol esters from soybean sources;

(d) plant stanol ester produced from vegetable oil sterols from soybean sources;

7. Milk and products thereof (including lactose), except:

(a) whey used for making alcoholic distillates including ethyl alcohol of agricultural origin;

(b) lactitol;

8. Nuts, namely: almonds (Amygdalus communis L.), hazelnuts (Corylus avellana), walnuts (Juglans regia), cashews (Anacardium occidentale), pecan nuts (Carya illinoinensis (Wangenh.) K. Koch), Brazil nuts (Bertholletia excelsa), pistachio nuts (Pistacia vera), macadamia or Queensland nuts (Macadamia ternifolia), and products thereof, except for nuts used for making alcoholic distillates including ethyl alcohol of agricultural origin;

9. Celery and products thereof;

10. Mustard and products thereof;

11. Sesame seeds and products thereof;

12. Sulphur dioxide and sulphites at concentrations of more than 10 mg/kg or 10 mg/litre in terms of the total SO 2 which are to be calculated for products as proposed ready for consumption or as reconstituted according to the instructions of the manufacturers;

13. Lupin and products thereof;

14. Molluscs and products thereof.

Appendix 4: Food Allergens Training

Benefits of this Training

- Understanding the effects of Food Allergens and Food Intolerance
- Knowing how to apply changes to European legislation
- Providing Responsible Service towards clients
- Knowing what to do in case of an Allergic reaction
- Learning the Big 14 Allergens

Course Content

1. What are Food Allergens and Food Intolerance?
2. What are the symptoms of an allergic reaction?
3. Legislative changes in Europe
4. What must you do?
5. Types of Food Allergens and Intolerances
6. Responsible service towards clients
7. What to do in case of an allergic reaction?

What is meant by the term Food Allergen?

Food Allergen is a potentially serious immune response to eating or otherwise coming into contact with certain foods or food additives.

An allergy occurs when the immune system:

- Identifies a food protein as dangerous and creates antibodies against it; and
- Tries to protect the body against the danger by releasing substances, such as histamine into our blood when that food is eaten.
- A higher % of children have food allergies than adults, because their immune systems are not yet fully developed

Allergic reactions to food can cause serious illness or even death

What happens with Food Allergens?

An adverse reaction to a food or food ingredient that involves the immune system

- Symptoms can appear within minutes, or up to several hours after the person has eaten the food they are allergic to
- Potentially life threatening condition
- Need to avoid the food which makes them ill

The impact of a Food Allergy

The symptoms can include:

- rashes (usually very itchy)
- tingling sensation in the mouth
- swelling of the lips, tongue, face and throat
- difficulty breathing
- diarrhoea
- vomiting
- abdominal cramps
- and on rare occasions anaphylaxis

What is meant by the term Food Intolerance?

Most food intolerances do not involve the immune system and are generally not life-threatening

However, they can make someone feel very ill or affect their long-term health

Examples include Lactose and Gluten intolerance

Symptoms include:

– skin problems i.e. eczema
– diarrhoea
– weight loss
– bloating
– anaemia

Legislative Changes in Europe

Food labelling is changing

- Moving from General Labelling Regulation (2000/13/EC) to Food Information for Consumers Regulation (1169/2011/EC)
- From **13 December 2014** new rules on allergen labelling shall apply to all food businesses in Europe
- Existing requirements for pre-packed foods are retained – but new requirement to **emphasize** allergenic foods in the ingredients list
- Introduction of **new requirement to provide allergy information for unpackaged foods**

How does this effect us?

1. As of **13th December** in Europe, we will be legally obliged to provide accurate information to our customers (internal and external) about the food they are served;
2. We will have a legal duty (Criminal and Civil) to advise all customers what allergens exist within the foods that we serve;
3. The information we provide must be 100% accurate, all of the time.

EU FIC (Food Information Council) Labelling

- You will see old and new labelling for a period of time, as food placed on the market before 13 December 2014 may have a long shelf life
- What EU FIC compliant labelling could look like?

INGREDIENTS: Water, Carrots, Onions, Red Lentils (4.5%) Potatoes, Cauliflower, Leeks, Peas, Cornflour, **Wheat**flour, Salt, **Cream**, Yeast Extract, Concentrated Tomato Paste, Garlic, Sugar, **Celery** Seed, Vegetable Oil (sunflower), Herb and Spice, White Pepper, Parsley.

Allergen Labelling [for non-prepacked food] (Article 44)

1. Allergen ingredients information to be provided for all foods that we serve
2. The provision of the information about allergenic ingredients is **mandatory**
3. Oral provision also permitted, provided the business indicates clearly that such information can be obtained upon request

Allergy advice

Oral Information

Oral information must be **accurate**, **consistent** and **verifiable** upon challenge

- What is consistent? Is there a process in place to enable consistent information to be provided? All food handlers must be trained but it can be helpful to refer specific queries to the nominated person(s) – *Allergen Communicators*
- What is verifiable? Ingredients information on recipes, charts etc.

Allergy advice

Accessible information

1. Information on allergenic ingredients must be either written up front (for example on a menu or menu board) without the customer having to ask for information i.e. ⚠ *Chicken Tikka Masala – Contains: milk, almonds (nuts);*
2. Sign-posted to where written information can be found
3. Sign-posted to say that oral information can be obtained from an order-taker and identify specific *"Allergen Communicators"*

If information on allergenic ingredients is provided orally, this must be consistent and verifiable (i.e. a business must have processes in place to capture information from recipes or ingredients lists from products bought in, and to make this available)

Communications is Key

Think about the chain of communication

- The person buying the food
- The person handling the food
- The person taking the order
- The person ordering the food
- And Food donations!

Allergy advice

Cross Contamination can Kill

Storage of food

Allergens generating dust

Dual use of equipment

Use of oil

Use of serving utensils

Purchasing of products

Regular reviews and keep it current

Food businesses need to have processes in place to ensure the information they provide is accurate all of the time

- HACCP team to regularly review the ingredients information and update Allergens
- Where ingredients change, review the accuracy of the recipe and communications
- Accuracy is dependent on the information on labelling, updating allergen information for dishes, updating staff and consumers
- Regular training for all food handlers
- Avoid cross contamination

Guesswork!

- **DO NOT** put someone's life at risk
- If you are not sure **ASK**
- Do not **GUESS**
- It could result in **LIFE** or **DEATH**

Safe method:

Food allergies

It is important to know what to do if you serve a customer who has a food allergy, because these allergies can be life-threatening.

Safety point	Why?
If someone asks if a dish contains a certain food, check **all** the ingredients in the dish (and what they contain), as well as what you use to cook the dish, thicken a sauce and to make a garnish or salad dressing. **Never guess**. A customer may also give you a 'chef card' listing the foods that they are sensitive to.	If someone has a severe allergy, they can react to even a tiny amount of the food they are sensitive to. You can find out more about allergies at **food.gov.uk/safeeating/allergyintol/guide/**
Keep a copy of the ingredient information of any ready-made foods you use.	This is so you can check what is in them.
When you have been asked to prepare a dish that does not contain a certain food, make sure work surfaces and equipment have been thoroughly cleaned first. Make sure staff wash their hands thoroughly before preparing the dish.	This is to prevent small amounts of the food that a person is allergic to getting into the dish accidentally.
Give detailed information in the name or description of dishes on the menu, especially if they include the foods listed over the page, e.g. chocolate and almond slice, sesame oil dressing. Remember to update the menu when recipes change.	This allows people with food allergies to spot that dishes contain certain foods.
 	

1. How do you check if food does not contain a particular ingredient?
2. How do you prepare food for someone with a food allergy?
3. How are dietary requests communicated from front to back of house?
4. Are you making specific claims i.e. gluten-free (20 PPM or less of gluten). How this claim is verified or validated? Unless pre-packaged, a "no gluten containing ingredients" (NGCI) statement would be better

Common Foods Containing Peanuts or Tree Nuts

- Peanuts can be found in biscuits, cakes, cheese, curries, ice-cream desserts and sauces such as for satay .
- It is also found in groundnut oil and peanut flour

- Tree Nuts include almonds, hazelnuts, walnuts, cashews, pecan nuts, Brazil nuts, pistachio nuts, macadamia or Queensland nuts .
- These can be found in breads, biscuits, crackers, desserts, ice cream, marzipan (almond paste), praline and frangipane, nut oils and sauces, cereal bars and confectionary, salads ad salad dressing. Vegetarian products such as veggie burgers;

- Ground, crushed or flaked almonds are often used in Asian dishes such as curries or stir fries.

Sesame Seed Allergy

A small but significant number of people are severely allergic to sesame seeds

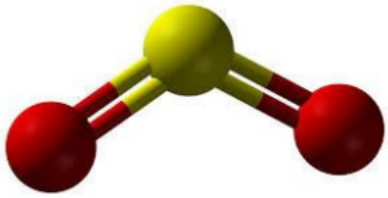
TOTAL AVOIDANCE is essential

Dishes containing sesame include:

- Sesame oil
- Tahini and hummus
- Chinese stir-fry oils some times contain sesame oil
- Bread and bread sticks

Sulphur Dioxides & Sulphites

Sulphites are chemicals widely used as preservatives in foods, beverages and medicines. Often used as a preservative in dried fruit, meat products, soft drinks and vegetables as well as in wine and beer.



Egg Allergy

Symptoms of egg allergy usually appear within minutes up to two hours of eating eggs or food containing egg ingredients.

Symptoms may include:

- Skin reactions, such as hives or eczema
- Allergic conjunctivitis (red, watery eyes)
- Gastrointestinal reactions, such as nausea, abdominal pain, vomiting, or diarrhea
- Airway symptoms, such as wheezing, coughing, or runny nose
- Angioedema (swelling of lips, tongue, or face)

Usually mild but some cases can trigger Anaphylaxis

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Egg Allergy - Food containing eggs

- Aioli
- Baked goods – Bread, cakes, rolls, scones, croissants, etc.
- Béarnaise sauce
- Breaded foods (often dipped in eggs before dipping in breadcrumbs)
- Custard
- Canned soup
- Casseroles
- Energy bars
- Hollandaise sauce
- Ice cream
- Fresh pasta
- Some meat products
- Malted beverages

- Mayonnaise
- Meringue
- Protein shakes or liquid meal substitutes
- Protein powders
- Pudding
- Quiche
- Salad dressing
- Sauces
- Tartar sauce
- Meatballs or meatloaf
- Rémoulade

- Don't forget foods glazed with eggs!

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Milk - Lactose Intolerance

Lactose is the name of a type of sugar that is naturally found in Cows milk.

Causes abdominal symptoms such as bloating and diahorrea

Found in :

- Products derived from milk i.e. butter, dairy cream, cheese, yoghurts, milk powders
- Foods containing these products. (biscuits made with a portion of butter -a sauce prepared in the same way)
- It is often used in foods glazed with milk, powdered soups and sauces
- Whey, Whey powder, Whey solids, Casein, Caseinates, Non-milk fat
- Vegetarian cheese

Oats or Soya and Soya based yoghurts can be used instead

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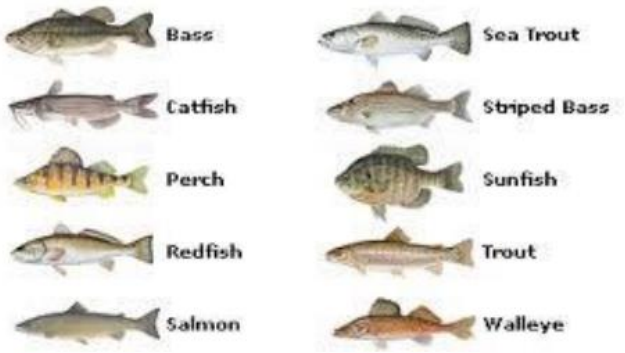
Fish & Fish Products

Fish and fish products such as anchovies that are commonly used in salad dressings, sauces, relishes and also commonly used as pizza toppings.

Often found in some fish sauces, relishes, salad dressings, stock cubes and in Worcestershire sauce.



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Crustaceans

This includes crabs, lobster, prawns and scampi.

Shrimp paste and oyster sauce are also found in many Chinese & Thai dishes

Molluscs

This includes mussels, land snails, squid and whelks . It is often found in oyster sauce or as an ingredient in fish stews

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Soya Beans

Soya beans may be found as tofu, bean curd, edamame beans, miso paste, textured soya protein, soya flour or tofu.

It is often used in some desserts, ice cream, meat products, sauces and vegetarian products

Lupin Flour

Lupin is sometimes labelled as lupine, lupin flour, lupin seed or lupin bean. Lupin allergy can cause severe reactions, including anaphylaxis. Lupin can be found in European bakery products include pastry cases, pies, waffles, pancakes, crepes, products containing crumb, pizzas, and deep-coated vegetables such as onion rings.

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Mustard

Mustard allergies are very common.

This includes liquid mustard, mustard powder and mustard seeds.

It is often found in breads, curries, marinades, meat products, salad dressing, sauces and soups.

Celery & Celeriac

Celery can provoke the most severe allergic reactions; for people with celery allergy, exposure can cause potentially fatal anaphylactic shock. Celery root—commonly eaten as celeriac, or put into drinks—is known to contain more allergen than the stalk.

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Common Food Intolerance

Types of Food Intolerance

- Lactose Intolerance
- Gluten Intolerance
- Food Additives: as MSG (mono sodium glutamate) and Sulfites

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Coeliac disease/ Gluten Intolerance

- Coeliac disease occurring in sensitive individuals upon the consumption of wheat, rye, barley, triticale, spelt, and kamut.
- Characterized by diarrhea, bloating, weight loss, anemia, bone pain, chronic fatigue, weakness, muscle cramps

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Gluten Intolerance

FOODS TO BE AVOIDED

A Coeliac **must not** consume foods or beverages that contain any form of wheat, rye, barley and/or oats.

This typically includes:

- bread, rolls, buns, crisp bread
- biscuits, cakes, pastry
- pasta
- breadcrumbs
- sausages, minced and tinned meats containing flour
- made-up dishes containing flour
- baking powder
- soup, sauces and gravies containing flour
- some breakfast cereals
- semolina, couscous, Tabbouleh
- soy sauce
- pearl barley
- modified starch
- malt vinegar and extracts
- mustard powder
- miso
- foods cooked in batter
- beer and lagers

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Naturally Gluten-free

The following are **naturally gluten-free**:

- Ground rice
- Rice flour, Corn flour, Maize flour, Potato flour, Soya flour
- Arrowroot
- Rice
- Sago
- Tapioca
- Sweet corn
- Buckwheat
- Apple cider vinegar, balsamic vinegar
- Honey
- Eggs
- Fresh fish
- Tofu-soya
- Polenta
- Plain unflavored yogurt

There are also increasing ranges of specially manufactured products that are gluten-free

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Gluten Labeling

- Unless food is produced outside as Gluten Free. **Do not state** 'Gluten Free' on any menu, event documentation or contract.
- In order for a dish to be Gluten-free is must contain <20ppm of Gluten – could you tell?
- Dishes should be stated as "Containing No Gluten Ingredients"

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Gluten Intolerance

AVOID :

- Using breadcrumbs to dust meat
- Using flour to dust fish or poultry before cooking
- Contact with or use of sauces and gravies thickened with flour or any batter
- Cross contamination during preparation
- Contaminated equipment

Emergency Response

If a customer becomes ill, it is likely that the person, or someone with them, will state that they are suffering from an allergic reaction.
They may use the word ANAPHYLAXIS this is what to do:

- Immediately have someone call the emergency medical services (112) giving the following information:

This is an emergency. A customer has collapsed and we believe they are suffering from Anaphylaxis (pronounced ANA-FILL-AXIS)

- Person may carry an adrenaline injection or Epipen which can be used
  - In an emergency an Epipen belonging to another person could be used
- Lay patient down and raise legs

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Epipen

Epinephrine™ counteracts the symptoms of anaphylaxis, by constricting the blood vessels and opening the airways. The down side is that its effects last only 10 to 20 minutes per injection, it has some potentially serious side effects, and it must be administered correctly at or before the onset of symptoms to be effective.

Always call the Emergency Services

- Often carried by persons who have known allergies
- Used by injecting an adrenaline solution into the muscle (NOT INTO VEIN OR ARTERY)
- Instructions are on side of unit
- It needs to be used as soon as possible, remember that a person can die within 10 minutes

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Responsible Service
Do's and Don't

You Must

✓Provide allergen information to a customer when asked

✓Obtain accurate information about the allergen content of a product.

✓Remember products can become inadvertently contaminated

✓Wash hands and surfaces after handling an allergen

You Must Not

xGuess about a particular food item.

xAssume you know what is in a food item.

xTell the customer that you are unable to assist.

xMove warning notices from a counter or fail to display them.

xRemove labels on packaged items

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Appendix 5: Questionnaire

Survey on Food Allergies Management in 5-star Hotels – Kitchen Staff

I would like to invite you to participate in a survey about food allergies management in 5-star hotels in Malta for my thesis as part of my B.A(Hons) Culinary Arts studies.

Food Allergen is a potentially serious immune response to eating or otherwise coming into contact with certain foods or food additives. The survey is about how food allergies management is handled by kitchen staff in 5-star hotels in Malta.

Please read all the questions carefully and answer all questions.

Gender:

□ Male

□ Female

Age:

□ -18

□ 19-24

□ 25-29

□ 30-35

□ 36-40

□ 40+

What is your role in the kitchen?

□ Executive Chef

□ Head Chef

□ Sous Chef

□ Chef de Partie

□ Commis Chef

□ Kitchen Porter

□ Escuelerie (Dishwasher)

How long have you been working in a 5-stars hotel?

□ Less than 1 year

□ 1-2 years

□ 2-3 years

□ 3-4 years

□ more than 5 years Number of Years: _____

Have you received food allergy training?

□ Yes

□ No

If Yes, was training provided by the hotel?

□ Yes

□ No

Of the following foods, which do you think are major allergens?

□ Peanuts,

□ Tomatoes,

□ Milk or dairy,

□ strawberries,

□ shellfish,

□ eggs,

□ chocolates

Which of the following are symptoms of an allergic reaction?

□ Trouble breathing,

□ hives or rash,

□ headache

□ swelling of tongue and throat

□ fever

Someone with a food allergy can safely eat small amounts of the food they are allergic to?

□ Yes

□ No

Taken a food allergen out of a meal after it has been made is one way to make it safe for a food allergic customer?

□ Yes

□ No

Does the hotel have plan for answering questions from food allergic customers?

□ Yes

□ No

Is there a specific person typically on duty to handle food allergy questions and requests?

□ Yes

□ No

Does the menu show anything about allergens?

□ Yes

□ No

In your opinion, is communication well-handled between the servers and the kitchen staff?

□ Yes

□ No

Do you think that your hotel meets food allergic customer' special requests?

□ Yes

□ No

Have you ever experienced a food allergic emergency?

□ Yes

□ No

Which of the following should you do if a customer is having a bad food allergic reaction?

□ Call 112

□ Ask the customer if they have medicine they could take

□ suggest that the customer threw up

Kitchen staff should be knowledgeable about food allergies.

□ Agree

□ Unsure

□ Disagree